Optimization of a Crude Distillation Unit

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Sector: Refining

Why chose **ORTO** for this application?

The process is non-linear and non-stationary i.e. process dynamics change over time as crude changes occur and equipment fouling takes place. Traditional model-based RTO technologies can be challenging for such applications as they require costly initial engineering and extensive ongoing upkeep to maintain performance.

ORTO schemes however are easy to design and implement, significantly reducing the time, cost and expertise needed. Their self-learning nature implicitly handles non-linearity. Thus, yield and overall unit optimization is maintained without any ongoing upkeep burden.

The technology is also very scalable, enabling the optimization scheme to be expanded easily over time to achieve increased benefits.

Business Objective

Crude distillation units separate crude oil into distillate products for further processing.

Typical Optimization Objective Function

Optimization of crude distillation unit consists of one or more of the following:

1. Optimizing product cut-points usually up to product quality, hydraulic and temperature limits.
2. Optimizing heater outlet temperature and pump-around duty splits to optimize yield versus energy use.
3. Optimizing stripping steam and column pressure.
4. Optimizing feed split in preheat trains to maximize heat recovery
5. Maximize feed rate.

Solution

On a typical crude distillation unit, 12-16 agents will be needed.

Benefits

Increased yield of higher value products, increased throughput (when required) and improved yield versus energy trade off.