MOTIVA

Motiva Sees Tangible Operational Gains, Strengthens Overall Profitability with Aspen GDOT™

aspentech | Case Study

"Aspen GDOT helped Motiva reduce Avjet and diesel giveaway. Building on this success, we are expanding GDOT to the naphtha envelope and FCC unit, leveraging AI-driven templates to unlock additional margin opportunities with minimal effort."

-Abhay Singh, Team Lead, APC/Optimization, Motiva Enterprises LLC

CHALLENGE

Motiva aimed to reduce product giveaway in jet fuel and diesel while enabling real-time monitoring of stream quality and active constraints across the middle distillate system.

Additionally, the refinery sought to optimize FCC olefins yield without compromising naphtha sulfur content, ensuring efficiency and compliance across complex operations.

SOLUTION

After successfully implementing Aspen GDOT to coordinate APC targets across crude, conversion and hydrotreating units—and reduce jet and diesel giveaway—the team used GDOT's Industrial AI-driven templates to accelerate model development and validation.

VALUE CREATED

- 1% increase in jet yield
- Jet flash giveaway cut by 3°F
- Sulfur giveaway reduced by 0.5 ppm
- FCC optimization accelerated using Industrial AI templates for faster model development and validation

Aligning APC Targets Across Crude, Conversion and Hydrotreating Operations

Motiva, one of North America's largest refineries, was looking to increase its middle distillate (MD) production while continuing to meet tight quality and regulatory specifications. The refiner was looking to minimize product giveaway in aviation jet fuel and diesel—particularly flash and sulfur specifications—without sacrificing throughput or margins. A major constraint was the limited real-time visibility into intermediate stream quality and active unit constraints across the MD system, which restricted responsiveness to changing crude slates and market conditions.

Traditional offline planning and periodic review cycles provided the refiner only modest flexibility to address daily variability in feed quality, unit performance and blending targets. Motiva needed a dynamic, integrated approach to coordinate decisions across crude, conversion and hydrotreating units, continuously align APC targets and deliver measurable improvements in yield, quality and blending efficiency.

Industrial AI Optimization for Greater Efficiency & Faster, Data-Driven Adjustments

Motiva applied Aspen GDOT's dynamic optimization to coordinate APC targets across crude, conversion, and hydrotreating units, reducing jet and diesel giveaway while improving blending efficiency. GDOT continuously aligned operating constraints and product property targets, enabling faster, data-driven adjustments as conditions changed—beyond what offline LP guidance could achieve. This delivered tighter control of Avjet flash and diesel sulfur and more efficient manipulation of product properties across the MD system.

Success in middle distillates gave the team confidence to expand GDOT use to FCC operations. Using GDOT's pre-trained Industrial AI templates, Motiva accelerated FCC model development and validation, capturing complex non-linear behaviors with built-in process expertise and first principles guardrails.

Results included:

- 1% increase in jet fuel yield
- Jet flash giveaway reduced by 3° F through coordinated APC targets
- Diesel sulfur giveaway reduced by 0.5 ppm in both low- and high-cetane pools
- Faster FCC optimization via AI-driven templates, enabling quicker deployment and higher model confidence

Together, these improvements have delivered tangible operational gains and strengthened overall refinery profitability for Motiva. Abhay Singh, Team Lead, APC/Optimization for Motiva says, "Building on GDOT's success reducing Avjet and diesel giveaway, we are expanding to the naphtha envelope and FCC unit, where AI-driven templates will enable us to unlock additional margin opportunities by efficiently modeling complex process behaviors with minimal effort."

Dynamic Optimization Delivers Results for Motiva

By leveraging Aspen GDOT's dynamic optimization and AI-driven capabilities, Motiva achieved measurable gains in yield, quality and efficiency while reducing giveaway. This approach not only delivered immediate business impact but also set the stage for broader adoption of AI-enabled optimization across complex refinery systems, ensuring long-term competitiveness and operational excellence.

