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Industry Busy Meeting Rising Need for Gas Compressors

By Colter Cookson

As the oil and gas industry has adopted the mantra of fiscal discipline, its response to climbing commodity prices has become more deliberate. But respond, it does. The surge in activity is readily apparent in the compression industry, where packagers, contract compression service providers and aftermarket service providers report strong demand.

Leveraging Data

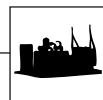
To meet that demand and help decarbonize the natural gas supply chain, these companies are finding ways to work faster and smarter. For Archrock, that effort has included deploying telematics across its entire fleet to collect more detailed and digestible data, notes Steve Abernathy, the company's strategic transformation director. "It's early on, but we already have field examples of the data improving our compressors' reliability, efficiency and emissions," he says.

Telematics delivers those benefits largely by simplifying fieldwork. "As we designed the system, one of our objectives was to make technicians' and service managers' jobs easier," he comments. "If we do that, we can provide the customer and our employees a better experience."

Abernathy adds that automation and remote monitoring can make oil field jobs



By deploying telematics across its fleet, equipping previously analog units with digital controllers and developing mobile tools, Archrock says it has improved its technicians' and service managers' ability to anticipate and fix problems.



more appealing. “Our compressors need to run 24/7, but no one enjoys getting a call at 2:00 a.m. on Saturday because equipment is down,” he reflects. “We all are much better off when we see potential problems ahead of time and can take care of them before they cause unscheduled downtime.”

When something unusual does occur, Abernathy says the telematics help technicians address it efficiently. “Before they head to the site, they can access a control system dashboard online and look at the unit’s history to diagnose what happened,” he illustrates. “In many cases, this lets them grab the parts they will need before heading to the site, which is much faster than diagnosing the problem on-site, then leaving to pick up parts and return, or waiting for someone to deliver them.”

Abernathy points out that eliminating unnecessary trips to the field also reduces safety risks and vehicle emissions.

“While deploying the telematics, we upgraded analog units with digital controllers,” he mentions. “Most of the up-graded equipment includes encrypted Wi-Fi, so when technicians arrive on-site, they can quickly check the control system and see real-time data using their ruggedized laptop versus the small screen on the unit.”

Early Gains

In the long run, Archrock intends to use machine learning algorithms and other advanced analytics to predict equipment issues before they happen, Abernathy notes. However, he stresses that even the simpler analytics currently available can be extremely powerful. “We are already using the data to put together straightforward

analytics that gives service managers and technicians indicators of potential problems. For example, we can highlight early warning signs for detonation issues such as head problems and valve issues.

“We are codifying some of our expertise to automatically create reports that show which units warrant near-term attention and which parameters to focus on, with more urgent issues highlighted in red and ones that need to be monitored shown in yellow,” Abernathy continues. “This helps our service managers and technicians prioritize, be more proactive and work more efficiently.”

Abernathy says that more accessible access to data and better analytics tools often enable Archrock to spot problems upstream of the compressor, then work with its customers to diagnose the cause and address the issue. “We are seeing case after case where this type of collaboration has improved customers’ through-put and maximized uptime,” he reports.

“By looking at the data, we also have found opportunities to change how we set up, control and tune the equipment that will reduce emissions and increase the reliability and longevity of key parts,” Abernathy says. “These changes could be huge. We are confident these alone will deliver significant cost savings each year. Providing more reliable compression services while reducing emissions and costs is a win-win proposition for all stakeholders.”

Data Governance

During the two-year process of deploying telematics across its fleet, Abernathy says, Archrock also addressed one of the biggest problems with legacy data: inconsistency. “When we began to analyze old data, we

spent a significant amount of time cleaning it up. For example, the same tag-suction pressure—could be labeled different ways across the legacy data field,” he explains. “We do not want to encounter that issue going forward, so we have emphasized data governance, including standardizing tags and creating processes to ensure the data we receive is consistent,” Abernathy relates. “This quality control enables the analytics to be consistent, reliable and actionable.”

As the data comes into Archrock’s data lake, it is monitored to detect anomalies, such as unusually high readings that may indicate a sensor configuration issue, Abernathy notes. “I cannot stress enough how important data governance is,” he comments. “It is laying the ground-work for us to better anticipate issues and improve performance.”

According to Abernathy, edge computing will play a role in that effort. “The cloud is powerful, but sending data to the cloud, waiting for it to be processed and sending a decision back to our equipment sometimes takes tens of seconds, which is too long for certain applications,” he explains. “For instance, we have algorithms on the edge that monitor the data that our units record every second for signs of specific types of impending or actual equipment issues. If those signs show up, these algorithms can shut the unit down in seconds.

“We also plan to use edge computing to improve automated, equipment-driven self-control,” he says. “We are running models to create decision guides for the controller at the edge so it can respond more intelligently to changing conditions. This automation will increase compressor reliability while reducing emissions.” □

An aerial photograph of a two-lane asphalt road curving through a lush green forest. A white truck is driving on the road. The scene is captured from a high angle, showing the texture of the trees and the road's surface.

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A photograph of an industrial facility, likely a natural gas compressor station. Large blue metal fans are prominent in the foreground. In the background, there are snow-capped mountains under a clear sky. A truck with its headlights on is visible on the right side of the image.

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