KBC
A Yokogawa Company

Petro-SIM™ HX Monitor

Heat Exchanger Monitoring

In a typical 100 kbpd refinery, online cleaning costs and increased energy usage associated with fouling can result in incremental expenses of $1 million per year. Planning a cleaning schedule using HX Monitor can help refiners avoid these costs. A typical payback is 4-6 months.

Improve Refinery Profit Margins

To avoid these lost opportunity costs, you need to monitor fouling and optimise cleaning. While monitoring individual exchangers can help, the best approach is to simulate the entire heat exchanger network and different stages of fouling in a crude pre-heat train.

Monitoring the amount of fouling over time for each exchanger and the whole network enables you to identify sudden fouling events. It also removes hindrances to increased throughput due to fouling by eliminating furnace and pump bottlenecks.

Identifying which exchangers to clean and when allows you to choose the best exchangers to clean if an opportunity suddenly arises, such as an unscheduled shutdown. HX Monitor also has “what-if” analysis so you can prioritise the exchangers to clean in a turnaround, and if you add in the cost associated with fouling a potential payback can be assessed.

Is your crude unit currently being limited by heat exchanger fouling?

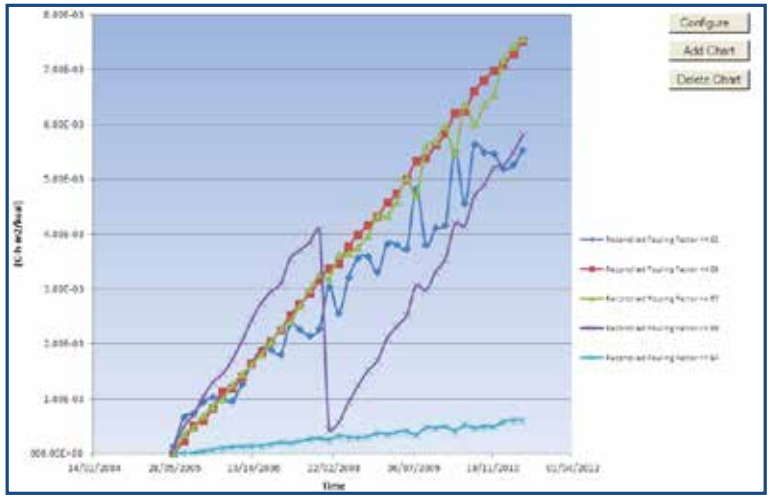
How do you currently select which preheat exchangers to clean and why?

Do you track the impact of cleaning a heat exchanger in your crude pre-heat train?

