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# Slickline Deployed Distributed Fiber Optic Surveillance Highlights Gas Lift Valve Instability and its Impact on Flowing Well Performance

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## Abstract

Observing dynamic behaviour in a gas-lifted well is problematic for conventional single-point sensors because of the rapid interaction of gas lift valves over long distances in the well. Traditional logging tools can only be in one place at a time. Distributed measurements play a crucial role in observing rapidly changing dynamic behaviour over the entire well. In this case study, the benefits of using distributed fiber surveillance to observe the interaction of valves during gas lift will be demonstrated.

Gas lifted wells are generally designed to operate through an orifice valve set as deep in the well as possible to achieve maximum drawdown for the available lift gas rate and pressure. Shallower unloading valves may be needed during well startup, but should close to allow stable flow through the deeper orifice. Any short circuit of gas through upper valves can lead to inefficiency and loss of production. Gas lift surveillance is essential to confirm the valves are performing optimally, especially when wells mature and pressures and flow changes.

This case study presents surveillance data gathered with distributed fiber run on slickline during gas lift. The status of each of the 7 gas lift valves during gas injection can be clearly seen over the entire length of the completion and the full duration of the survey. In addition, the behaviour of fluids can also be observed in reaction to the changing status of the valves. This helps diagnose the problem, allowing for a robust intervention to remedy the problem.

Distributed fiber surveillance in this gas lift completion shows how valves were interacting in time and their impact on well performance and flow behaviour. These insights could not have been achieved using conventional logging tools.