

PREVENTING VENTING

Solar-powered separators and low-flow metering improve economics, help with compliance

By Godfrey Budd

Two recently introduced devices from Calscan Solutions, an Edmonton-based company best known for its design and manufacture of surface and downhole oil and gas field recorders, should help reduce methane venting in the upstream sector. One is a low-power electric control system for new and existing separators. The other more recent device is a low-flow meter.

When the company first started marketing its Bear Solar Electric Control System for new and existing separators, the plan was to push the environmental benefits. After all, the electric system replaces the pneumatic controls that rely on fuel gas—some of which gets vented.

“When the liquid goes to the separator, the level controller opens a valve for the work of controlling with a big gas-driven actuator, which vents gas,” says Henri Tessier, president of Calscan. “The valve vents more methane, potentially, than the controller by an order of magnitude. In the Calscan system, the controller and the valve are electric. The Bear system cuts out all the venting.”

But the environmental angle didn’t resonate much where the system was initially

launched: western Canada’s oilpatch. Clients found other aspects of the system attractive, however. Compared to pneumatic controls, electronic ones have far lower maintenance requirements, are more versatile and reduce operating costs. Sour gas well operators, who traditionally have had to use propane for pneumatics, can save serious money. “Propane can cost \$10,000–\$50,000 per year per well. Switching from propane to electric, a company can expect payout within a year for a retrofit,” Tessier says.

It takes longer, of course, to get your money back if natural gas, at around \$4 per thousand cubic feet, is being used—likely three to four years. But, Tessier points out, with no gas being vented, the site is not only cleaner, it is safer.

He says the Solar Bear has been on the market for about four years, with about 250 units in the field. “We’ve had a good track record with it so far, with no maintenance needed yet. The system can be tied in easily with SCADA [supervisory control and data acquisition] because of its on-board electronics. It can tell the operator what’s

going on without him having to go out to the field.”

The Bear’s solar power system is engineered for 10 days reserve at minus 40 degrees Celsius with an average of two hours per day of sunlight, the company says.

Aside from avoiding the costs associated with propane or natural gas, other advantages of the electronic control system can also improve field operations, he says. For one thing, going electric means sidestepping problems stemming from not enough gas pressure to run pneumatic controls. Also, the system eliminates repairs and maintenance requirements because of wet or even small amounts of sour gas.

Although efficiency and reduced operational costs have been the strongest selling points in Canada until now, this could change as tougher regulations and heightened awareness of the health and environmental issues in the United States start to spill over the border. Some would argue it already has. British Columbia’s *Flaring and Venting Reduction Guideline* from 2013 indicates that the province’s regulators want to know the amount of gas vented from all oil and gas operations. “All

GOING ELECTRIC

Operated on solar electric power, equipment such as Calscan’s vent gas meter not only reduce emissions, but also require less maintenance, are more versatile and save money.



PNEUMATIC DEVICES – FACTS AND FIGURES

the data has come out from the EPA (United States Environmental Protection Agency) and other testers. A single two-phase separator can vent 10 cubic metres a day, and a three-phase separator can vent up to 95 cubic metres a day of methane. Fifty to 70 cubic metres a day is common for separator controls.”

For one Canadian client, however, the Solar Bear’s better environmental profile was the initial draw. “The Bear control system came to our attention as we were looking to make our operation more green-friendly,” says Glen Kuzio, a production manager with TAQA North Ltd.

But that is not the only advantage.

“Besides the gas savings, it gives you a lot of flexibility for well control. There are more things you can do,” Kuzio says.

In light of regulatory tightening in the United States and British Columbia, the arrival on the market of Calscan’s new low-flow meter appears well timed. The Hawk Surface Logger 9000 is designed to measure and digitally log low-flow vent gas with a high degree of accuracy. “The low-flow meter can tie in with venting valves and other instrumentation. You run all the gas through the bulkhead, then the meter, then vent,” Tessier says.

