

Case Study:

Intelligent Barrier Valve (IBV) Remotely Opens After 1 Year to Resume Production from a Lower Producing Zone

Date: Aug 2023
Region: North Sea, UK



Key Capabilities

- ISO 14310 Vo qualified
- Best in market flow area
- Debris tolerant
- Extensive battery life

Challenge

A major North Sea operator wanted to isolate a lower producing zone in a subsea well from a Light Well Intervention Vessel (LWIV) to enable them to perforate and produce from an upper zone.

The lower zone was to be isolated for a duration of one year to mitigate crossflow into the upper zone with its higher pressure. After one year, the pressure between the upper and lower zone was expected to equalise.

The operator was looking for a solution to isolate the lower zone, and after 1 year, resume production from the zone without the need for any intervention.

The solution had to pass through a 2.880" restriction ID, set in 3.5" – 9.2# tubing and withstand 772psi of differential pressure at a temperature of 50°C.

Solution

Interwell proposed a 270-350 (2.70" OD for 3.50" tubing) High Pressure High Temperature (HPHT) Retrievable Packer with 2.25" OD Intelligent Barrier Valve (IBV).

The 270-350 HPHT Bridge Plug has been ISO 14310 validation grade Vo qualified to 5,000psi differential pressure in a temperature range of 135-10°C in 3.5" – 9.2# tubing thus far.

The IBV is a programmable, intelligent valve that can be repeatedly opened and closed remotely. Deployed below a bridge plug or packer, the IBV can be used as a downhole barrier or flow control device. The IBV has a best in market flow area, activation flexibility (pressure, time, hydrostatic, temperature, timers, or combinations) and an extensive battery life.

The IBV has been qualified in accordance with ISO 14310 validation grade Vo to 7,500psi differential pressure in a temperature range of 150-4°C.

The IBV was to be run and installed in the closed position to isolate the lower zone and programmed to move to the open position after one year, to resume production from the lower zone.

The HPHT Retrievable Packer and IBV were deployed on e-line with tractor to a depth of 2,920m MD and set with real-time activation using our Electronic Setting Tool (EST) in August 2022. One year later, the IBV moved to the open position to resume production from the lower zone.

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Value

This solution allowed the operator to isolate a lower zone, and after one year, resume production from the zone without the need for any intervention. This was particularly advantageous with this being a subsea well and a further LWIV visit was not required. Post intervention, the operator saw a significant increase in production, and overall, the intervention was a success.

