

First Dual Completion Surface Controlled Gas Lift System Installed in Middle East

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Abstract:

Objective/Scope:

Gas lift is one of the most crucial components for achieving and maintaining production targets for ADNOC Offshore assets. One major factor for this is the utilization of dual completions, whereby two production zones can be produced via a single casing conduit. Gas lift within dual completion wells is extremely challenging with conventional pressure operated gas lift valves due to the dynamic downhole conditions, fluctuating pressure and temperature and the inability to individually control the gas injection rate to each production string. In most cases, the string dedicated to the formation with lower productivity and reservoir pressure tends to "rob" the injection gas from the other. Furthermore, well intervention is required to change out the gas lift valve orifice as downhole conditions evolve over the life of the well. To maximize the gas lift performance of the dual completion well, a surface-controlled gas lift system (SCGLS) was applied to a dual completion well on both production strings.

Methods, Procedures, Process:

A suitable dual completion well candidate was selected in the N Field. Once the candidate was selected a comprehensive design review was completed. The gas lift design determined that two SCGLS were to be installed on each string. Orifice port sizes were selected to ensure that the optimum gas injection rate would be delivered. The SCGLS are connected to a surface control system (SCS) which would enable surface control of the electric valves downhole. Each DIAL Unit features pressure and temperature gauges and valve position sensing to allow the operator to determine the Vertical Lift Performance (VLP) of each string, casing gradient and gas injection rate in real time. Furthermore, the SCGLS was integrated with the field distributed control system (DCS), allowing for remote data driven decision making. A full System Integration Test (SIT) was completed ahead of the field installation, integration, and commissioning.

Results, Observations, Conclusions:

The SCGLS was successfully installed and commissioned. Through the ability to monitor and control the gas injection rate throughout the well life, it is estimated that the implementation of the SCGLS will result in substantial net present value generation through real time production optimization and the avoidance of well intervention,

associated costs and deferred production required for gas lift valve change out and Flowing Gradient Surveys (FGS).

Novel/Additive Information:

This is the first application of a SCGLS in a dual completion well in the Middle East. The paper will describe the drivers for the implementation of the system, the gas lift and completion design, review of the installation and the benefits observed during well unloading and production."