Dynamic Optimization Powered by Industrial AI

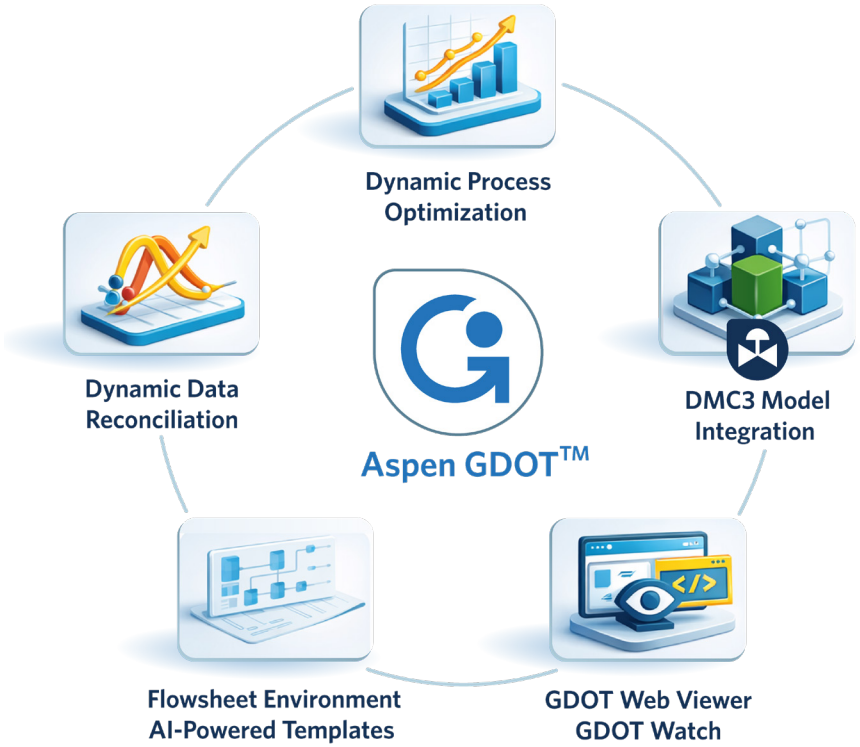
Easy-to-use pre-trained Industrial AI templates

- First principles guardrails
- Built-in process expertise that applies neural networks
- Accurate modeling of FCC process non-linearities across three product streams

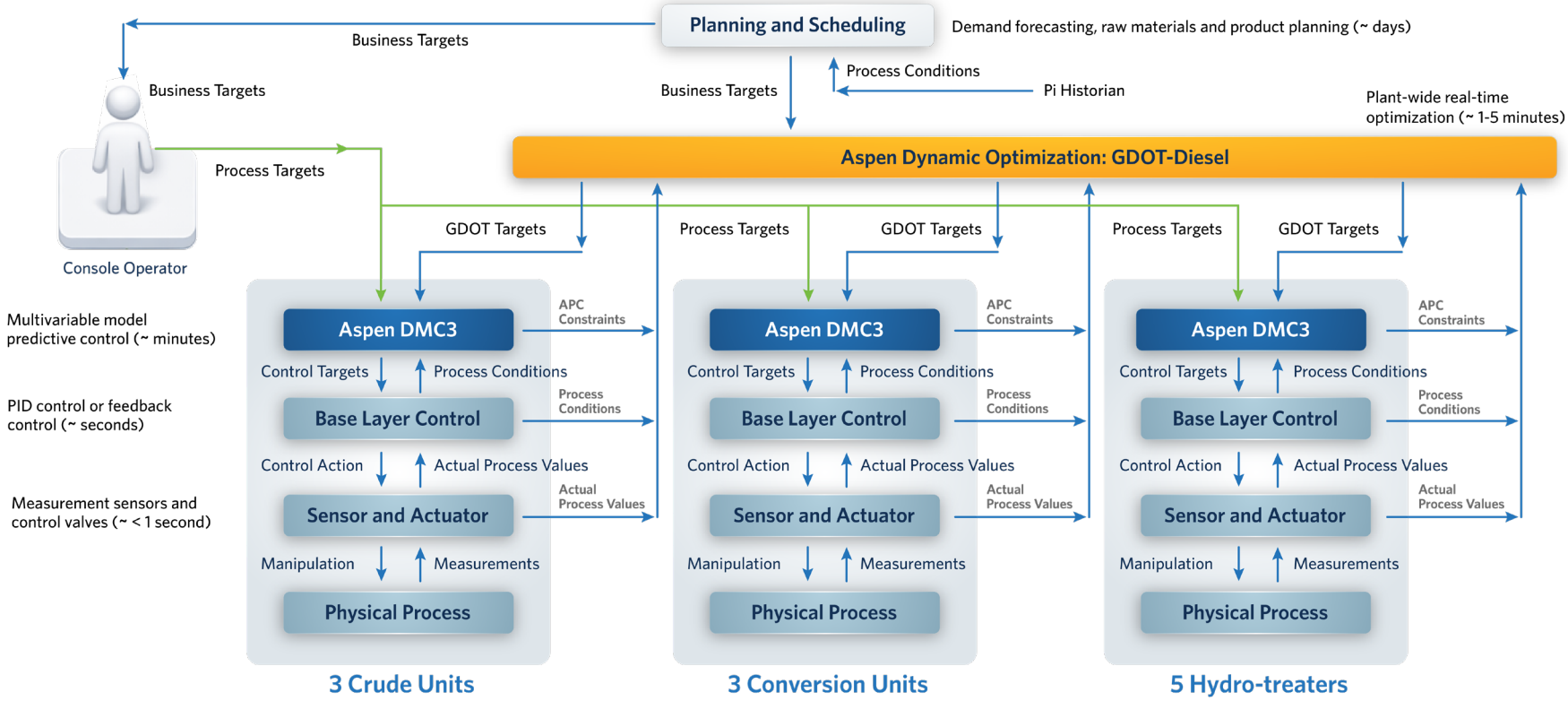
Enhanced user experience, model maintenance with Aspen GDOT Web Viewer

