Case study: Anadarko basin, Oklahoma

Intelligent gas lift optimization system increased production 12%, extended life of well

When a marginal gas lift well begins to taper off, operators often switch to another type of artificial lift. Wanting to optimize production on its gas lift wells in Oklahoma's Anadarko basin STACK play, a customer chose to trial the Baker Hughes **Intelligent gas lift optimization system**.

The Intelligent gas lift optimization system can help you achieve your production goals efficiently and predictably. This surface system uses artificial intelligence and machine learning to automatically determine and adjust the optimum gas injection rate over time using readily available, real-time data at the wellsite.

Expectations on this well were not very high as the primary objective was to prove that the intelligent gas lift automation system would function as promoted.

Three-stage trial

Baker Hughes installed the intelligent gas lift system in May 2017 for what would be a three-stage trial. The objective of the trial was to demonstrate the ability to maximize revenue from the well. Net revenue would be measured based on the price of oil and gas, less produced water disposal costs.

For the first month, Baker Hughes monitored the production data from the well site. The intelligent gas lift system made use of all of the customer's existing data by connecting to its existing remote terminal unit (RTU) on site and collecting available data through Modbus communication.

For the second month, base level algorithms were turned on to show basic system functionality.

In the third month, Baker Hughes's advanced production optimization algorithms were initiated. The intelligent gas lift system's advanced algorithms determined accurate liquid rate production from tank level sensors, taking into account tank hauls, cleanups, etc.

The Intelligent gas lift optimization system provided the customer with an empirically derived (data-driven) gas lift performance curve, automatically determined the optimal injection rate, and controlled injection to deliver maximum production and to reduce pressure fluctuations in the casing and in the surface equipment.

The results

Upon activation of the advanced intelligent gas lift algorithms, the well's production decline rate immediately reduced and production improved by more than 10% above baseline. Further, production from the well stabilized, as evident in the customer-generated chart shown on the next page.

Despite original plans to switch to a different lift type, the customer was still using gas lift on this well a year later. And in addition to achieving the trial objective, the customer realized an increase in net daily revenue by using the Intelligent gas lift optimization system.
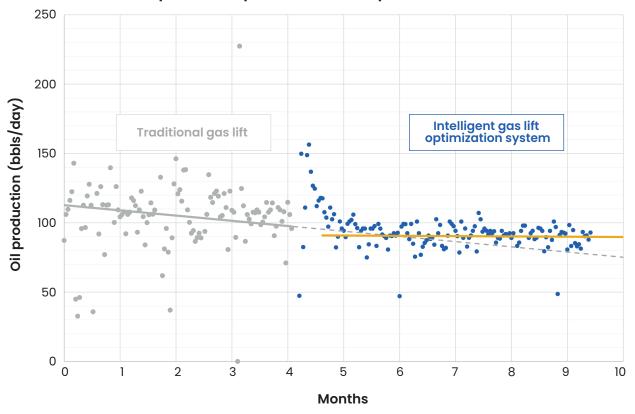
Challenges

- Bring uplift to marginally producing gas lift well
- Nodal analysis indicated no uplift potential from the well
- No direct liquid flow measurement

Results

- Increased total production by 12%
- Prevented unnecessary intervention to prematurely remove gas lift from well
- Demonstrated advantages of automated control and optimization of gas lift system

Intelligent gas lift optimization system
improved oil production over predicted baseline

Oil production decline was significantly reduced after Intelligent gas lift optimization began.

Baker Hughes

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