Case story

Performance Audit optimizes the steam cracker of a global petrochemical company in Antwerp, Belgium

Nine Alfa Laval M30 units are responsible for cooling down the process water of the steam cracker.

"Over the years, this global petrochemical company has continuously optimized its steam cracker plant in Antwerp, Belgium because every additional 0.1 % improvement counts," says Stijn Moolenaar, Outside Sales Engineer, Alfa Laval Benelux. "Which is why the customer came quickly on board when we recommended an Alfa Laval Performance Audit Gasketed Plate Heat Exchanger to determine exactly how each of the nine titanium plate heat exchangers cooling the steam cracker process water was performing."

Analyzing actual data to determine plate condition

When Alfa Laval approached this customer about the Performance Audit, the customer was unable to assess the individual performance of its heat exchangers. "For optimum output, each unit has to perform equally," says Moolenaar. "But we suspected this wasn't the case – in part because of uneven fouling caused by the brackish water from the Schelde River being used as cooling water. We offered a Performance Audit to collect and analyze data on actual operating conditions and determine the state of the plates – without opening the units."

The audit confirmed that performance was uneven and far from optimal.

Bringing each and every heat exchanger up to speed

While each of the units was designed to house 493 plates, the reality was that some units had fewer. Some units had a mixture of high-theta and low-theta plates, making it virtually impossible for each heat exchanger to perform equally and thereby deliver optimal performance.

"The gaskets were near the end of their lifetime. This could cause unplanned maintenance of the units. Therefore, we concluded together to take this opportunity to perform a complete Alfa Laval Reconditioning Gasketed Plate Heat Exchanger in our Alfa Laval Service Centre in Waalwijk (NL). This included gaskets change, chemical cleaning of all plates and a plate integrity inspection. We then brought the plate number up to 493 for each heat exchanger and replaced low-theta plates with high-theta plates to improve the performance," says Moolenaar.

Working around the clock to beat the heat

Because sufficient cooling is critical to the performance of the plant, the heat exchangers could only be taken out of service during the colder months of the year – and then only one unit at a time. Each unit had to be up and running again within one week.

"To ensure fast turnaround, we used Alfa Laval Exclusive Stock to guarantee availability of high-theta plates during the entire process," says Moolenaar. "We began the reconditioning process in March and then stopped two weeks before the summer. We started reconditioning again in October and then put the last heat exchanger back in place in January the year after."

Fast facts

The customer

With over 133,000 employees and sites around the globe, this customer is one of the world's largest suppliers of petrochemicals. Part of the Antwerp site, the steam cracker plant is one of the largest facilities of its kind in Europe.

The challenge

Ensure that nine titanium plate heat exchangers used for cooling process water run reliably and perform optimally and equally.

Reduce maintenance costs

Eliminate unnecessary downtime caused by performing maintenance on a fixed schedule.

The solution

Conduct a Performance Audit and Reconditioning on nine Alfa Laval M30 plate heat exchangers with titanium plates. Subsequent fine-tuning based on an additional Performance Audit. Regular Performance Audits to ensure continued performance and just-in-time maintenance.

The benefits

Insights on the performance of each individual M30 plate heat exchanger. Optimal heat exchanger performance, which increases total output of the installation. Reduced annual maintenance budget by conducting the right maintenance at the right time.

Afterwards, another Performance Audit was carried out in order to fine-tune the units and ensure each unit delivered the same performance.

No more guesswork saves maintenance – and plates

Before the Performance Audit and Reconditioning, the customer performed chemical cleaning on a yearly basis based on past history. The company never knew for sure if they were cleaning too much, too little, or even too late to prevent the plates from becoming irreversibly fouled.

The next step is an Alfa Laval Performance Agreement that provides periodic auditing of the heat exchangers and Cleaning-in-Place can be conducted only when required.

"This will save our customer money on unnecessary cleaning – and increase the lifetime of the heat exchangers by ensuring that they are cleaned before plate fouling is irreversible," says Moolenaar.

Optimal performance all the time

"And finally," continues Moolenaar, "the customer can rest assured that their heat exchangers are providing optimal output at all times – which can only result in increased production output and cost savings on maintenance over time."

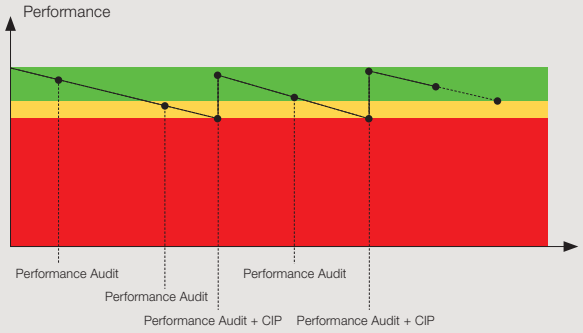
About Alfa Laval Performance Audit

Alfa Laval Performance Audit is a monitoring service for plate heat exchangers. By monitoring the current operational conditions of a heat exchanger using a portable logger and our unique AlfaCheck software, Alfa Laval can determine the actual performance in terms of heat load without opening the unit. We then make recommendations about what type of service is required and when to perform it. Through regular monitoring, Alfa Laval can also predict the condition of heat exchangers in the future and plan maintenance accordingly.

Colour	Performance level	Action
Green	High	No action required
Yellow	Medium	Time to plan cleaning
Red	Low	Schedule cleaning as soon as possible

Based on monitoring of actual operating conditions and analysis of the data collected, a Performance Audit determines what action – if any – is required.

To monitor the performance of a plate heat exchanger, Alfa Laval needs to know the actual inlet and outlet temperatures for both fluids and the actual flow for one of them. Without disrupting operations, an authorized Alfa Laval service engineer affixes four temperature gauges and one flow gauge to the outside of the heat exchanger pipes and collects data using a portable logger. The data is then analyzed with AlfaCheck software and a report is generated. Based on this report the customer can decide how and when to service the plate heat exchanger.



How to contact Alfa Laval

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