aspentech | Technology That Loves Complexity

Brochure

Aspen Unified™

Overview

Aspen Unified is the next-generation planning and scheduling solution from AspenTech, the creators of the world's leading planning and scheduling solutions —Aspen PIMS-AO™ and Aspen Petroleum Scheduler.™ Aspen Unified enables companies to increase margins and save time by coordinating siloed business processes for better efficiency across the petroleum value chain.

AspenTech's Production Optimization Solution brings many disparate processes together to reduce the gap created by inefficiencies in implementing optimal plans. Aspen Unified is the environment to leverage digitalization in your company, bringing technologies together to improve business results. AspenTech offers many industry-leading technologies, including advanced process control Aspen DMC3™, dynamic optimization technology Aspen GDOT™, predictive maintenance Aspen Mtell®, and plant digital twin (process simulation) in Aspen HYSYS™.

Challenge	Solution
Siloed Systems and People Can Result in Lost Opportunities Miscommunication between different groups in the plant, such as planners, schedulers and operators, can lead to errors resulting in margin leakage. Different models and data sources can provide different answers, or require significant manual rework to align.	**Solution:** *Aspen Unified simplifies these problems by combining models and data into one source.* • Production planning and scheduling can use the same master data (e.g., stream names or properties), submodels (e.g., reactor yields) and assay data. • Aspen Unified can synchronize real time with plant data historians and constraints in the APC/GDOT system to ensure that planning and scheduling take into account real conditions in the plant. • Easier collaboration on a web-based platform
User Experience Does Not Match Changing Demographics and Expectations The leading planning solutions from AspenTech, Aspen PIMS and Aspen PIMS-AO, are among the most established tools in the refining and petrochemical industries. With this tenure comes an aging interface.	**Solution:** *Aspen Unified combines an intuitive user interface, modern web-based architecture and data visualization tools for more efficient and powerful analysis.* • Faster to learn and train new users—expected savings of at least one staff-week per new user trained • Manage cases more intuitively—drag and drop, parent-child, copy/paste and automated case set creation • Better understanding of the results through flowsheet and quick data visualization in Unified tool • Online training "**eLearning**" with official certification programs and exams, including LinkedIn badges

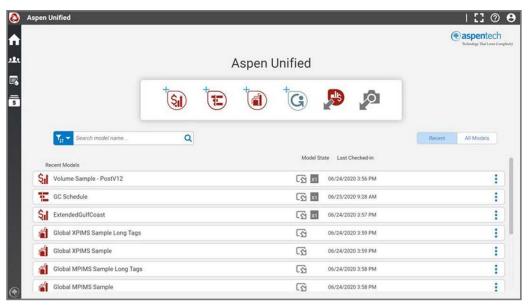| Challenge	Solution
Models are Difficult to Update and Maintain As plant operations change over time and conditions shift, models need to be updated to stay accurate. Since planning models are used to make critical business decisions, their accuracy is paramount.	**Solution:** *Aspen Unified makes model management and maintenance much easier.* • User- and role-based view/edit access, model versioning and restore points • Track changes made to models to prevent errors in complex tables • Simulate unit sub-models to check results
Technological Advances are Currently Untapped With high-performance computing, planning can be transformed into a big data exercise. Running hundreds or thousands of cases in a reasonable timeframe is now possible.	**Solution:** *Aspen Unified PIMS uses the latest hardware to deliver unmatched speed and allows you to keep working while the model solves.* • Cloud computing provides dramatically faster performance • Work while cases run, allowing for real-time interaction with the results and better data analysis

Creating the Optimal Plan
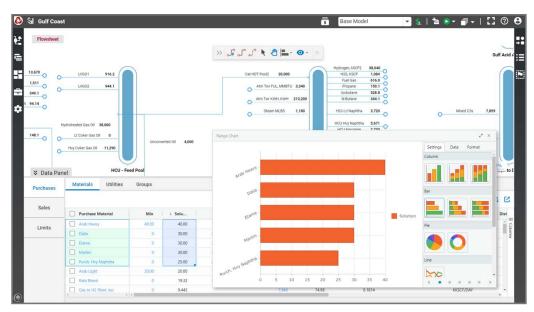
Technology: Aspen Unified™

Capabilities

- Simplified user interface helps new, younger users learn the tool faster than ever
- Multi-user enterprise environment improves security and change tracking of business-critical, economic decision-making data
- Common data and model library streamlines model updates and prevents costly errors
- Cloud-enabled solution
- Thin client enables faster deployment and upgrades

