



# Superior Gas Lift Straddle Solution in collaboration with PTC

Date: July 2021

Region: North Sea, UK



## Key Capabilities

- Manufactured from Super 13% Cr. material
- ISO 14310 Vo qualified, fully retrievable Multi-Run ME APS with large 2.114" minimum throughbore ID
- ePDT for non-explosive precision drilling
- Use of POS and ePDT saved 4 intervention runs compared to conventional methods - saving time, cost and reducing carbon footprint
- PTC GoLift™ Technology
- Successfully installed in the subsea well from the LWIV

## Challenge

A major North Sea operator required a solution to retrofit two Gas Lift Straddles in a subsea well from a Light Well Intervention Vessel (LWIV). The Gas Lift Straddles were required to prevent suboptimal performance of the well as it matured.

The Gas Lift Straddles had to be installed in 4.5" 25% Cr. tubing whilst being able to pass through a 3.750" minimum restriction ID, operate in temperatures up to 107°C and withstand differential pressures up to 3,000psi.

As the well had a high CO<sub>2</sub> content, careful consideration had to be made for the metallurgy of the Gas Lift Straddles.

The operator also wanted to have the ability to pressure test the tubing string before establishing communication between the tubing and A-Annulus to ensure it had integrity and have a platform to perform a reverse circulation after communication had been established.

As the operation was being carried out from the LWIV, any optimisations that could be made to reduce the number of intervention runs carried out was desired.

## Solution

Working in collaboration, we proposed a 2-run 363-450 (3.63" OD for 4.5" tubing) Multi-Run Medium Expansion (ME) Anchored Production Straddle (APS) and PTC proposed their GoLift™ through tubing gas lift straddle system. Due to the high CO<sub>2</sub> content, the proposed equipment was to be manufactured from Super 13% Cr. material.

The 363-450 Multi-Run ME APS has been ISO 14310 qualified to the most stringent validation grade Vo to 3,500psi differential pressure in a temperature range of 4-125°C in 4.5" tubing whilst being fully retrievable and offering a large 2.114" minimum throughbore ID.

The lower module of the deeper Gas Lift Straddle was to be assembled with a Pump Open Sub (POS) to give the operator the ability to test the tubing string and carry out the reverse circulation.

We also proposed our electronic Precision Drilling Tool (ePDT) which provides an efficient, e-line conveyed, non-explosive method of drilling holes in down-hole tubing or casing. A key feature of the ePDT is its electronic feed-through which allows other e-line equipment to be run and operated below it. The ePDT would be run in conjunction with an Electronic Setting Tool (EST), enabling the lower modules to be installed and holes drilled precisely to establish communication between the tubing and A-Annulus in one intervention run.

The deeper Gas Lift Straddle's lower module was run and correlated to depth using e-line then set using the EST with real-time activation from surface. The tubing string was pressure tested against the lower run and POS with integrity being confirmed. The ePDT drilled 3-off 10mm holes in the tubing. No reverse circulation was required as there was more gas in the A-Annulus than anticipated. The upper module with integral PTC GoLift™ Operating Valve was run on e-line. The upper module stinger was run to depth and engaged into the lower module female latch. The upper module was also set using an EST with real-time activation from surface.



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## Solution

The uppermost Gas Lift Straddle's lower module was run and correlated to depth using e-line and set using the EST with real-time activation from surface. Again, the ePDT drilled 3-off 10mm holes in the tubing. The upper module with integral PTC GoLift™ Injection Pressure Operated (IPO)/Unloading Valve was run on e-line. The upper module stinger was run to depth and engaged into the lower module female latch. The upper module was also set using the EST with real-time activation from surface.

The tubing string was pressure tested against the POS to give good indication of both Gas Lift Straddle's integrity prior to pressuring up to open the POS and bring the well back online.

## Value Created

The two Gas Lift Straddles were successfully installed in the subsea well from the LWIV. The collaboration between Interwell and PTC supplied the operator with a superior Gas Lift Straddle solution designed to be in operation for the remaining life-cycle of the well. The use of the POS and ePDT saved the operator four intervention runs compared with conventional methods, thus reducing risk, saving time and cost, and minimising the intervention's carbon footprint.