

Case Study:

UK First for Interwell's Iconic Digital Transponder (iDT) Acoustic Downhole Monitoring System

Date: January 2024
Region: UK North Sea



Key Capabilities

- Reliable & Robust Barrier Verification
- Acoustic Downhole Monitoring System
- Pressure Rating: 15,000psi
- Temperature Rating: 150°C
- Extensive Battery Life: Up to 10 years
- Two-Way Communication

Challenge

A major North Sea operator planned to install two shallow-set retrievable bridge plugs in close proximity in 4-1/2" tubing on slickline to temporarily suspend a well for scheduled Xmas tree repair work to the Lower Master Valve (LMV).

Due to the close proximity, and the small volume between the barriers, it would be difficult to confirm the integrity of the upper barrier during pressure testing with an already established barrier below.

The operator was looking for a solution that would allow the integrity of the upper barrier to be verified to ensure that they had a dual barrier in place prior to commencing the repair work.

Solution

Interwell proposed the 342-450 (3.43" OD for 4.5" tubing) Medium Expansion (ME) Retrievable Bridge Plug (RBP) with Iconic Digital Transponder (iDT) acoustic downhole monitoring system.

The 342-450 ME RBP is ISO 14310 validation grade Vo qualified to 5,000psi differential pressure in a temperature range of 4-150°C in 4-1/2" tubing.

The Iconic downhole monitoring system consists of an iDT that is hung below a barrier. The iDT sends pressure and temperature data via acoustic transmission through the anchoring slips and up the tubing/casing to a current range of 100m (328ft). The data can then be received by a Wireline Adaptor or an Iconic Topside Transponder (iTt) and Iconic Topside Controller (iTc).

The Wireline Adaptor is typically run above the bridge plug setting tool and receives pressure and temperature data from the iDT which can be monitored real-time at surface on e-line or stored in memory and downloaded when Pull Out Of Hole (POOH) to surface.

The iTt is installed on a dry Xmas tree and receives the pressure and temperature data from the iDT that is displayed on the iTc.

The Iconic downhole monitoring system has a 15,000psi pressure rating, 150°C temperature rating, a battery life of up to 10 years and features two-way communication.

For this application on slickline, the iDT would transmit data to the Wireline Adaptor above the 2.70" Electronic Setting Tool (EST). The data would be stored in memory and downloaded when POOH to surface.

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Value

The lower 342-450 ME RBP was set at a depth of 285ft and successfully pressure tested to 300/2,000psi for 5/10mins. The upper 342-450 ME RBP complete with iDT was set at a depth of 203ft and successfully pressure tested to 300/3,000psi for 5/10mins whilst the iDT sent pressure and temperature data below to the Wireline Adaptor above.

The Bottom Hole Assembly (BHA) was POOH to surface and the data was downloaded from the Wireline Adaptor. The data was analysed and there was no change in pressure between the two barriers during the pressure test, confirming barrier integrity. Upon confirmation, a report was shared with the operator to provide documented verification of the barrier's integrity. With a dual barrier in place, Xmas tree repair work to the LWV could be safely carried out.