Benefits

- Solve up to 100 times faster with cloud-enabled parallel processing
- Save deployment time and money with easy adoption and model migration
- Analyze more scenarios and solve problems faster with blazing speed
- Save time training new users—get them up to speed twice as fast

Learn More

Aspen Unified Homepage

Aspen Unified PIMS Flowsheet and Quick Right-click Graphing
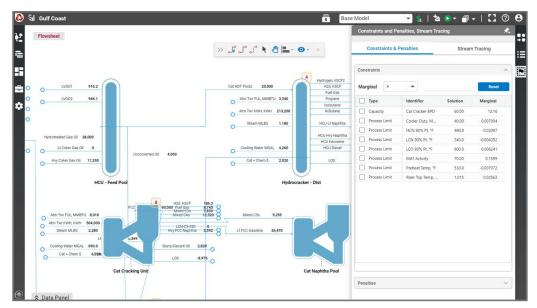
Production Planning

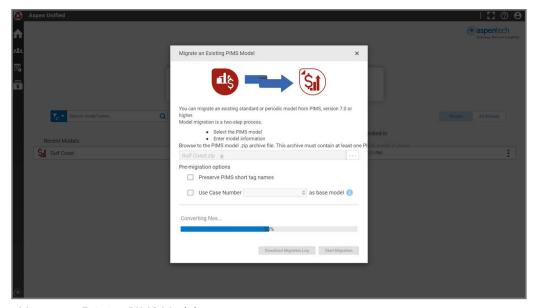## Technology: Aspen Unified PIMS™

Capabilities

- AspenTech's proprietary solver for complex refinery and chemical process problems is consistently proven more robust and reliable than any other commercially available solver (such as FICO XSLP)[1]
- Flowsheet interface to build, edit, visualize, and understand your planning model and results
- Automatic pricing and sensitivity analysis tools create cases for you, saving time every planning cycle
- Visualize results quickly by showing constraints and results with contextual "select, right-click and graph"
- Easy plug-and-play integration with business intelligence tools such as Microsoft Power BI
- Automatically import and convert your existing PIMS-AO model to Aspen Unified PIMS

Benefits

- Enable better business decisions with the proprietary AspenTech solver
- Increase margins significantly[2]
- Save time each day with improvements to the model management workflow

Learn More

Flowsheet with Constraints View

Migrate an Existing PIMS Model

Notes: [1] AspenTech regularly evaluates the best commercial and academic non-linear solvers to see how they compare to the AspenTech proprietary non-linear solver

[2] Contact AspenTech for a benefits estimate
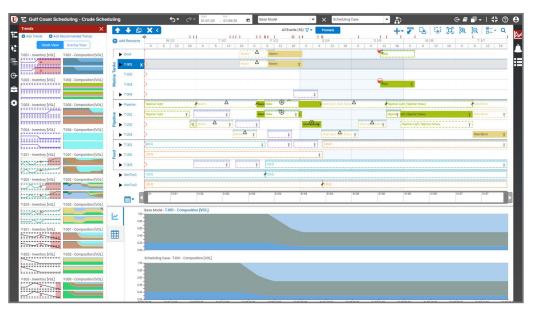
Production Scheduling

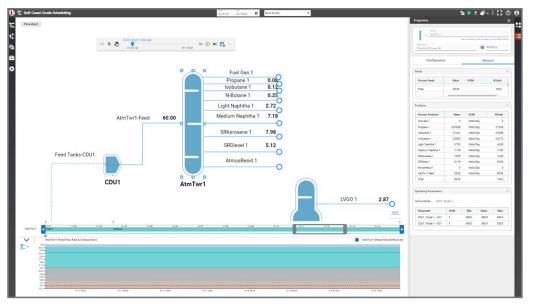## Technology: Aspen Unified Scheduling™

Capabilities

- Enable collaboration across teams with true multi-user scheduling solution

- Visualize the schedule in a new and improved Gantt chart and flowsheet

- Import the entire final plan directly from Aspen Unified PIMS

- Automatically create a new feasible crude schedule while respecting piping and inventory constraints

- Automatically reconcile yesterday's schedule with plant data

- Create logic to automate scheduling tasks

- Take advantage of full refinery scheduling (also known as process unit scheduling) now available in Unified

Benefits

- Save time with automated reconciliation and crude schedule optimization—up to 1000 man-hours per year per scheduler

