Case Study

Expedited Contingency LHS Saves Operator Potential Downtime

Close collaboration and planning resulted in a rapid solution being deployed despite challenging and ongoing COVID-19 restrictions

Background

Many months before drilling their next well, Rathlin Energy (UK) Limited understood that there was a chance of requiring to sidetrack the well due to wellbore stability issues in one hole section. At this time, discussions began between NOV Completion Tools and Rathlin Energy to assess a contingency liner hanger system's (LHS) availability. NOV supplied various options, and after careful consideration and discussion between both parties, a 4.5-in. cemented liner solution was deemed optimal. Rathlin did indeed encounter issues and had to set the intended 7-in. production casing higher than planned, thereby now requiring Rathlin to utilize the contingency 4.5-in. production liner.

It was determined that this would need to be a fully cemented liner system capable of rotation and should include a liner top packer capable of withstanding up to 10,000-psi differential pressure. Compatibility with Rathlin's production liner and drill string was essential and detailed discussions began between both parties.

"NOV exceeded expectations & facilitated the rapid planning and successful deployment of the contingency liner in a very challenging logistical environment."

- Wells Manager,
Rathlin Energy (UK) Limited

Case study facts

Location: United Kingdom

Customer: Rathlin Energy (UK) Limited

Products

- Polished bore receptacle
- TXP packer
- GSP liner hanger
- Hold down sub/tension anchor
- Drill pipe dart and setting ball
- Single wiper plug
- Landing collar
- Float shoe and collar
- Top drive cement head
- HRS setting tool
- Packer actuator

General well information

- Host casing/weight: 7-in. 29 ppf L-80
- Liner size/weight: 4.5-in. 11.6 ppf L-80
- Well TD: 2,114 m (6,936 ft)
- Liner Length: 786 m (2,579 ft)

Solution

As the 6-in. hole drilling was progressing, the NOV Completion Tools team finalized a 4.5-in. cemented liner design utilizing standard equipment held in inventory, designed for quick deployment. Torque and drag modeling showed that there was sufficient drill pipe weight to set the liner top packer, but because the liner was short and light, a hold-down sub should be utilized to confirm running tool release prior to cementing.

Results

The NOV Completion Tools team prepared a primary and back-up LHS and top drive cementing head while we machined new cross overs and cut threads on landing collars and float equipment. Concurrently Rathlin had to procure a 4.5-in. liner, manufacture their own cross overs and arrange for cementing of the liner.

Considering this occurred amid the global COVID-19 pandemic, this created additional challenges in terms of supply chain, manufacturing, and logistic options. Still, in only two weeks, all of the equipment was ready and shipped to Rathlin's wellsite.

The cemented LHS was run in hole and installed as per plan. The GSP hydraulic liner hanger was set before the HRS setting tool was released prior to commencing cementing operations. The wiper plug was sheared out by the drill pipe dart as expected, and the plugs successfully bumped. The tools were picked up to mechanically set the TXP liner top packer, and then the setting tools were then retrieved back to surface in good condition. Following setting the LHS, the liner top packer was successfully pressure tested from surface with 3,000 psi for 30 minutes with the packer seeing approximately 7,100 psi of pressure during this test.