

## Activity Spurs Artificial Lift Innovation

By Danny Boyd

As oil and gas producers develop unconventional plays and explore ever-deeper waters, they are exposing artificial lift equipment to harsher downhole conditions. These conditions include not only higher temperatures and pressures but also higher viscosities and more deviated, longer laterals.

Artificial lift providers have responded by developing a host of systems with the strength of Popeye and the flexibility of Batman. One of the solutions include:

- Multiphase pumping systems capable of handling 100 percent gas volume ratios.

### Multiphase Pumps

In a move that company President Sven Olson says has game-changing applications, Leistritz Corp. is utilizing advanced technology to apply multiphase pumps to wet shale gas plays and ultradeep water.

According to Olson, Leistritz's multiphase pumps are able to pump oil, gas and water at once from remote production sites to a central processing facility without separate flowlines, separators, heater-treaters, tanks, flares, stock pumps and compressors. He says this improves the economics of remote wells by reducing capital expenditures and operating costs.

In addition to reducing equipment footprints, multiphase pumps eliminate the need for flaring or venting at the site, an increasing regulatory challenge for operators, Olson notes.

Leistritz Corp.'s systems feature twin-rotor, double-flow screw pumps with an integral rotor and shaft made in one piece. The pumps are designed to operate with

100 percent gas volume fraction, Olson says. He adds that a short bearing span and stiff rotors minimize rotor deflection and seal misalignment, and include hardened rotors and rotor bores for maximum wear resistance.

Either single or double mechanical seals are equipped with a seal flush system in accordance with API plan 11 or 54. The pumps have a double helical timing gear for minimum torsional deflection, Olson says.

The prime mover can be an electric motor, a gas engine with a belt, or a direct

drive. The system is available fully packaged with standard packages or fully customized systems for onshore, topside or subsea installations, Olson reports.

The pumps can handle low inlet pressures, which Olson says makes them ideal for lowering flowing back pressure, resulting in substantial gains and accelerated production.

"There are a number of advantages to using multiphase pumps for artificial lift," Olson says.

He points out that the pumps are being deployed in shale wells, including several



With advanced multiphase pumps, Leistritz Corp. says operators can transport oil, gas and liquids to a central location for processing without separate flowlines, separators, heat treaters, tanks, flares or stock pumps and compressors. The pumps are being used in oil- and liquid-rich shales, ultradeep water, and steam-assisted production.



wells in the Bakken, to allow operators to deliquify wells that tend to get blocked by hydraulic fracture water and produced water that would otherwise prevent the well from bucking the line pressure.

“There will be more units going out, especially as these wells age and they no longer have enough natural pressure,”

Olson predicts.

The multiphase pumps also are deployed in steam-assisted production in Canada, where the pumps can handle the vapors that come from steaming the reservoir. The pumps are capable of drawing down all the vapors and allow the conventional pumpjack or ESP to work more

efficiently, Olson explains.

Subsea, the company has heavy oil twin screw pumps deployed for Petrobras. Leistriz also is working with Shell in a program to develop a high-boost multiphase pump in ultradeep water in conjunction with Houston-based Cameron, Olson relates. □