

## How column diagnostics improve the availability and efficiency of your plants

### *Part 3: Increasing energy efficiency*

Distillation plants are high-energy-consuming facilities. In the current economic situation, energy costs have an even greater impact. Column diagnostics help in finding energy-saving potential.

A crucial aspect of maximizing energy efficiency is ensuring optimal operation of the plant. If the plant shows deficiencies, such as failure to achieve product quality and/or yield, parameters are adjusted, which can increase costs, such as

- increased steam input,
- increased reflux, resulting in more liquid needing to be vaporized.

By increasing pressure, steam volume can be reduced. However, this impacts the static load on the column shell and its periphery, thus affecting the lifespan of components.

By reducing vacuum pressure, better evaporation can be achieved at lower temperatures, but physical limits and the cost factor must be considered.

Both measures can lead to excessive liquid and vapor loads that can flood the column. This needs to be avoided. Limiting flow rates can lead to situations in which, to achieve the required quality, the product must be temporarily stored in a vessel before later being reintroduced into the process. This increases specific energy costs significantly.

Our column diagnostics services can determine whether the plant is operating at its optimal operating point. We assess whether the internals are in good mechanical condition and whether fluid dynamic anomalies such as liquid entrainment, flooding of the active tray area or downcomer, or maldistribution are present.

The initial on-site evaluation provides insights into,

- the presence of the described anomalies in the internals,
- whether too much liquid is entrained,
- the liquid level in the sump and its correlation with internal level measurements,
- whether, in columns with multiple feed points, this area is partially hydraulically overloaded due to insufficient feed temperatures.

Conclusions about the degree of fouling of the internals can be drawn by correlating the results of the hydraulic calculations with the scan results.

The advantage of gamma scanning technology for the operator is that the measurement is carried out during operation. With the insights gained, we can help you optimize energy efficiency and reduce costs.

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