

## Machine Learning Increases Production By Automating Critical Tasks

By Colter Cookson

Automation and remote monitoring have a long track record of improving wells’ production and longevity. As those technologies constantly perform optimizations and highlight the wells and equipment that need attention, pumpers work faster and smarter.

By leveraging rapid advances in edge computing and machine learning, service companies are expanding automation’s capabilities and reducing its deployment costs to bring even stripper wells under the “manage by exception” model. Simply stated, the components of artificial lift systems continue to become more robust and efficient.

Because stripper wells’ production tends to fall short of justifying investments in sophisticated SCADA systems, pumpers generally need to check them manually rather than using remote monitoring, reflects Randy Krall, the founder of Telemetry Insight. To trim the cost of remote monitoring, he says the company has developed sensors that, at costs below \$2 a day, can tell whether a pumpjack is running.

“With our sensors, pumpers or field supervisors get daily reports every morning that sort the wells they oversee by how long they have been down, with the ones that have been down the longest at the top of the list,” Krall describes. “The goal is to let pumpers know where they need to go first so they can optimize their time instead of driving around to look for issues.”



## PRODUCTION PERFORMANCE

In addition to producing daily reports, Krall says the cloud-based software that interprets the sensors' data can graph each pumpjack's strokes per minute, as well as when it stopped and started.

Krall estimates that traditional remote monitoring systems, which can require thousands of dollars in hardware and software, increase production 2%-5%. "If they can achieve even a fraction of that production gain at \$2 a day, our customers will see a strong return on investment," he says. "From anecdotes, we know some customers are saving thousands of dollars by catching events they otherwise would not know about."

According to Krall, the monitoring system is affordable because it combines

low-cost components in a novel way. "For example, we use accelerometers, the devices that allow phones and tablets to tell whether they are being held vertically or horizontally. They once cost thousands of dollars, but are now almost disposable," he says. "By sampling readings from them at high speeds, sending that information to the cloud, and analyzing it with a neural network, we can determine how the pump is moving."

Installation is so simple that customers do it themselves, Krall adds. "The monitor attaches to the top of the bridle with a magnet, so all the customer needs to do is shut the pump off, climb the pumpjack to stick it on, and turn the pump back on," he says. "Once that is done, we acti-

vate the monitor remotely."

Noting that they are made in Albuquerque, N.M., Krall says the monitors have been built for the oil field. In demonstrations, they keep working even after being run over by a backhoe or dropped 20 feet to simulate a fall from a pumpjack.

The solar-powered devices can shut down if panels get covered in dust or if the area experiences a particularly lengthy stretch of cloudy days, Krall notes. "In one of the few cases where we have had a monitor stop reporting, it was on an unusually short pumpjack where two dirt roads intersected. As trucks drove by, they would kick dust onto the solar panel. Eventually, it built up enough to keep the solar panel from working. All we had to fix that was wipe off the dust."

As of early January, Krall says Telemetry Insight has deployed several hundred monitors across seven states: California, Utah, New Mexico, Texas, Oklahoma, Nebraska and Kansas. "We are growing partly because the sensors are so affordable and easy to deploy that we can send companies several to try for 30 days without taking much risk," he comments.

Krall says Telemetry Insight plans to offer versions of the monitor that mirror pump-off controllers' capabilities. "Many of our customers will be happy with merely watching the pump, but others will want pump-off detection and other control capabilities," he says. "The constant optimizations such control allows can save thousands of dollars a year in lost revenue and unnecessary costs." □



**With a solar-powered device that costs less than \$2 a day, stripper well operators can count each pumpjack's strokes and determine which ones are no longer running. According to Telemetry Insight, this information helps pumpers prioritize sites that need attention.**