



INEOS

**European Refiner Tackles
Heat Exchange Issues and
Saves Millions in the Process**



“This application was quickly accepted by the manufacturing engineers because of its ease of use and the relevance of the simulation results and recommendations.”

– Pierre Sere Peyrigain, INEOS

\$4M
(USD) / Yr savings

CHALLENGE

Fouling of the heat exchange system disrupts operation and affects productivity and revenue goals.

SOLUTION

Aspen HYSYS® and Aspen Exchanger Design and Rating (EDR) were used to model the heat exchange system and simulate fouling behavior to identify issues earlier.

BENEFITS

- Saves INEOS \$1.5 million to \$2 million per VDU; total of \$4 million per annum
- Enables INEOS to implement smart tube cleaning timetables to minimize maintenance cost and downtime
- Ensures more predictable, reliable operations
- Integrates easily with other systems, such as Aspen InfoPlus.21® for deployment at other plants worldwide

As Europe's leading independent crude oil refiner, INEOS processes more than 410,000 barrels of crude oil per day. Their production network spans 76 manufacturing facilities in 20 countries around the world. INEOS' success is linked to a simple approach to business — a focus on customer satisfaction, total quality and reliability.

When INEOS set its mission toward continuous improvement to become a low-cost producer of high-quality products, the heat exchange system became a priority because of its impact on productivity, costs and overall profitability. Fouling in each heat exchanger and the entire heat exchanger train is a common problem for refineries. Without proper monitoring and insight, refiners resort to reactive rinsing and cleansing operations, significantly disrupting the safe, efficient operation of plants — and costing them millions of dollars in lost revenue.

Making Performance More Predictable

The INEOS Lavéra facility is capable of processing multiple types of crudes, but is nonetheless challenged by production disruptions such as fouling of its heat exchangers.

Today's variety in crude oil supply leads to changes in flow rate and composition that have a major influence on heat exchanger fouling. This can affect operational performance by limiting capacity and increasing energy consumption.

While manufacturing engineers must often contend with the inevitability of fouling, INEOS set out to build a decision-support system to address this in a more predictable manner and improve plant availability.

These operational efficiencies resulted in an annual benefit of \$1.5 million to \$2 million per vacuum distillation unit (VDU) and a total of \$4 million per annum to the bottom line.

Innovative Modeling Anticipates Problems in Advance

INEOS created and implemented an automated fouling monitoring application utilizing Aspen HYSYS, Aspen EDR, and Microsoft Excel for visualization of the data. The ability to link the AspenTech solutions with Excel allowed INEOS to distill complex and rigorously processed data and render it in user-friendly, easy-to-read graphical output.

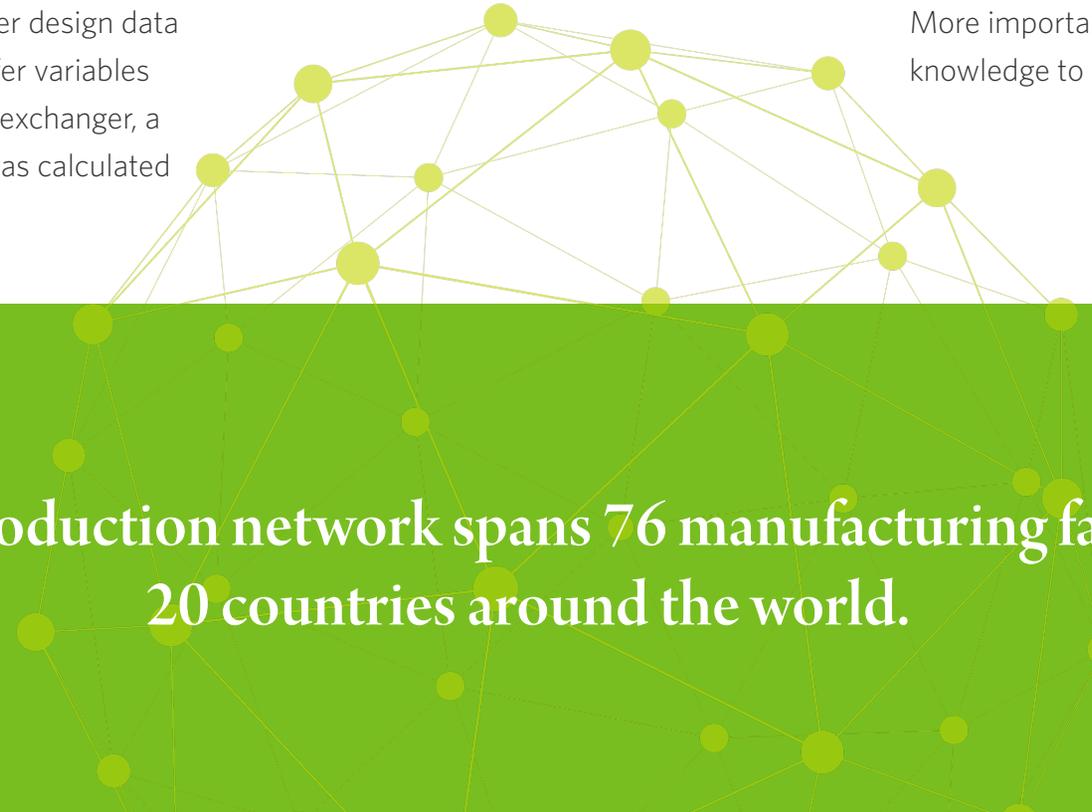
Temperatures, flow rates, process stream characteristics, and heat exchanger design data were used to calculate heat transfer variables for the exchangers. For each heat exchanger, a clean heat exchange coefficient was calculated

and compared to the actual (fouled) heat exchange coefficient. INEOS monitored this ratio between the coefficients and could, as a result, effectively assess the performance of the system, allowing the manufacturing team to consider and implement various cleaning scenarios that optimized production efficiencies.

A More Reliable, Productive Plant Saves INEOS \$4 Million

These operational efficiencies resulted in an annual benefit of \$1.5 million to \$2 million per vacuum distillation unit (VDU) and a total of \$4 million per annum to the bottom line. INEOS achieved more reliable and stable operations, increased the ROI on existing technological investments and improved profitability.

Since its rollout, INEOS has expanded the application to include the crude distillation unit. More importantly, INEOS is transferring this knowledge to other plants and sites worldwide.



INEOS' production network spans 76 manufacturing facilities in 20 countries around the world.

AspenTech is a leading software supplier for optimizing asset performance. Our products thrive in complex, industrial environments where it is critical to optimize the asset design, operation and maintenance lifecycle. AspenTech uniquely combines decades of process modeling expertise with machine learning. Our purpose-built software platform automates knowledge work and builds sustainable competitive advantage by delivering high returns over the entire asset lifecycle. As a result, companies in capital-intensive industries can maximize uptime and push the limits of performance, running their assets faster, safer, longer and greener.

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