SURFACE CONTROLLED, ELECTRIC GAS LIFT (EGL) SYSTEMS GAINING GROUND IN THE PERMIAN

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Gas lift optimization for unconventional declining wells has been a challenge. With electric gas lift systems, we saw an opportunity to help alleviate some of the challenging optimization roadblocks. While real time data is always an attractive desire, for some of us it may not be the most important benefit we see in an EGL system. How can we produce more efficiently while maximizing our compression output and extend potential run life in high GLR wells across the Permian? Overall gas lift performance increased overall production and reduction of mechanical failures.

Annular gas lift will always be the winner for reaching initial peak production over conventional tubing flow, but how long will it be efficient and what if we lost half available gas injection overnight? EGL systems gives us the ability to switch our gas injection path without well intervention. We can switch our flow if a compressor is down for multiple days, but what if the opposite happens and a winter storm knocks a group of wells down for a few days? Would it accelerate draw down by switching from tubing flow to annular flow? All these scenarios are events that have caused deferred production in the past.

Valve flexibility that EGL gives us changes how we design our system. Ensuring we could kick a well off was always a part of the design that was prioritized to ensure we had proper pressure surface open compared to compression output. With EGL valves this is not a concern we will face. Not having a pressure surface open and pressure surface close setting eliminates not only multi-point injection on different valves but also allows us to not have to drop casing pressure when staging down to a deeper valve. Valve sizing has shifted from port size to percentage open. The common question that will continue to arise is what is full open? Full 100% open is equating to 3/8. Changing the valve's position on such small increments presents the question of should we being controlling our injection rate at the surface or at the valve? Controlling this as close to the point of injection as we can improves differential pressure across the valve to create more efficient lift.

Real-time high frequency data give us opportunities beyond optimization. The ability to have constant high frequency data at every GL valve, both in the tubing and annulus, presents us with constant traverse surveys and physics-based modeling. These surveys have historically been recorded when a downhole issue needed verification. Real-time surveys allow us to detect and alarm out issues in the well. This will result in accelerated repair time for downhole failures. Real-time data gives us many opportunities to build internal optimization models, but is this the best use of the data? The automation offered within OURA can autonomously stage down, shut in, increase, and decrease gas injection. Staging down automatically is a huge win in optimizing a gas lift system. With continuous development adding more wells to monitor and optimize, these systems will allow the machine to stage down at the exact right time and not wait for it to get reviewed by an operations team member before pulling the trigger on increasing or decreasing the injection rate. With this ability embedded into the whole system, there isn't a need for us to develop a software solution that finds the optimal injection rate. These are resources we can allocate to business problems that need resolutions.

Is integrating EGL into our SCADA environment the logical decision? The backbone of SCADA is to monitor and control our assets. The question is do we need to look at historical data through this Lense? With our current Production Optimization workflows being pushed to business intelligence tools and power apps that our SCADA data is eventually landing on, we feel the effort of going through IT and cyber security risk assessments may not be worth the time and effort if all we are going to add is the ability to visualize the valve's downhole since all surface measurements are being monitored and controlled through SCADA. Our current process to get this data into the cloud that lands in these workflows is being dumped into our data lake through CSV's and then brought into our data warehouse by a data engineering process executed by Databricks. Our future process is to have this data be sent from OURA straight to our data lake using an

API. Accessing an API in place of manual CSV data dumps allows the frequency of the data to be refreshed as fast as every minute compared to every 24-48 hours.

From real-time high frequency data to gas lift performance, this is a technology that is newer to the industry. Our vision is to use this to improve overall production optimization.