

DATA MANAGEMENT

IN PROCESS PERFORMANCE VALIDATION

Assess performance using large production datasets

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Tens of thousands of data points can present a challenge of how these can be viewed and analysed to yield meaningful information. Our InProcess software application aims to simplify this process.



Distillation products

Complex Data

The process industry collects large and complex historical datasets. There are many interactions between variables which are not easily interpreted.

The quantity and noise from unrepresentative operations, such as process upsets and malfunctioning instrumentation, create a challenge to unlocking valuable information that can be used to improve performance.

Our InProcess application can reduce the complexity of large datasets offering the user an interface of easily accessible plots and summary tables with trends and correlations.

Features such as missing data, constant values, faulty sensors and questionable values can be analysed through the system.

Intertek InProcess

Our proprietary technology InProcess is designed to assist our clients in cleansing and ordering historical data to gain valuable information that may positively impact processes and profit.

When analysing data and making decisions based on variables, operations usually focus on first-order, i.e. the most obvious, effects.

For example, flow rate into a vessel on a platform is known to have a direct effect on its fluid level, whereas the pressure sensors on a compressor would typically not be considered. However, pressure drop across a compressor is indicative of compressor efficiency which, in turn, has an effect on separator levels.

In refineries, the flow rate of medium gas oil (MGO) is a function of many parameters such as reflux ratios, reboiler heat load and temperature of the feed - all first-order effects.

However, there are other factors affecting this which would not be directly linked to MGO production such as the temperature of the desalter or the temperature of a slops stream being added to the crude blend.

Both have an effect on CDU feed temperature.

Functions and Benefits

The many functions and benefits include:

- Advanced data analysis tools to expose the underlying structure of complex datasets
- Expose underlying trends and correlations
- Snapshot of process data, showing representations of process operation for specific time horizons
- Analyse the whole dataset, showing combinatorial effects of process variables
- Assess underlying effects on processes
- Identify potential problems that could negatively impact margins

Key Process Variables

InProcess can import large datasets from data historians. It then gives the user an interface, consisting of plots and summary tables, to view this data.

To maximise value from this, it is key to understand outliers and 'clean' datasets before additional analysis such as process modelling and optimisation.

InProcess allows the user to examine the data and visualise any that may be missing, constant values, faulty sensors and questionable values.

InProcess plots can be used to identify process outliers by looking at combinations of process variables.

Operating Regions

InProcess allows the user to visualise operating regions drawn from snapshots of the combinations of operating variables at a particular time horizon.

Following identification, they can be correlated to key process variables. Operating regions can highlight process nuances such as decreasing process unit efficiency, shift changes and changing crude blend composition.

Key Process Variables

InProcess takes large datasets, displays their underlying trends and shows the variables which have maximum effect. It can pick out relationships caused by combinations of variables and other underlying effects as well as first-order relationships.

However, process data is complex, and there are many interactions. Statistical analysis uncovers the underlying combinatorial effects by selecting a target/objective function based on process requirements, for example, maximising flow-rate, minimising oily water overboard or maximising the production of diesel.

FOR MORE INFORMATION



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