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New Technologies Optimize Production

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Optimizing production economics is always a concern for oil and gas companies, but with robust demand and high activity levels creating upward pricing pressures on all types of equipment and field services, production optimization has become a top priority to maximize revenue streams in both conventional and unconventional fields. Consequently, operators are examining their oil and gas properties to determine how advanced technologies and services can help them improve production performance and better monetize the value of their assets.

Equipment manufacturers and service companies are responding by rolling out new technologies in an effort to help operators meet their production goals while minimizing costs and staying ahead of increasingly stringent emissions regulations. Downhole technological advances in solids separators and electrical submersible pumps are helping operators get the most out of producing formations. On the surface, innovations are reducing fuel costs, enhancing safety and giving producers the ability to more efficiently monitor equipment on remote production sites to reduce downtime and bolster the bottom line.

Motor Controller

The TechnoWise Group's new MOTORWISE™ motor controller is saving operators 20-30 percent on electricity costs in the field, says Chief Marketing Officer Frank Fernandez.

The energy-saving controller is designed for three-phase motors on pumpjacks using wye, delta, and grounded-delta power distribution schemes, he says. Models are available to accommodate pumpjacks with up to 30-, 60- and 100-horsepower motors.

Pumpjack motors are subject to varying loads throughout a pumping cycle, Fernandez says, noting that MOTORWISE units adjust the amount of electricity to correspond with the load requirement at any given time.

"The controller dynamically monitors the loading on that electrical motor multiple times for every cycle and weight position of the pumpjack," he states. "It makes decisions on how much energy the motor needs to do the work at each interval. The power the motor receives is matched to the amount of work the motor needs to do. If the motor is doing a lot of work, it gets a lot of energy. If the motor is not doing much work, the level of energy is reduced."

The MOTORWISE™ controller from the TechnoWise Group is designed to reduce electricity costs by monitoring pumpjack loading and automatically adjust the amount of electricity supplied to the motor based on specific load requirements at any given point in the cycle.

Pumpjack motors commonly operate as generators during a portion of the pumping cycle and supply energy rather than consume it, Fernandez points out. During those portions of each cycle, the controller adapts the power system to compensate for it. Each unit includes a soft start feature that lets the motor transition smoothly from rest to full speed, which reduces mechanical stress on the motor and the pumping equipment, he adds.

"It is difficult to measure the cost from wear on equipment that goes to full start immediately and is subject to that immediate stress, but the difference of the impact from a soft start feature is very pronounced," Fernandez says. "If a company invests $1 million a year replacing belts, for example, a 20-50 percent reduction in expense would be substantial."

The controller also reduces the high-demand penalty cost charged by utility companies. By regulating the power as needed, motor life is extended because the equipment runs cooler overall, he notes. "The life expectancy of the electric motor is reduced with each degree of temperature rise," points out Fernandez. "It could very well extend the life of a motor by 50 to 75 percent."

The MOTORWISE control includes

solid-state technology in a weatherproof cabinet that can be installed on a pole or to the back of a pumping unit. After installation, there is no maintenance because there are no moving parts, fuses or contactors, according to Fernandez.

The company has worked with selected operators to demonstrate the technology's performance in the field, he reports. "In the Permian Basin, operators have seen savings of more than 20 percent on their electric bills from operating more than 1,000 wells with the controller installed," Fernandez states. "Electricity consumption is often the highest cost associated with operating a well, and reduced electricity consumption results in real savings that go straight to the bottom line."

The payout period for a MOTORWISE installation varies based on the rates operators pay per kilowatt hour and on how often individual pumps run, but Fernandez says it averages from 24 to 36 months."We are seeing net present value of more than $2 million for each $1 million invested in this equipment," he concludes. "The internal rate of return for operating companies can range between 30 and 50 percent over 10 years." ❐