



liquids product stream is then sent to a natural gas liquids plant for further separation or is sold to a chemical plant as feedstock.

With the natural gas liquids removed from the stripping oil, it is recycled to the top of the absorption tower and any demethanizer towers as needed. It is also common to cool the stripping oil first through refrigeration to help the stripping oil perform better.

**Improving Unit Performance with Process Gas Chromatographs**

The first two analysis points for process gas chromatographs (AX #1 and #2 in Figure 1), are a good example of using gas chromatographs for providing information on the plant's material balance. Part of the economics of the gas plant is to determine the BTU shrinkage across the plant. Measuring the BTU of the feed stream and then the residue product stream allows the BTU shrinkage to be calculated. The third analysis point (AX #3 in Figure 1) measures the

absorption tower bottom streams for C<sub>1</sub> and C<sub>2</sub> to get maximum recovery of the C<sub>2</sub> without getting too much of the C<sub>1</sub> as an impurity. The natural gas liquids stream may be measured (AX #4 in Figure 1) for the C<sub>3</sub>, C<sub>4</sub> and C<sub>5</sub> content if it is being sold to a natural gas liquids plant.

On occasion, some plants have measured the stripping oil recycle stream for C<sub>4</sub>s and C<sub>5</sub>s compounds (AX #5 in Figure 1). Measurement of these compounds can give an early indication of the chemical decomposition of the stripper oil. A summary of these applications can be seen in Figure 2.

**The Emerson Solution**

Emerson has a long history of providing process gas chromatographs for the natural gas industry. Emerson's process gas chromatographs set the standard for on-line process measurement by supplying analyzers that are both robust and capable of handling the analytical requirements.

Analyzer #	Stream	Components Measured	Measurement Objective
1	Raw natural gas feed	Total (BTU)	Used to calculate BTU "shrinkage" across the plant
2	Absorption tower bottoms	C <sub>1</sub> , C <sub>2</sub>	Optimize control of the absorption tower
3	Residue gas product	Total (BTU)	Used to calculate BTU "shrinkage" across the plant
4	Rich oil still overheads	C <sub>1</sub> - C <sub>6</sub> +	NGL product purity
5	Stripper oil recycle	C <sub>4</sub> 's, C <sub>5</sub> 's	Monitor for chemical decomposition of the stripper oil

**Figure 2 -Summary of Process Gas Chromatograph Applications in a Typical Absorption Plant**

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