

Aspen Unified Scheduling™

Increase Margins and Operational Agility Through Enhanced Collaboration and Alignment

Aspen Unified Scheduling (AUS) is used to manage short-term scheduling of petroleum refinery operations. It bridges the gap between production planning in **Aspen Unified PIMS™ (AUP)** and execution in **Aspen GDOT™** and **Aspen DMC3™**. AUS enables efficient, feasible and up-to-date scheduling of refinery production and supply chain, resulting in higher margins, increased alignment across the organization and more stable operations.

In addition to traditional scheduling simulations, AUS offers layered products for scheduling optimization: Crude Scheduling Optimization (CSO) and Multi-Blend Optimization (MBO).

Key Benefits of AUS

Increase Margins

Aspen Unified fundamentally changes the way planning and scheduling (P&S) interact through the site catalog, which shares a large amount of data between the P&S systems, such as operating modes, materials and properties. Sharing this data enables higher margins from better alignment with the optimal plan through robust integration of planning targets into scheduling in a true multi-user working environment. Improving legacy software capabilities, AUS enables end-to-end refinery scheduling where the crude unit and process unit schedulers work from a single model and can view the impacts their schedule is having on other parts of the refinery.

Additional Benefits With Optimization

AUS offers CSO to better align the crude area with the plan, which significantly increases margins. AUS also offers MBO for product blending to maximize yield, minimize quality giveaway and maximize margins from product sales.

Increase Throughput and Stability

Move from reactive to proactive by simulating future scheduled operations to enable the refinery to run closer to constraints. For example, the scheduler can predict and recommend crude blends that enable the crude distillation units to run more stably and thereby with a higher overall throughput.

Additional Benefits With Optimization

CSO automatically generates first-pass feasible schedules, honors constraints like inventory and flow rates, reduces process changes and stabilizes operations. MBO uses components in the most efficient way, ensuring longer blend campaigns and less quality giveaway.

Increase Productivity

In addition to the operational benefits, AUS also makes workers more efficient and productive by automating and streamlining routine tasks. Examples include automatic tank scheduling logic, scheduling-by-exception and automatically updating submodels between plan and schedule. Efficiently conduct “what-if” analyses, closely evaluate differences via a robust case comparison mode and selectively promote individual events or the entire scenario to the production case.

Additional Benefits With Optimization

Instead of manually evaluating multiple scenarios, schedulers can generate an optimized 30-day crude schedule within minutes. CSO and MBO significantly reduce cycle time and enable rapid what-if analysis.

Key Capabilities

- Powerful Gantt chart enables schedule view over time, with stock charts to visualize inventory projection.
- Simplified, modern user interface helps new users learn the tool faster. Flowsheet visualizes key data, like tank connections and inventories over time.
- Web-based application can be deployed in the cloud for fast, scalable processing supports faster simulation and optimization—and thereby better results.
- Multi-user enterprise environment improves security and tracks changes of business-critical, economic decision-making data.

Optimization Capabilities

- Crude Schedule Optimization (CSO) in AUS optimizes crude receipts allocation to marine and feed tanks, tank transfers and feed unit operations over a 30-day horizon while adhering to operational, logistical and product quality constraints.
- Assay management is powered by molecular characterization for better property prediction
- Custom Unit Calculations enable schedulers to conduct complex scheduling practices like reconciliation or automating crude run-down lineups in their schedule
- Multi-Blend Optimization (MBO) in AUS brings multi-blend capabilities into Aspen Unified with powerful integration features like aligning with the planning targets.

AUS USE CASE:

Challenges: Refiners and petrochemical producers face increasingly complex operations (i.e., increased crude feedstock variability or turnaround scenario planning). Additionally, the monthly or weekly optimal operating plan is difficult to execute on a daily or hourly basis to achieve optimal results. Data required to schedule exists in many different systems; it is laborious to collect and process data.

Solution: Aspen Unified Scheduling manages operations effectively by simulating the refinery in a way that is easy-to-understand and visualize. CSO brings never-before-seen capabilities to scheduling, creating feasible schedules in just a few minutes, a process that typically takes hours of manual work. MBO generates optimal blend recipes and schedules across gasoline, distillates, fuel oils and other refined products—while ensuring compliance with quality specifications, operational constraints and market requirements.

Result: Improved margins, increased throughput, more stable operations and better agility.

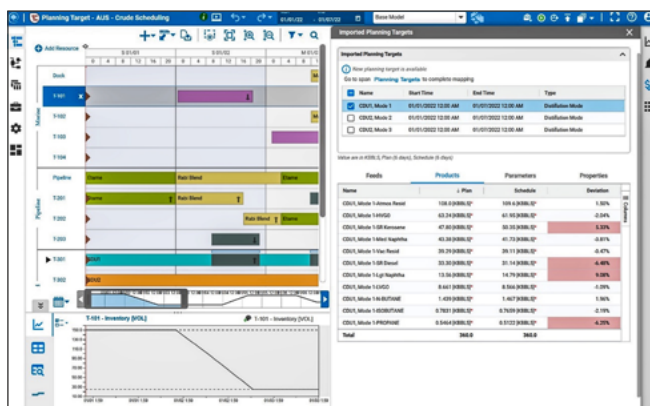


Figure 1. Passing targets from Aspen Unified PIMS (AUP) to AUS for one crude tower. Tracking deviation between plan and schedule enables higher margin by pushing actual operations closer to the optimal plan.

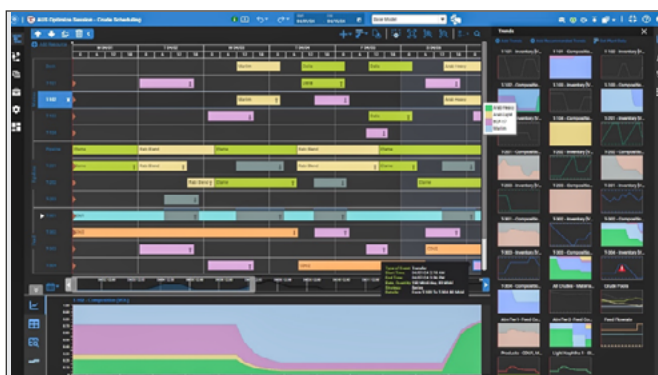


Figure 2. Crude area Gantt chart showing crude tank composition. As the blue crude is received, the composition is predicted, enabling more stable crude tower operations and higher crude throughput. Now with dark mode.