Since the Hawk uses a positive displacement diaphragm meter, flow rates as low as zero can be measured. The device also uses a precision pressure sensor, an external temperature probe and industry-standard algorithms to measure gas rates. A company brochure says the accuracy is within two per cent.

Once a test is complete, “The Hawk 9000 can easily generate a PDF record for a clear audit trail,” Tessier says.

The Hawk is being used at a range of locations, including wellsites and gas plants. “It has lots of applications. A lot of meters give you a snapshot only. This gives you a true understanding of what’s happening over time, so you can crunch real dollars over the value of the vented gas,” says Joshua Anhalt, president of GreenPath Energy Ltd. The service provider helps companies with the economics of emission reduction technology and compliance.

For gas plants, the Hawk can help with the development of a match between optimal technology, economics and an emissions management program. “It gives us continuous info and helps us decide whether the site is worth spending capital on,” Anhalt says. ■

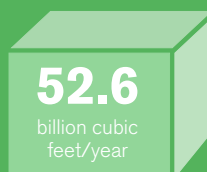
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Emissions from pneumatic devices used in the U.S. oil and gas industry, including upstream production sector emissions, as well as those from the transmission, storage and liquefied natural gas sectors, total approximately 52.6 billion cubic feet per year.



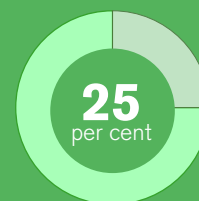
SOURCE: U.S. ENVIRONMENTAL PROTECTION AGENCY

In the United States, the Environmental Protection Agency has invested in programs to encourage the oil and gas sector to switch to low-bleed controllers. The states of Colorado and California have brought in regulation for pneumatic gas-driven controller venting.



SOURCE: CALSCAN SOLUTIONS

An estimated 25 per cent of chemical injection pumps in the upstream sector use associated or fuel gas-driven pneumatics.



SOURCE: U.S. ENVIRONMENTAL PROTECTION AGENCY
INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND
SINKS: 1990-2012

Regulations in British Columbia stipulate that all greenhouse gas emissions from pneumatic instrumentation and pumps must be tracked for reporting and compliance purposes.



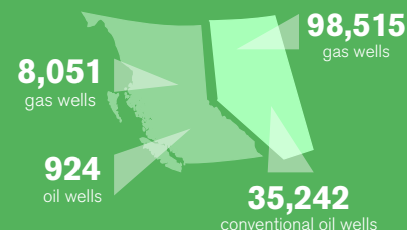
SOURCE: FINAL REPORT FOR DETERMINING BLEED RATES
FOR PNEUMATIC DEVICES IN BRITISH COLUMBIA,
FROM THE PRASINO GROUP

In British Columbia’s oil and gas sector, high-bleed pneumatic controllers and pumps vent 436,000 tonnes of CO₂ equivalent into the atmosphere each year.



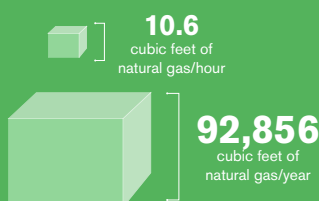
SOURCE: THE PRASINO GROUP

British Columbia has 8,051 gas wells and 924 oil wells operating. Alberta has 98,515 gas wells and 35,242 conventional oil wells operating.



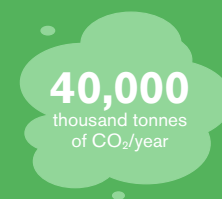
SOURCE: CANADIAN ASSOCIATION OF PETROLEUM
PRODUCERS 2014 STATISTICAL HANDBOOK

Some high-bleed pneumatic devices vent an estimated 10.6 cubic feet (0.3 cubic metres) of natural gas per hour, or 92,856 cubic feet per year. Some devices are specified by their manufacturers to vent more than three times that amount.



SOURCE: THE PRASINO GROUP

The estimated 200 sites with Calscan Solutions’ solar-electric-powered Bear Control Systems installed by the end of the 2011-12 season were eliminating 40,000 tonnes CO₂ equivalent per year.



SOURCE: CALSCAN SOLUTIONS