



Re-establishing Reservoir Isolation during Deepwater US GoM RLWI with the BVS

Date: May 2021

Region: United States, Gulf of Mexico



Benefits

- Wireless pressure and temperature data transmission from the BVS
- Real-time mechanical verification with our surface powered EST
- Operational flexibility provided by the proven and reliable ME Bridge Plugs
- Remotely operated with web-based support

Challenge

Due to rising tubing pressure in a previously suspended deep-water subsea producer in the US GoM, the operator required remedial barriers to restore reservoir isolation. Initially, a plug & prong was installed in an R-Nipple to isolate the reservoir pressure from a tubing to annulus leak. With a known tubing leak, as well as communication between the A and B annuli, a challenging pressure test was performed against the plug assembly using downhole pressure gauges installed in the upper completion. Less than 6 months later, tubing pressure was increasing at a rate of < 10 psi/day, indicating reservoir pressure was leaking past the plug & prong barrier.

Solution

The isolation solution chosen was the Vo rated Interwell 4 ½" Medium Expansion (ME) Retrievable Bridge Plug, conveyed open water on E-Line, onboard a Riserless Light Well Intervention Vessel. The ME RBP was set directly above the existing plug & prong assembly in the targeted 6-ft window, which limited the fluid volume in the cavity below and aided in subsequent pressure tests. A real-time indication of element expansion in tubing ID from our Surface Powered Electronic Setting Tool (SP EST) confirmed the plug was fully set, creating a deep barrier at 18,000 ft.

The Operator performed extensive testing to establish the new reservoir barrier, with the Interwell Barrier Verification System (BVS) providing pressure data wirelessly from below the ME RBP.

Operational flexibility of the 4 ½" ME allowed for the strategic placement of a second bridge plug in the upper completion above the tubing to casing leak, between two DHPGs. The plug's integrity was independently confirmed by the DHPGs, giving the Operator a second barrier for well suspension.

Value Created

The distinguishing factor of this intervention was utilizing the BVS to confirm reservoir isolation. Real-time pressure differential readings provided on surface during pressure testing showed that additional pressure had to be applied during the positive pressure test, to validate the ME bridge plug to the pressure rating requirements. The BVS system provided the operator with assurance that the plug was not leaking too slowly to detect, as was previously experienced with the R-profile plug.

Web-based execution and remote monitoring from our IO team in Norway gave the Operator confidence in integrating new technology in this high-profile operation, leading to the intervention's flawless, zero NPT performance.

As per the Operator, the BVS produced the most comprehensive downhole barrier verification ever performed in the region, adhering to and exceeding their own and the regulator's isolation standards. The Operator now has the assurance that they will not have to return to the well until it is time to plug and abandon.

