Autonomous Setpoint Optimization

Agora

For typical production operations management, minimal to zero historical data analysis is used to adjust the controllers or intermitters in a SCADA operated system. This process cannot be optimized due to some common challenges such as a high amount of wells, increasing individual workload, and lack of high frequency data. When these wells become liquid loaded, the operator must travel to the wellsite to unload the wells to atmospheric pressure. Until the wells are unloaded, there is no production from them. The frequency of manual unloads can sometimes be once in a day per wellsite which creates significant loss of production, high carbon emissions, and an increase in NPT.

Edge AI to Autonomously Increase Production

By deploying our data-driven and physics-based approach for autonomously managing choke setpoints via the Agora Platform on each wellsite, we can convert the wellsite into an intelligent and autonomous production system. Agora's edge AI solution dynamically controls well setpoints to continually optimize production during changing well conditions.

These production wellsites are also connected to a cloud service for management and over-the-air updates. Once deployed, this application increases production and reduces trips for manual unloading which significantly reduces operational carbon footprint.

Agora Platform

Agora is an open, secure, and scalable platform which enables oil and gas industry to connect physical assets to the digital world. E&P operators face constant challenges of choosing the appropriate IIoT provider out of many that are coming from various industries. Agora is solving this challenge by working with multiple IIoT, automation, and instrumentation companies as well as application providers in order to create the biggest ecosystem of oil and gas specific applications in the Agora Marketplace.

Challenges

- Deferred production
- Operational inefficiency
- Manual intervention
- Limited data and analysis

Edge Solution

- Operate well setpoints autonomously
- High-frequency data monitoring and smart alerts to detect anomalies
- Remotely update setpoints to adjust and examine well behavior
- Test multiple open/close scenarios for fine tuning well optimization
- Identify key parameter trends and thresholds

Benefits

- Production optimization
- Reduce manual unloads and wellsite visits for controller intervention
- Enhance operational efficiency
- Minimize HSE exposure

Agora

Autonomous Setpoint Optimization Increases Production by 10% and Reduces Manual Interventions by 80%

Data-driven approach autonomously manages choke setpoint to increase production and reduce manual interventions on gas wells in Haynesville

Agora's edge AI solution enabled autonomous operation of gas wells–without manual interventions that challenges project economics and the sustainability of operations. The data driven and physics-based approach dynamically controlled well setpoints to continually optimize production operations.

The operator's challenges

Management of hundreds of wells on intermitters did not permit the operator time to optimize their choke setpoints in real time for each individual well. This led to a high frequency of liquid loading events each month that require the operator's production team to visit the wellsite and unload the well manually so it can return to normal operation. This tedious process consumed resources and increased production costs. The operator wanted to find a solution that improved the efficiency of their personnel, autonomously managed their choke setpoints, provided incremental production gain, and reduced or eliminated the need to manually unload the wells.

What Agora recommended

The AgoraGateway–an intelligent edge computing device–was deployed on 10 wells to capture, monitor, and control the choke setpoint. An algorithm developed by Agora was deployed on the AgoraGateway to autonomously manage the choke setpoint and flow the wells without human intervention.

Improving operations with edge AI

As the well's naturally decline, the algorithm adapts to learn new thresholds to manage the choke setpoint, maximizing the amount of time the wells flow in steady state. In addition to improved gas rate, the algorithm proactively identifies potential liquid loading scenarios mitigating them before they occur, and alerting the user to wells that will still require manual intervention. The unloading procedure prevents or minimizes liquid loading by utilizing multi-parameter threshold criteria and a self-unloading mechanism to remove water from the wells and create enough differential pressure to allow the wells flow normally.

What was achieved

Over the three-month production period, Agora improved production by 10% and reduced manual unloading up to 82% across 10 wells. The operator projects to realize a total increase of 135,000 MCF of gas in one year.

In addition to the production increase, the sustainability of operations were improved via the edge algorithm management. The reduction in manual unl will substantially reduce the need for field technicians to make trips to the wellsite for liquid loading events, significantly reducing the operator's carbon footprint.

AgoraGateways automate and optimize the choke setpoint on gas wells in the Haynesville Shale.

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