Compañía Española de Petróleos (CEPSA) Streamlines Scheduling Workflows With Integrated Refinery Scheduling and Blending

aspentech | Case Study

"Aspen Petroleum Scheduler and Aspen Refinery Multi-Blend Optimizer helped streamline our scheduling workflows and provided CEPSA with an accurate representation and prediction of refinery performance."

- Maria Mateos-Camacho,
Planning-Scheduling Department, CEPSA

Reduced quality giveaway

70%

CHALLENGE

CESPA wanted to create a solution that would involve various business units in a coordinated way to optimize the global margin by establishing an integrated management model.

SOLUTION

Replaced home-grown spreadsheets by integrating Aspen Petroleum Scheduler™ and Aspen Refinery Multi-Blend Optimizer™ with Aspen PIMS™

BENEFITS

- Reduced gaps between planning and scheduling by 90 percent
- Reduced quality giveaway by 70 percent
- Reduced demurrage costs by 20 percent

Compañía Española de Petróleos, S.A.U. (CEPSA) is an integrated energy company operating at every stage in the oil and gas value chain. Headquartered in Madrid, Spain with more than 10,000 employees, CEPSA is the fourth-largest industrial group in Spain. The company has over 90 years of experience in the development of large-scale projects in different phases of the oil and gas value chain, both nationally and internationally.

The company is engaged in petroleum and natural gas exploration and production activities, refining and the transport and sale of crude oil derivatives, petrochemicals, gas and electricity. Thanks to its flexibility and ability to adapt, CEPSA has become a benchmark company in its sector in Spain. The company operates on five continents through progressive internationalization of its activities, with business interests in several European countries as well as Algeria, Brazil, Canada, Colombia, Panama, Peru and Portugal.

Journey to an Integrated Refinery Scheduling and Blending Solution

CEPSA is a company that prides itself on having innovation its DNA. They use technology and research to create value, be more competitive, optimize processes and improve the efficiency and quality of products. Since 2011, CEPSA has been looking for new business opportunities to improve their processes while maximizing total margins. With this intention, a new project was born with a common goal of all business units working in a coordinated way to optimize the global margin through an integrated management model. The original project was divided into 17 sub-projects according to functional domain.

Prior to the corporate initiative to improve the business processes in CEPSA, schedulers had been using homemade tools based on Excel files that were managed and reported by each individual scheduling stakeholder in a refinery. Since this method of scheduling provided no collaboration, there was little to no interaction among schedulers, causing inefficiencies and lost opportunities within CEPSA's refineries to execute on the optimal plan. Additionally, because the spreadsheets were standalone, they provided no integration with Aspen PIMS (CEPSA's planning solution since 2014), creating siloed departments and a disconnect between planning and operations.

Why AspenTech?

CEPSA was looking to improve their scheduling workflows and business processes at their La Rábida and Gibraltar-San Roque refineries. After review and deliberation, the decision was made to move forward with AspenTech as the vendor for their refinery scheduling and blending solution.

AspenTech already had a long-standing strategic partnership with CEPSA, providing solutions in petroleum supply chain to their organization. The integration of Aspen PIMS with Aspen Petroleum Scheduler and Aspen Refinery Multi-Blend Optimizer would provide CEPSA with shared common assay data, unit sub-models, blending correlations and planning targets (key process indicators, or KPIs). Another driver was the integration between rigorous models with Aspen HYSYS®, planning models in Aspen PIMS and scheduling with Aspen Petroleum Scheduler and Aspen Refinery Multi-Blend Optimizer.

These capabilities and features aligned with the corporate objectives to automate and integrate the different processes in the planning cycle.

Implementing Aspen Petroleum Scheduler and Aspen Refinery Multi-Blend Optimizer

CEPSA implemented AspenTech refinery scheduling and blending solutions at both the La Rábida and Gibraltar-San Roque refineries sequentially. A phased approach was taken in a four-step process that took approximately 12 months per site (Figure 1). In the first phase, CEPSA took the time to fully understand what they wanted to schedule to better define the scope of the two projects. Meetings were held with key scheduling stakeholders to determine what was needed in the day-to-day scheduling of each refinery.

Next, they entered the second phase of the project and began to lay out the fundamental design of how the problem would be modeled in Aspen Petroleum Scheduler and Aspen Refinery Multi-Blend Optimizer. CEPSA took the time to understand the schedulers' needs and find the key areas where improvements and profit could be gained, which included automatic logics and stream routing.

One example of this was using standard Aspen Petroleum Scheduler functionality to determine the optimal feed distribution and a linear program optimization for diesel blending that included all relevant process units in the refinery. Another key modeling improvement was the creation of a crude mix optimizer that helps schedulers push the limit of crude units for additional profit by maximizing operational constraints and throughput.

After the fundamental design phase, CEPSA began an incremental testing approach by first defining a scenario and test using AspenTech software. This partial-testing approach lasted approximately seven months, until each aspect of the scheduling model was reviewed by CEPSA and met all their schedulers' needs. Once the model had been fully built and tested, schedulers were up to speed on Aspen Petroleum Scheduler and Aspen Refinery Multi-Blend Optimizer within a month of deployment.

While the implementation process was happening, CEPSA worked closely with their IT department to ensure the project was successful and fit their business needs. This included enabling a link to communication from AspenTech software and their most relevant systems, such as production management, ship movement management and oil movement.

Figure 1: Phased approach process

Benefit Summary

Aspen Petroleum Scheduler and Aspen Refinery Multi-Blend Optimizer are now embedded and critical to CEPSA's business processes in La Rábida and Gibraltar-San Roque refineries. AspenTech's refinery scheduling and blending solutions have provided a comprehensive refinery-wide view of the schedule, from crude receipts to product shipments, enabling schedulers to make more informed and quicker scheduling decisions. This improved visibility into the true operations has saved schedulers time gathering information and inputting data, allowing more time for analyzing to make the most profitable decision.

Additionally, the multi-user environment and streamlined workflows from the integration of Aspen PIMS, Aspen Petroleum Scheduler and Aspen Refinery Multi-Blend Optimizer has increased efficiency and improved accuracy. Some of the most significant benefits include:

- Reducing the gap between planning and scheduling by 90 percent
- Reducing quality giveaway by 70 percent
- Reducing demurrage by 20 percent

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