Case Study:

Efficient Intervention-less Completion Using The Inter Remote Bypass Valve

Date: *Jan 2023*
Region: *Australia*

Product Capabilities

- Allows standard completion operations such as circulating, pressure testing, packer setting, etc.) to be completed in the first phase, then closes through pre-determined pressure cycling to become an ISO14310 V0 rated barrier.
- Leaves a full-bore ID after being permanently opened - which can help to maximise production and simplify future intervention.
- Designed to withstand extreme bidirectional pressure loads and temperatures up to 10 200 psi and 170°C.
- Debris tolerant pressure cycling mechanism.

Challenge

A major operator in Australia requested a cost-effective solution for the recent completion of a well in a new development field. Two suspension barriers were required to enable removal of the blow out preventer (BOP) and installation of the vertical xmas tree (VXT). The primary barrier was the tested well architecture, including an unperforated liner, whilst the secondary tubing barrier would be an installed suspension plug below the tubing hanger.

Installation of a shallow barrier requires well intervention after the upper completion is installed, then further intervention to remove the suspension plug after the VXT is installed and tested. This results in surplus rig time, unnecessary intervention, and additional personnel exposure whilst rigging up and testing Process Control Equipment (PCE) at surface.

Solution

Interwell provided an Inter Remote Bypass Valve (IRBV). This was integrated and run with the completion, negating the need for a temporary suspension barrier during the installation phase. Pre-determined/tailored pressure cycling limits that initiate the closing of the valve were integrated seamlessly into the operation sequence, not only simplifying operations but creating a barrier at the same time.

The IRBV was installed with the bypass ports in the open position, which enabled the completion to be deployed, set and tested whilst retaining the capability of killing the Well through bull heading if required.

In the open position, the IRBV facilitated self-filling of the tubing string without surging or swabbing. This is due to the large bypass flow area. This flow area also ensured maximum circulating capabilities when circulating the underbalance cushion into the tubing after the completion was landed. Then the production packer was set and tested through the IRBV. Once complete, the pre-defined number of closing pressure cycles were performed and the IRBV shifted to the closed position providing an ISO14310 V0 bi-directional barrier. Following this, the IRBV was then inflow tested using the u-tube created from circulating in the underbalance cushion, enabling BOP removal and subsequent installation of the VXT.

Once the VXT was installed and pressure tested, the IRBV was then permanently opened by completing the pre-determined number of opening pressure cycles with zero well intervention. Once opened, a full-bore ID exists through the IRBV which helps to maximise production and simplify future intervention.

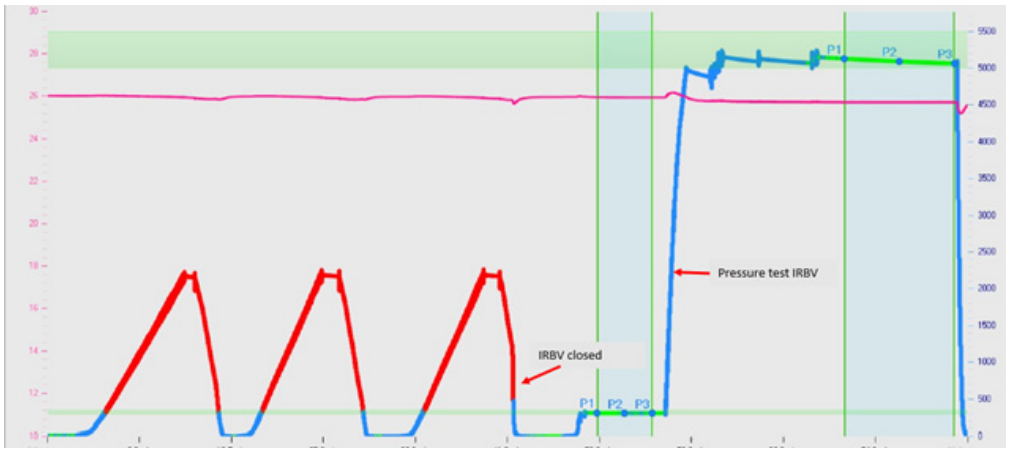

Fig.1 Graph showing the closing cycles

interwell

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Key Achievements

- Zero well intervention time (Wireline, Coiled tubing, DP, etc.).
- No personnel exposure due to associated intervention operations.
- Zero non-productive time.

Value Created

The use of the IRBV negated the need for well intervention to install, then subsequently remove, a temporary suspension barrier plug during completion operations, which would have required 2 separate rig ups. This saved around 24 hours of critical path rig time, intervention operations and personnel exposure associated with the intervention operations.

The collaboration between Interwell, the customer and the service companies facilitated the successful completion of the well with zero non-productive time related to the IRBV.

The debris tolerant IRBV pressure cycling mechanism worked as designed, providing a robust and reliable solution to remotely activate a tubing barrier and then permanently open it when needed.

Fig.2. Graph showing the Opening Cycles

interwell