- Enhanced application visualization
- Improved model maintenance & explainability

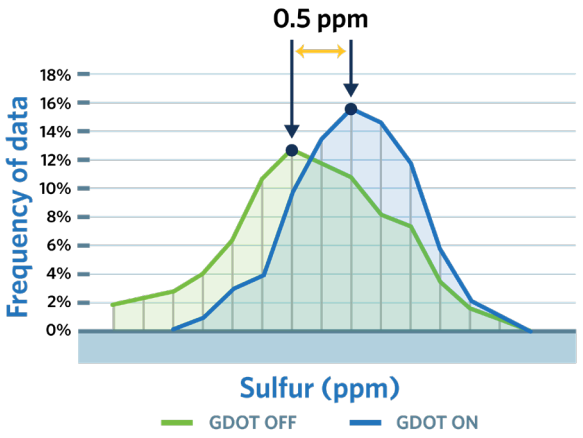
Key Enabling Features

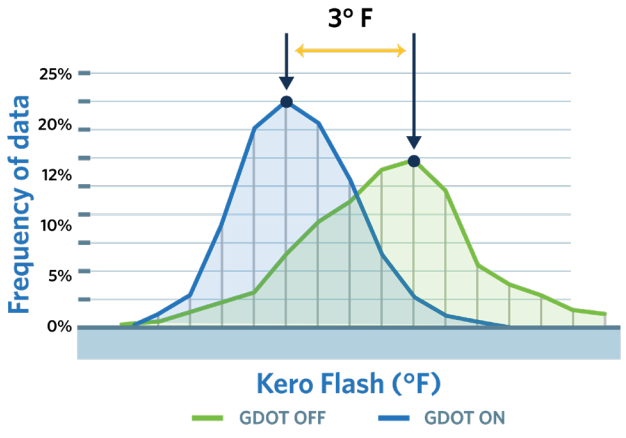


The GDOT Motiva Middle Distillate Pool Implementation

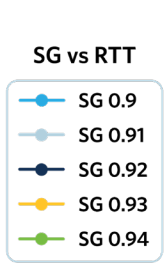


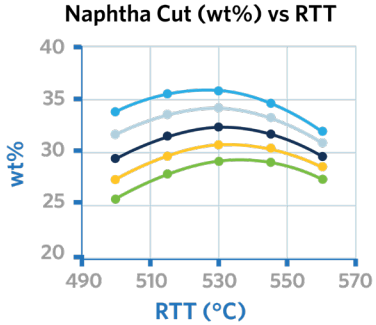
A Clear Shift in Product Quality Giveaway for Kerosene, Diesel Pools

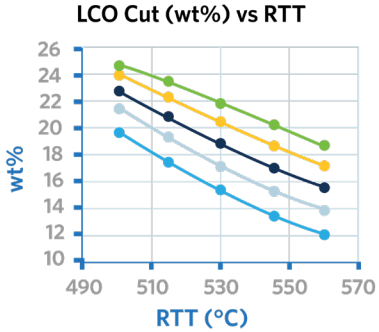


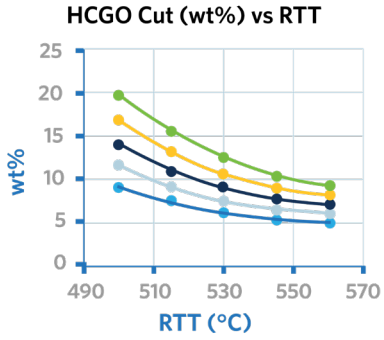


AI Templates: Accurate Modeling of FCC Process Non-Linearities Across Three Product Streams with Varying Specific Gravities









About Aspen Technology

Aspen Technology, now part of Emerson, is a global software leader helping industries at the forefront of the world's dual challenge meet the increasing demand for resources from a rapidly growing population in a profitable and sustainable manner. AspenTech solutions address complex environments where it is critical to optimize the asset design, operation and maintenance lifecycle Through our unique combination of deep domain expertise and innovation, customers in asset-intensive industries can run their assets safer, greener, longer and faster to improve their operational excellence.

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