Marcellus Shale Coalition -- Shale Insight 2015 – Technology Showcase -- 9/16/2015

WellBoss™ Saves Lives, Saves Money -- Text for Al Ketler's slide presentation --

1. Rel-Tek has pioneered in gas detection technology for mines, tunnels and the natural gas industry over the past 35 years. Our introduction to the Marcellus gas activities has uncovered new requirements and products for safety and economy that I want to give you a glimpse of today.

2. The WellBoss is a stand-alone gas detection system for deployment on gas and oil wells. It is a second generation product, and has been tested in all weather conditions. The unit sets at a corner of the well property, facing south for best solar access. AC power can be used, but line power is often a scarce commodity in Pennsylvania's outback. Also, communications for off-site communications is often unavailable, so a satellite link is available. This uses the same high security satellites and cloud media as employed by NASA and the DOT.

   Scanning through some of the features of the WellBoss system… All our gas sensors are approved Intrinsically Safe, NEC Class 1, Div 1. As you may know, I.S. is a challenging approval rating to obtain, but it's worth the effort, as extra safety and maintenance benefits accrue to the end user. Automatic sensor calibration is included, thus eliminating costly site visits to maintain accuracy of the gas sensors

3. The GasBoss combustible gas sensors use extra-high sensitivity, wide-spectrum catalytic-bead technology, the same technology as used in underground coal mines. This is important, as this technology accepts all combustible component of natural gas -- with no distortion… more on that later.

4. This shows a few of the sensors that can be used on the WellBoss system. Our Spot-Fire flame detector on the WellBoss provides incredible sensitivity to detect even small fires. I am testing a Spot-Fire unit at this presentation, using a Bic lighter at about 60 ft. distance. This is far more sensitive that others flame detectors you may be using. The benefit, of course, is that just one unit can cover a very large expanse, possibly the entire well site. The demonstration indicated a flame detection alarm in a few seconds.

5. Greenhouse gas emissions are costly. We all know that natural gas is not pure methane. Indeed, natural gas contains a host of other combustible gases in varying amounts, depending on the well. Methane is a greenhouse gas, ethane is not. Most natural gas constituents are innocuous, but ethane is a killer for certain methane sensors you may already be using on your well sites. The British mining engineers discovered 40 years ago that optical (NDIR) methane gas detectors massively react to ethane, because the optical absorption footprint of ethane is virtually on top of that of methane. Yet, oddly enough, NDIR sensors are widely used in the gas and oil industry for detecting natural gas, users ignoring the fact that 1% of ethane reads as about 20% of methane. It's not unusual to read 150% methane in natural gas using an optical (NDIR) methane sensor.

6. This fact is shown the on side by side testing of a catalytic bead sensor (i.e. Rel-Tek) shown in blue, against a well-known and respected optical (NDIR) sensor, shown in red. Applying a mixture of 2% methane with just .25% ethane in air, note the wild excursion of the optical sensor when the ethane concentration reaches just 0.18%. Our survey of 15 Marcellus gas wells show ethane concentrations of 1% to 14%, so you can expect massive errors using optical sensors. Obviously, optical (NDIR) sensor technology is not a good choice for monitoring natural gas. Aside from frequent false alarms, using optical sensors in natural gas will vastly inflate the amount of methane, i.e. greenhouse gas emissions detected. Rel-Tek sensors measure the methane accurately and can head off unnecessary greenhouse gas assessments and fines.

7. Optical sensor manufacturers like to claim only one calibration per year, as indication of its low maintenance cost. They don't mention the intervening BUMP tests, which still require application of cal gas, but not the zero gas. But, then, bump tests are technically not calibrations, in their unique nomenclature. The green line shows Rel-Tek sensors, and the Blue line is the optical. Notice that they blank out all readings not exceeding about 2.2% of full scale, thus the sham claim to have zero drift and presumably long term stability. This blanking also eliminates any possible detection of small gas leaks at the early stages. Rel-Tek avoids this flimflam and provides wide-spectrum sensors with fully automatic calibration. MagiKal assures continued accuracy of all of the combustible and toxic gas sensors on site for years on end, totally unattended, and with calibration accuracy better than possible manually. Naturally, this does, indeed, eliminate the high cost of those monthly site visits for manual bump tests and calibration visits for optical sensors.

8. The layout of a gas well plot is illustrated in this drawing. Note the video camera beside the WellBoss unit. Up to eight gas sensors can be used, typically 4-natural gas, 2-carbon monoxide, two smoke and two Spot-Fire units. Remote sensor stations connect to the central powered controller for power and communications. Telemetry is very fast -- 120 sensors per second. Wireless connections are possible.

9. Video cameras can provide valuable off-site confirmation of fires and gas leakage problems, day and night. An infrared video camera can pan and zoom onto gas or flame detection via automatic control, as well as manually by Internet commands. IR lighting can extend useful range to 300 yards, making it possible to remotely distinguish hazardous conditions, as well as observing personnel, and even zooming in on license plates. Rather than re-inventing the wheel, Rel-Tek has partnered with our neighbor Securadyne Technologies, experts in this technology and well experienced in the oil and gas industry.

10. A summary of the WellBoss capabilities and features that contribute to the enhanced safety and economy of this fine product. Well_Boss Saves Lives,, Saves Money

Call or email any questions or comments.

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