Article AT/NGC8106-EN Rev. A

NGC8106
Gas Chromatograph Trials

Trials compare the online NGC8106 gas chromatograph with composite sampling of residue natural gas sales.

Introduction

Enterprise Products Operating, L.P. in San Antonio has conducted trials of the new ABB NGC8106 online gas chromatograph, a lower-cost model designed for analyzing lower natural gas flowrates than ABB's NGC8206 model. Both units accurately determine the energy content of the gas, which constitutes its sales value in custody transfer transactions.

According to John Lambdin, Analytical Supervisor for Enterprise Products, his company can justify the online NGC8206 model for residue gas flows higher than 10 SCFD, but relies on composite samplers for lower flow rates. The company measures and totalizes gas flowrates with a two-stage orifice flowmeter.

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The raw gas originates from multiple wellheads. The company collects and processes the raw gas to remove heavier components via a cryogenic process. It fractionates the heavier components, which tend to be liquids, into purity products such as ethane and propane, which it sells to other customers. What's left is called residue sales gas, the object of this trial. Enterprise sells the residue sales gas to the commercial customer in south Texas–a chemical company.

The NGC8106 is a single stream analyzer with manual calibration. It has a cycle time of 12 minutes versus 5 minutes for the NGC8206. Like the NGC8206, it meets or exceeds the repeatability and reproducibility criteria of ISO and GPA standards. Real-time online data of these units avoid the data lag, transporting of cylinders, and sample handling errors associated with composite sampling.

For this trial, the company installed an NGC8106 on an 8-inch pipeline that transports residue natural gas to a commercial customer. Typical natural gas flowrates in the line range from 2 to 10 SCFD. This trial collected the NGC8106 analysis data hourly, including calculated (10-component) energy content in Btu and specific gravity over the course of three periods--April 19 to May 7, 2012; May 12 to June 8, 2012; and January 14 to February 14, 2013. The ten components analyzed to compute energy content are industry standards:

- C1 Methane
- C2 Ethane
- C3 Propane
- CO_2 carbon dioxide
- N Nitrogen
- IC4 isobutane
- NC4 normal butane
- IC5 isopentane
- NC5 normal pentane
- C6 Hexanes

April 19 – May 7, 2012	Density	BTU	C1	C2	C3	CO2	N2	IC4	NC4	IC5	NC5	C6
NGC8106 Average	0.6114	1065.6	91.7541	4.8921	1.1783	1.1175	0.557	0.154	0.2234	0.047	0.0439	0.0308
Composite Sample	0.609	1062.31	91.6458	402422	1.0303	1.0135	0.6423	0.1017	0.1355	0.0329	0.0261	0.0186
Relative % Difference		0.3	0.1	9.0	13.4	9.8	14.2	40.8	49.0	35.9	50.9	49.4

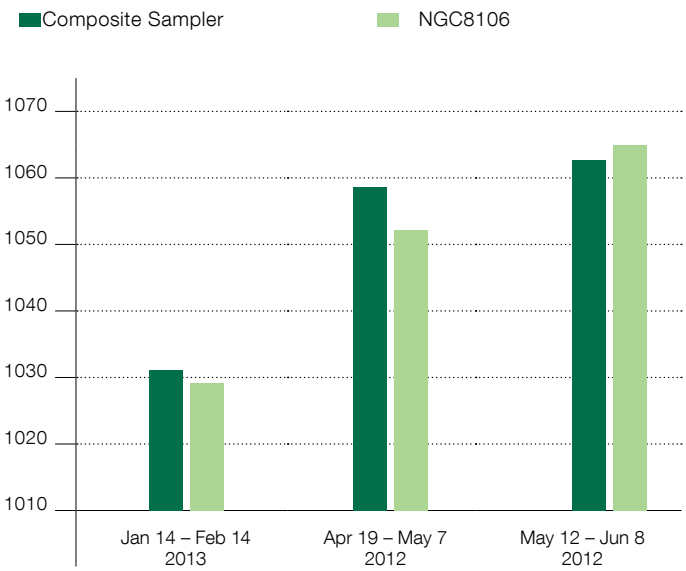
May 12 – June 8, 2012	Density	BTU	C1	C2	C3	CO2	N2	IC4	NC4	IC5	NC5	C6
NGC8106 Average	0.5961	1052.7	93.8551	3.8297	0.7637	0.7629	0.424	0.11	0.1549	0.038	0.0333	0.0286
Composite Sample	0.6007	1058.05	93.1960	4.3101	0.8176	0.7802	0.4936	0.1107	0.1509	0.0408	0.0313	0.0688
Relative % Difference		0.5	0.7	11.8	6.8	2.2	15.2	0.4	2.6	8	6.2	82.5

January 14 – February 14, 2013	Density	BTU	C1	C2	C3	CO2	N2	IC4	NC4	IC5	NC5	C6
NGC8106 Average	0.5692	1029.4	97.462	1.982	0.1559	0.1959	0.159	0.018	0.0193	0	0.0035	0.0038
Composite Sample	0.5714	1030.8	97.2626	2.0771	0.1493	0.245	0.184	0.02	0.0206	0	0.0068	0.0305
Relative % Difference	0.4	0.4	0.2	4.7	4.4	22.3	14.63	6.5	6.6		64.1	156

The results were compared to laboratory analysis of flow-weighted composite samples at the end of these periods. The relative difference between the averaged NGC8106 Btu energy calculations and the composite samples were 0.3, 0.5, and 0.1 percent for the three periods, respectively. Enterprise Products plans to conduct trials of the NGC8106 on raw gas soon.

“What stands out to me,” says Lambdin,” is the constant reliability of the NGC8106 online chromatograph. The sampler, on the other hand, requires restarting, resulting in gaps. Also, we occasionally have mechanical maintenance issues with the samplers, one of which negated a comparison period. The techniques to pressurize and flow weight the sampler are prone to human error. We consider online measurements to be more accurate and reliable.”

Calculated Energy Content, Btu



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