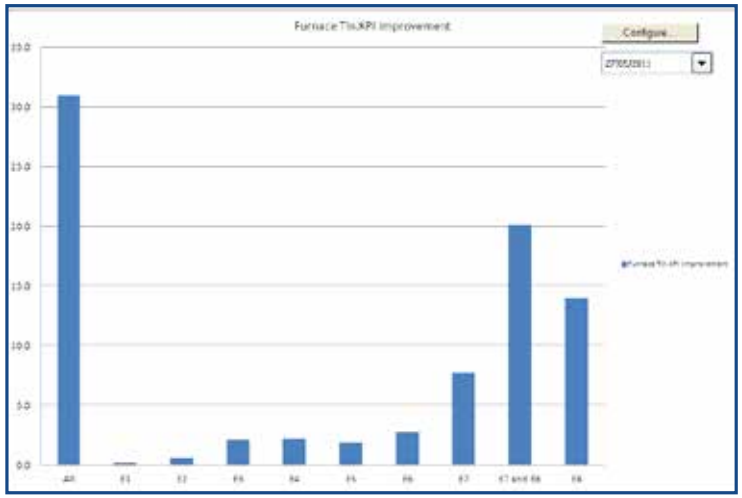
Improve Accuracy with Petro-SIM Base

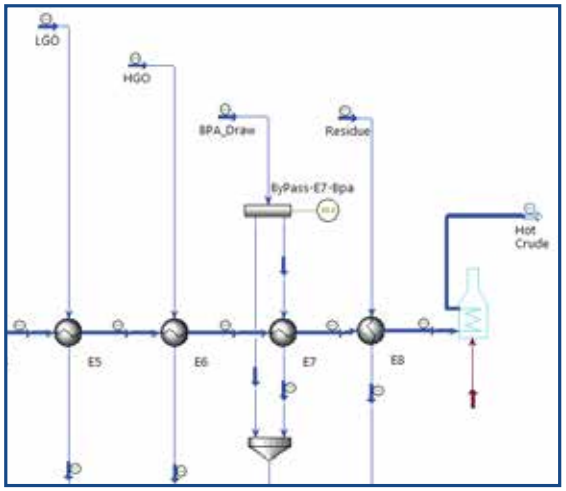
Because of its integration with the Petro-SIM simulation platform, HX Monitor has a built-in monitoring toolset with optimisation-based data reconciliation and full thermodynamic properties on all streams across the network, improving accuracy with rigorous network simulation.

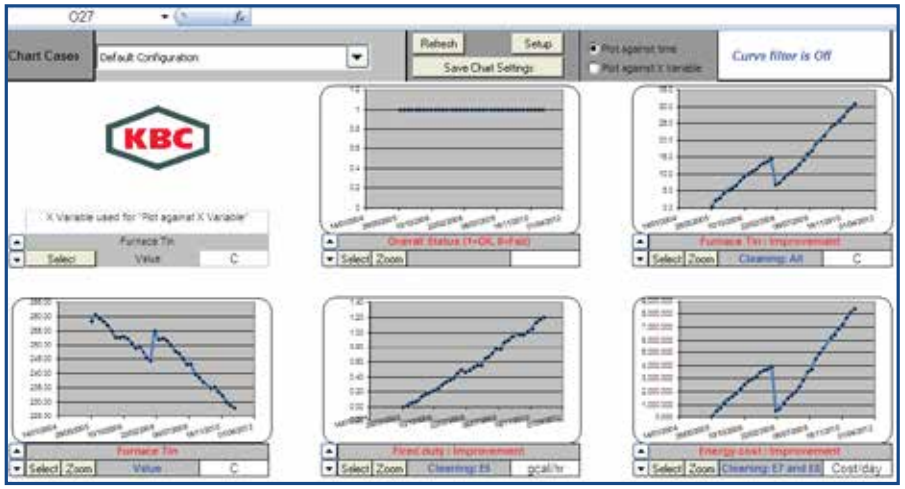
By monitoring the entire network of exchangers, simulation shows all interactions within the preheat train. Rigorous VLE simulation also involves column, desalter and preflash modelling.



Paybacks for cleaning single, multiple and the entire set of exchangers







Choice of flowsheet view or automatically-generated Excel interface

HX Monitor is a reusable model for other operation and revamp studies, such as crude evaluation, throughput studies, revamp projects and pressure drop.

An Integration Solution

Since KBC's HX Monitor operates within Petro-SIM, it is a full commercial software, upgradable and future-proof for operating system and software changes.

Petro-SIM also allows the model to run automatically on a regular basis, providing you with accurate and up-to-date information on which to make a decision. Results are exported to a database, and can also be written back to the site data historian.

As an integration solution, HX Monitor provides workflow integration and collaboration at all levels and functions, increasing refinery profitability. By using HX Monitoring with typical work processes, you can achieve Best Practice Fouling Monitoring.

Refinery Saved Over $2 Million/Year

A North American 300 kbpd refinery installed KBC's heat exchanger monitoring software and had immediate results. Following a brief shutdown during which the exchangers were cleaned, one crude unit increased throughput and transfer temperatures back to normal conditions. After a typical start-up, an unscheduled shutdown led to significant fouling in several exchangers.

Using KBC's software to analyse the event, it was possible to pin-point the exact time frame that the incident occurred, the exchangers that fouled, how much fouling had occurred and the value to the refinery of cleaning the fouled exchangers.

Because they were able to quickly analyse the situation, the refinery planned an opportunity cleaning for the three fouled exchangers during a refinery slow-down.

The estimated savings in energy cost alone was $2 million/year, and throughput offered much greater savings.

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HX Monitor Online