Keep Your LNG Feedstock Supply Clean In Natural Gas Pipelines

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The transmission of natural gas through high-pressure pipelines is not a new idea, but as the country's LNG exports grow to a world-leading level, the destination of the pipeline product and its associated requirements have changed dramatically. Traditionally, natural gas has been used to provide heat when burned, either in homes and businesses or as fuel to produce electrical power. The requirements were fairly simple, and if the gas fell within an acceptable energy range, it was considered a suitable pipeline product. Analysis of the gas for custody transfer was normally performed by an online gas chromatograph, with moisture and oxygen measurements when required.

Today, the situation is different, as natural gas is destined for liquefaction facilities designed to produce LNG for export rather than for burning. LNG liquefaction facilities cost hundreds of millions of dollars to build, and operational downtime is extremely expensive to the operators, making the acceptability of the feedstock critical. Contaminants within the natural gas that can either damage the equipment or render the liquefaction process less efficient are unacceptable. Of importance are mercury, sulfur compounds, aromatic compounds and all particulates. This article will highlight a few key differences from the perspective of gas quality and will use Freeport LNG as an example of the changing requirements within the natural gas pipeline industry.

Gulf South Pipeline applied to FERC to build the Coastal Bend Header Pipeline in 2015. It received FERC approval one year later and began construction of the pipeline in 2017. The project included seven interconnections with pipelines delivering natural gas to the Freeport LNG Development LP liquefaction terminal in Freeport, Texas. Freeport LNG's full capacity has been contracted by BP Energy Co., Chubu US Gas Trading, Osaka Gas Trading & Export and E.ON Global Commodities North America on 20-year firm transportation agreements.

The Gulf South FERC tariff specifications for the Coastal Bend Header state the receipt stations must have online monitoring equipment installed to detect oxygen; moisture; H_2S; benzene, toluene, ethyl-benzene and xylene (BTEX) components; and mercury. The equipment needs to detect deviations in real time. The variability of concentrations for both hydrocarbons and inorganic components in extracted gases can differ significantly during the operation of natural gas reservoirs. Because natural gas fields can produce large variations in levels of mercury, H_2S, aromatics, oxygen and moisture content over time, the natural gas composition blend at the Stratton Ridge delivery point to Freeport LNG may not meet the precedent agreement.

At the time the Gulf South FERC tariff specifications were put into place, there was not a viable online analyzer for mercury detection within the natural gas industry. Mustang Sampling reached out to an industry leader in mercury detection, Ohio Lumex, to build an online detection device suitable for use in natural gas. By installing online mercury analyzers at natural gas receipt meter stations, pipeline companies can protect their gas shipments from contamination. Online analyzers

at receipt meter stations also guarantee that BTEX, mercury, water, H2S and oxygen concentrations in the gas received from midstream processors remain below export contract specifications.

Mustang Sampling has completed more than a dozen integrated analyzer buildings that include mercury detection. To meet the contractual obligations of three individual natural gas purchasers, three unique bespoke systems are in place, each consisting of a Mustang Sample Conditioning System, an Ohio Lumex mercury analyzer, a BTEX (aromatic) and H2S analyzer, a moisture analyzer, an oxygen analyzer, and gas chromatographs for energy measurement to create a complex analyzer package.

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