Refinery Optimizes Middle Distillate System in Real Time with Aspen GDOT™

Reduced giveaway:

Sulfur:
70%

Diesel T90:
80%

Jet smoke point:
25%
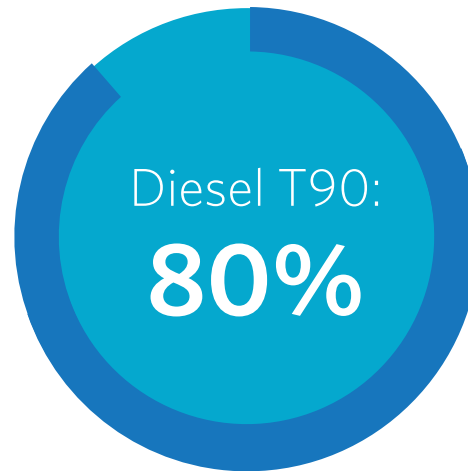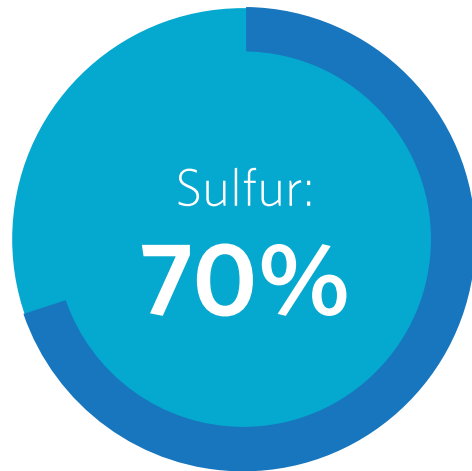
CHALLENGE

The refinery wanted to optimize production of diesel and jet products while staying within certain specifications. The refinery's complex system included many different units.
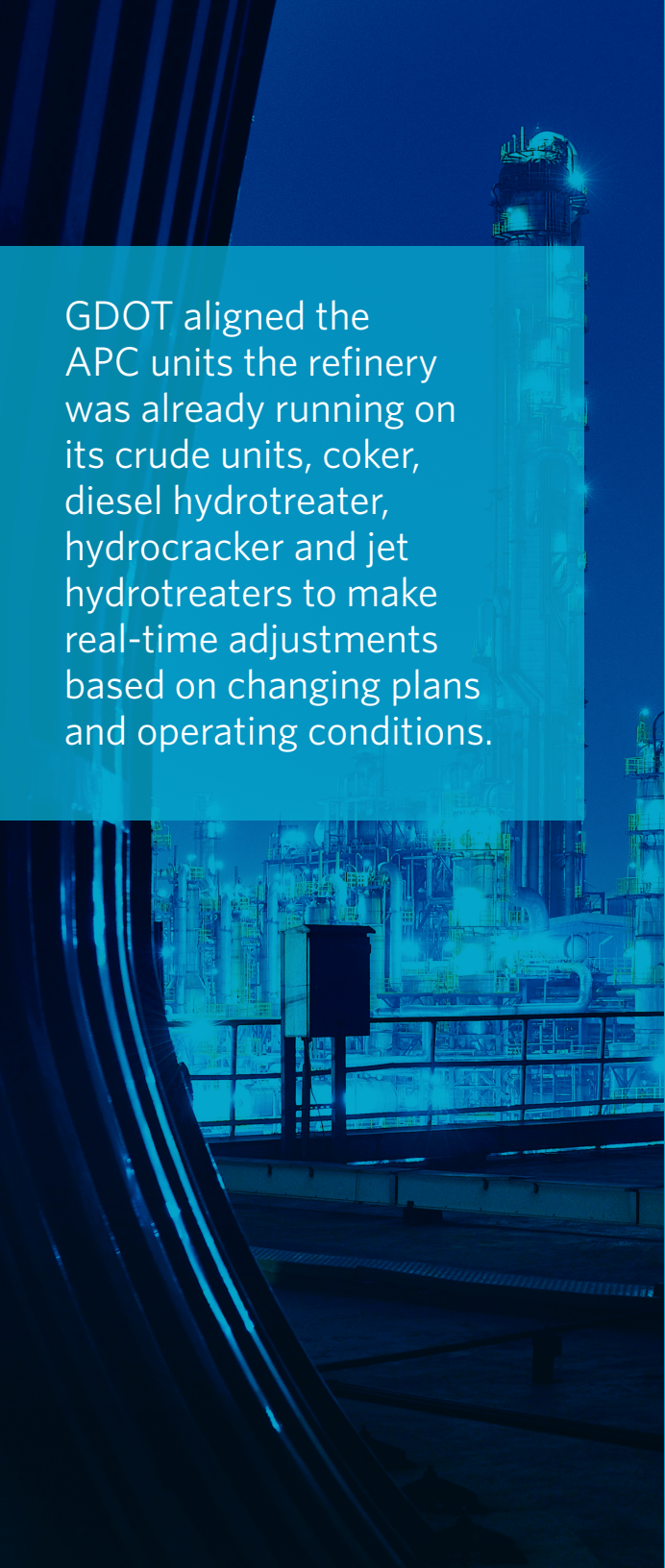
SOLUTION

Using Aspen GDOT, the refinery increased diesel and jet production and reduced product giveaway, optimizing for multiple properties simultaneously.

BENEFITS

Real-time optimization across multiple APC units delivered significant value:

- 70% decrease in sulfur giveaway
- 80% reduction in diesel T90% giveaway
- 25% decrease in jet smoke point giveaway

One of the world's largest multinational energy companies saw an opportunity to maximize production of specific diesel and jet fuel products at one of its refineries. Though the refinery already had multiple advanced process control (APC) units in place, company leaders recognized they could further optimize and increase margins.

The refinery wanted to improve diesel production while staying within specifications on sulfur properties and 90% distillation point. The refinery also wanted to increase production of jet that met certain smoke point, freeze point and flash point criteria.

> GDOT aligned the APC units the refinery was already running on its crude units, coker, diesel hydrotreater, hydrocracker and jet hydrotreaters to make real-time adjustments based on changing plans and operating conditions.

Optimizing Across Multiple Units with GDOT

The refinery implemented General Dynamic Optimization Technology (GDOT) that aligns multiple process units (and each individual APC controller) with the refinery plan and actual operating conditions.

In addition to adopting new technology, the company changed their organizational approach, creating a multi-function refinery optimization center, bringing together console operators, optimization engineers, process control engineers and planners. Uniting staff from across the plant in a centralized location allowed the company to make even better use of its new integrated technology.

The company started small, initially optimizing the diesel envelope, then expanded to the remaining middle distillates.

Taking the crude plan, tank lineup, planning strategy and other factors into consideration, staff used the refinery's LP model and APC models to create the model for Aspen GDOT. Aspen GDOT was able to calculate the properties for all streams in the middle distillate envelope. The refinery used this insight for analyzer validation. In addition, keeping track of intermediate tank properties allowed the refinery to make more accurate scheduling decisions.

Aspen GDOT aligned the APC units the refinery was already running on its crude units, coker, diesel hydrotreater, hydrocracker and jet hydrotreaters, as well as stream routing and fuel imports into final blends to make real-time adjustments based on changing plans and operating conditions.

Results: Higher Profits Across Multiple Products

This approach enabled the plant to reduce product giveaway resulting in overall higher margins:

- 70% decrease in sulfur giveaway
- 80% reduction in diesel T90% giveaway
- 25% decrease in jet smoke point giveaway

The energy giant is implementing Aspen GDOT at other refineries within the enterprise.

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About Aspen Technology

Aspen Technology (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 safer, greener, longer and faster.

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