

## **Laser-Based Natural Gas Sensors Keep Moisture Out of El Paso Pipeline**

*Reliable NASA-based gas analyzer technology keeps oil producers aware of moisture content before entering El Paso Natural Gas Company pipeline - helping producers avoid expensive shut-ins*

(PRWEB) March 22, 2006 -- Because natural gas produced at the wellhead often contains contaminants, including water, it must be cleaned and brought to "Pipeline Quality" before it can be safely delivered to high-pressure, long-distance pipelines. Natural gas that is not within certain moisture levels can cause operational problems, pipeline corrosion and long-term deterioration and even the possibility of pipeline ruptures. Given the consequences, various processes are used to remove this water vapor.

In the past, many natural gas producers, processors and distributors have relied on direct contact, surface-based electrochemical and crystal sensors for measurement of residual moisture in gas. However, that older sensor technology has proven highly unreliable, producing false data that can result in unwarranted shut-ins and/or contaminated gas getting through lines.

"If we were to shut-in a producer due to a false moisture reading, millions of cubic feet of gas could be delayed and possibly incur unnecessary dehydration costs," says Melvin Yancey, a Field Measurement Technician at the El Paso Natural Gas Company's (EPNG) San Juan District in the Four Corners Area. "On the other hand, if the gas does not meet EPNG's criteria for quality, as required in our tariff, we would not take the gas and the gas may have to be vented."

To avoid those possibilities and meet quality standards of pipeline gas, EPNG has installed a new laser-based sensor technology at the location where each of its 16 major producers in the San Juan area joins the pipeline.

Marketed under the SpectraSensors brand, this is a far more advanced and trustworthy monitoring technology -- a tunable diode laser (TDL)-based technology developed at NASA's Jet Propulsion Laboratory at Caltech that is highly effective in detection of contaminants in natural gas. Manufactured by SpectraSensors, Inc., a leading developer and producer of optical-based [natural gas sensors](#), the highly reliable "bread box-size" gas analyzer provides non-contact measurement of moisture, carbon dioxide, and other corrosives in natural gas pipelines.

Tunable laser-based [natural gas sensors](#) are fast, accurate and flexible. They are also cost effective. While initial purchase price is somewhat higher than problematic surface-based natural gas sensors, even the most conservative evaluation of this advanced technology indicates that maintenance saving alone will provide a return on investment in a relatively short period of time.

El Paso feels that pipeline operators and producers alike are in need of ongoing and accurate gas analysis. "If there were faulty or bad readings," says Yancey, "then the customer is going to dispute why I shut them in. Let's say a producer is piping hundreds of millions of cubic feet of gas. So, if I shut in that producer, the cost could be immense."

Each producer can monitor El Paso's gas analyzer readings by capturing the electronic signal from El Paso's unit via a SCADA system and viewing the readings in the producer's control room.

Considering the downside risk of moisture in the gas, and that SpectraSensors are monitoring the quality of gas worth tens of millions of dollars per day within this area of EPNG's transmission alone, it is reasonable to conclude that this laser-based sensor system could pay for itself in a brief period of time.

For example, transmission pipeline operators have traditionally relied on electrochemical sensors as gas analyzers to monitor moisture. These sensors incorporate a coated surface, and a higher electrical capacitance across the surface indicates higher water content. However, these capacitance sensors are susceptible to contamination by glycols or amines in the gas, which can cause exaggerated readings or a failure to detect.

An erroneously high reading could force the operator to temporarily shut down the pipeline, costing the company tens or hundreds of thousands of dollars. The gas producer may choose to over-process the gas to ensure it is within the tariffs imposed by the pipeline operator. Because the laser-based gas analyzer responds quickly and provides a reliable measurement that will not drift, it can be used in a closed loop to control the blending of dry and wet gas, allowing the producer of pipeline to optimized costs by staying just within the tariff.

Because a laser system never comes into contact with the contaminants present in natural gas -- as do electrochemical and crystal gas sensors -- the laser-based gas analyzer practically eliminates maintenance and operational costs. Studies show the cost of operating and maintaining "conventional" electrochemical sensors carry a cumulative annual expense often exceeding \$50,000 per unit, including labor, recalibration and rebuilding, back-up sensor heads as well as unnecessary gas dehydration and tariffs -- all of which are obviated by laser-based [natural gas sensors](#).

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