

# **Gulf of Mexico – Subsea Gas Lift Valve Intervention**

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Abstract:

## **OBJECTIVES/SCOPE:**

This paper presents the technology utilized to efficiently replace a leaking Gas Lift Valve (GLV). The technical challenge was to replace the GLV, at short notice (due to the operating window), allow the Kickover Tool (KOT) to pass a minimum restriction of 3.313", in a 65 degree well at 12,000ft with an "S" shaped profile.

- Enable two runs (retrieve / install) GLV, with no miss runs or NPT.
- Simplify the operational steps from pulling the original GLV, replacing with the new GLV, testing the Completion, then bringing the well back into production.
- Reduced rig time, reduced safety risks, and accelerate well start-up process.

## **METHODS, PROCEDURES, PROCESS:**

Subsea well completed in May of 2020. June 2021 the well was shut in and a pressure increase was observed on the annulus indicating a possible integrity issue.

The Operator looked at the gradients and based on their analysis, the analysis points towards a possible leak at the lower Gas Lift Mandrel. Attempts to pump into the annulus to clear potential debris in the gas lift valves with no success.

A 4-month window was identified to plan & execute the operation. Factors considered were intervention vessel availability, time to design KOT to pass minimum restriction, manufacturing & testing.

An existing KOT (standard size of 3.500"/3.700") was modified to the special clearance size of 3.313". This involved the creation of new manufacturing drawings, assembly drawings and a detailed field operation and maintenance manual. Design was completed in 4 weeks, manufacturing completed in 8 weeks, SIT and deployment offshore to meet the operating window.

Key features of the KOT to ensure operational success –

- 1) Friction Reducing "Rollers" top and bottom to aid conveyance in / out of SPM, especially beneficial on high angle wells.
- 2) Spring Loaded "Offset Dogs" to allow the KOT to pass through the minimum restriction, then open up in the SPM bore.

3) Engineered Trigger Mechanism and “Parallel Arm” for efficient valve installation / retrieval. Prevents damage to seals and packing. 4) Integrated Valve Catcher and “Radially Balanced” body.

### **RESULTS, OBSERVATIONS, CONCLUSIONS:**

This paper illustrates the successful installation and retrieval of the GLV's. Each operation was completed with no mis runs.

Consideration was given to the cost and risk of the Subsea Intervention, versus bringing a high producing well that was down for 8 months back online.

This was the Operators first subsea gas lift intervention in the GOM.

The elastomers in the original GLV's are not well suited for CaBr<sub>2</sub> fluids.