- Increase margins up to 1%

- Create more stable refinery operations by reducing changes

- Implement quickly and easily, using your Unified PIMS model as a starter

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Aspen Unified Scheduling Gantt

Aspen Unified Scheduling Flowsheet

Value Chain Optimization
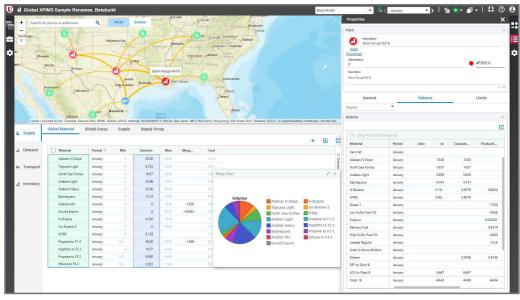
Technology: Aspen Unified Multisite for PIMS™

Capabilities

- Optimize supply, production, demand, sourcing and transportation across multiple refineries and terminals (depots) in a region
- Improve the gross margins of your entire company, not just an individual refinery—Value Chain Optimization
- Visualize planning results using maps, graphs and tables
- Evaluate business opportunities such as entering new geographic markets, creating new products, using new terminals and more

Benefits

- Increase margin by selecting optimal production locations and feedstock sourcing—gain 10 to 50 cents per barrel or up to $50M per year
- Reduce supply cost by optimizing freight and inventory usage
- Reduce cost of rush shipments and demurrage from better planning
- View the entire value chain to reduce disruptions from unplanned events, like hurricanes or typhoons

Learn More

Aspen Multisite Map and Graphing

Now Available: Chevron Assay Database

Technology: Aspen Assay Manager with Partner Equinox Software and Services Pvt. Ltd.

Capabilities

- Over 1000 unique crudes with over 2800 assays and over 60 physical and chemical properties
- All major globally traded crudes are represented by multiple assays
- Updated regularly
- Contact your Aspen Sales representative for more information

Benefits

- Increase planning model accuracy with more accurate assays
- Select better crudes for higher refining margin
- Analyze new crudes for spot opportunities
- Value crudes more accurately for trading

EQUINOX
...data to decisions...

Learn More

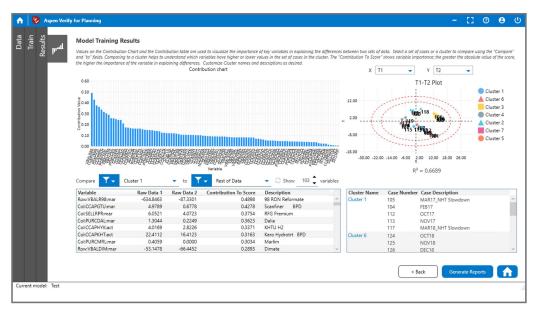# Verify Plan Results with Artificial Intelligence (AI)

Technology: Aspen Verify for Planning™

Capabilities

- Analyze historical plan results with AI algorithms to create clusters of data to better understand results and thus make better business decisions

- Rank variables by impact on the profitability of the plan to focus your time investigating what impacts the plan most

Benefits

- Help new planners and plan reviewers (such as operations and technical management) to understand the plan and see how it compares to history

- Identify discrepancies to prevent costly mistakes in the plan, saving approximately $1–3M per year

- Save time reviewing the plan—approximately 4 hours per week for a planner and 1 hour per month for each plan reviewer

Aspen Verify

Learn More

Expected Benefits of Aspen Unified

Increase margins significantly

- Align plan, schedule and execution
- Enable agile and robust decision making
- Prevent errors by sharing data seamlessly
- Enable more profitable integration between refining and chemicals units
- Allow companies without scheduling models to adopt scheduling easily by leveraging existing planning models. Quick adoption enables vast benefits such as higher margins, more stable operations and better response to unplanned events (e.g., shutdowns)

Save up to 1000 staff-hours per year so your teams can add more value to your business

- Save up to 200 staff-hours per year by reducing time and effort on model maintenance and management with new and improved workflows
- Save up to 1000 staff-hours per year per scheduler by automating data reconciliation and first-pass feasible schedule creation to save up to 5 hours per day
- Train new users much faster, saving at least 40 staff-hours per new user

Reduce total cost of ownership (hardware cost) up to 75%

- Deploy on a server or in a public or private cloud: typically 25-50% less expensive than powerful desktop computers
- Lower hardware costs with a device- and platform-agnostic solution
- Save IT cost on software upgrades using cloud or server installation

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. Visit AspenTech.com to find out more.

www.aspentech.com