Optimization of Separation Processes

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OPTIMIZING YOUR WORLD

Sector: Multiple

Why chose **ORTO** for this application?

There are many challenges to using traditional real-time optimization technologies on separation units:

- The available savings are low relative to the implementation and maintenance costs
- Process dynamics can be highly non-linear and hard to model

ORTO schemes are easy to design and implement, significantly reducing the time, cost and expertise needed. They also handle non-linearity implicitly, significantly reducing maintenance needs.

Business Objective

Separation units are commonly found on process plants. Examples of separation methods include distillation, solvent extraction, filtration and floatation. In most instances there is a trade-off between energy use and separation efficiency. Maximum operating profit is usually achieved by minimizing energy used to deliver the desired purity of separation.

Typical Optimization Objective Function

Minimize energy used, per unit feed.

By manipulating, within a permitted range:

- Energy input e.g., steam to a reboiler
- Flow rates within the unit e.g., reflux flow
- Operating pressure

Subject to the following constraints:

- Product quality limits
- Equipment hydraulics, e.g., ΔP to infer column flooding limits
- Heat transfer limits e.g., steam valve position

Solution

On small separation units, 3-5 agents will be sufficient. On larger multi-product separation processes more than 10 agents may be required.

Benefits

The minimum benefit will usually be a 3-10% reduction in energy use. In some cases, there can be yield benefits of up to 5%.