



Northern Europe Refinery Saves EUR 10 Million/Year

Digital twin maintains refiner's competitive performance

Key Benefits

- Saved EUR 10 million/year
- Improved feedstock selection
- Created a more accurate FCC LP sub model

Background

- Refinery looking to keep competitive edge
- Increase engineer knowledge on model simulation development

KBC Solution & Results

- Customized KBC coaching and mentoring program
- Digital twin designed with Petro-SIM with FCC-SIM
- Increased engineer modeling knowledge

Client Challenge

A refinery in Northern Europe wanted to keep their competitive edge. The operator had recently purchased fluid catalytic cracking (FCC) units and wanted to maximize their investment. They were looking for long-term tools and interested in using simulation software. The operator thought that creating digital twins would be the ideal effort to support their goals.

However, the operator was concerned that the value of their technology investment would be unsustainable due to lack of employee capability, previous poor software experiences, and limited formal technology work processes. They needed more than just software. The refiner wanted to empower their people with the necessary knowledge on how to create models and maintain their culture of continuous improvement.

After reviewing several companies, the operator decided to use KBC. The tipping factor was that KBC's consultants not only knew how to use the software, but also had hands-on experience in working in refineries and understood the issues they were facing.

The Solution

After several on-site consultations, KBC provided a customized solution that met the client's needs, timescales, and goals. Since the client wanted more than just software, the KBC consultants would give the operator hands on guidance from beginning to end. This included guiding the operator from data connectivity through designing a digital twin to the hands-on training and procedure



updates needed for value sustainment.

The client wanted to prove the solution and focussed their efforts on the critical fluidized catalytic cracking (FCC) unit. Starting at this complex unit the client team did as much of the work as possible with a dedicated KBC consultant and software specialist mentoring and coaching where needed.

Over a 12-month period, KBC visited the operator 8 times. In addition, there were off-site support days for urgent

questions, remote guidance, and back up work. This way of working ensured that the operator's engineering staff built up their own modeling expertise.

During the project, KBC trained the engineers on various modeling techniques. These included, how to improve the data from test runs, performance monitoring, building models, calibrating models, structured interfaces, improving model accuracy, how to establish models fit for purpose, LP table generation, and value delivery.

Results

During the first year, the operator built a digital twin of the FCC unit and gas plant. This included design level detail of equipment, such as columns, exchangers, compressors, and pumps.

The operator uses this digital twin to enhance performance monitoring of all equipment including pump and compressor curves. The operator runs the digital twin model on a weekly basis to ensure the refinery runs optimally.

The operator identified EUR 10 million/year of savings. They improved the feedstock selection by using a more accurate FCC LP sub model.

KBC scaled the technology into the refinery. The operator found additional value and sustained on their other units with KBC continuing to work with them, guiding and mentoring as necessary.

KBC provided more than software to the refinery, they built a relationship. The operator continues working with KBC based on the mentor and consulting agreement with reduced number of visits per year.



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