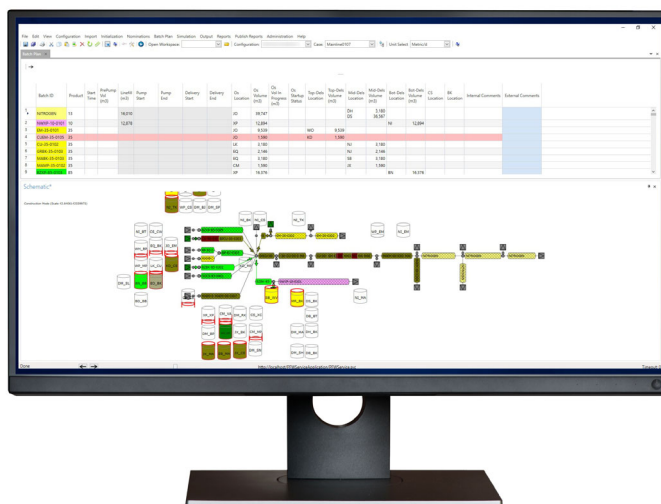


DeltaV™ SchedulingManager™ Software for Liquids Pipelines

A Software Suite for Identifying Constraints, Optimizing Assets, and Streamlining Logistics across Complex Pipeline Networks



DeltaV SchedulingManager Software for Liquids Pipelines is a turnkey solution for efficiently managing the transportation, storage, and delivery of liquid products.

Accurately Predict Operations

- Schedule and track inventory by product and/or by customer
- Manage nominations without a complex and cumbersome spreadsheet
- Predict bottlenecks and constraints across the entire pipeline network

Improve Visibility Enterprise Wide

- Maintain a central data repository to standardize information management
- Connect to key corporate IT systems to share data and insights across teams
- Web-based application with 2FA ensures secure access anytime, anywhere

Profit from Efficiency Gains

- Quickly review and incorporate any shipper changes to the schedule
- Forecast inventories and predict schedules and shipper positions by simulating tank inventories over 30, 60, or 90 days
- Improve customer satisfaction with more on-time deliveries

Plan Distribution across Your Network

- Evaluate alternate transportation options
- Maximize pipeline throughput
- Minimize operational cost while maximizing transportation margin

Manage Product Movements with Greater Control

Provide schedulers with the essential tools and information to ensure timely product delivery and optimize pipeline utilization. Emerson's scheduling management solutions for pipelines consist of DeltaV™ SchedulingManager™ Software for Liquids Pipelines and our Network Management Module for DeltaV SchedulingManager for Liquids Pipelines. DeltaV SchedulingManager Software for Liquids Pipelines is a robust, user-friendly, simulation-based liquids scheduling system with multiuser functionality, enabling multiple users to use the software at the same time without causing errors. This secure, web-based, agile solution can be deployed out-of-the-box or it can be tailored to meet specific needs. Training is provided by our project team and application engineers. After receiving training, users will have access to a single, flexible tool to simulate and model the hydraulic flow of crude oil, refined products, liquefied petroleum gas, and other liquids throughout the pipeline system. Our software also maintains a centralized data repository, offering insights into accounting, marketing, operations, and engineering activities. This repository enhances management's ability to make impactful daily commercial and operational decisions. By organizing and consolidating critical information, DeltaV SchedulingManager Software for Liquids Pipelines helps users maximize product movement through pipelines to ensure efficient and timely delivery.

Efficiently Manage Nominations

Managing complex nominations no longer requires complicated spreadsheets. Our intuitive web-based software streamlines the nominations process by showing pipeline companies the type of product being scheduled, the type of carrier, and where and when the product is scheduled for delivery. Any additional complexity due to change requests from customers and/or daily ordering is automatically managed by the software. DeltaV SchedulingManager Software for Liquids Pipelines generates and automates cycle plans and batch plans based on nominated values or terminal requirements, enabling users to quickly evaluate the stability of nominated volumes and accept new nominations and new customers with confidence.

Communicate Effectively with All Stakeholders

Pipeline customers may request changes daily depending on demand. When changes occur, pipeline companies need an effective way to quickly approve or reject these changes and communicate the decision with customers. DeltaV SchedulingManager Software for Liquids Pipelines is a web-based application with two-factor authentication, ensuring fast, easy, and secure access to the schedule at anytime. This simulation improves efficiencies and facilitates faster communication between pipeline companies and customers. Our software enables pipeline operators to share product location, destination, and arrival time with stakeholders, providing customers time to prepare their tanks.

Plan Logistics Across Your Transportation Network

Users can also simulate network connectivity, validate global nominations and contracts, and optimize multi-product pipelines with our Network Management Module for DeltaV SchedulingManager for Liquids Pipelines. Pipelines are often the most cost-effective way to transport product across the country, but they are not the only feasible method of transportation. This module enables users to manage routing through multiple pipelines or alternative modes of transport, such as rail, vessel, or truck. Pipeline companies can cost-effectively maximize nominations, coordinate and validate local schedules, and accurately estimate transport costs.

Efficiently Manage Diverse Products

Visualize & track batches throughout the pipeline with graphical outputs and dynamic schematics. DeltaV SchedulingManager Software for Liquids Pipelines tracks product blending in mixed batches and tanks through user-defined qualities, allowing for complex blending recipes and mixing strategies.

Evaluate Scheduling Changes Quickly

Evaluating and meeting transport schedules in a timely manner is crucial for pipeline companies. However, often only one or two schedulers know how to operate the scheduling spreadsheet. Challenges occur when there's an issue and these experts can't be reached. With DeltaV SchedulingManager Software for Liquids Pipelines, operators can rapidly access available inventory and capacity to make quick decisions without referencing these cumbersome spreadsheets or relying on tribal knowledge. Our simplified software solution automatically generates schedules from nominations and schedules product movements based on product, customer, or both. DeltaV SchedulingManager Software for Liquids Pipelines interfaces seamlessly with other systems, allowing users to efficiently send the schedule to the control room, terminal operators, and other stakeholders. Our software also supports multiuser functionality, enabling multiple users to make updates without causing errors.

Eliminate Manual Processes

Scheduling with a cumbersome spreadsheet or word processing document leads to inefficiencies. Every manual update is an opportunity for error. Many operations also print initial schedules then reprint them when changes occur, creating additional work and increasing office supply costs. Our turnkey software allows your staff to easily maintain up-to-date schedules that can be shared in just a few clicks. Rather than rely on spreadsheet macros, the structured workflow built into our software ensures all schedulers maintain a consistent process. This streamlined approach also eliminates inconsistencies that occur when multiple expert users implement the scheduling spreadsheet from shift to shift. DeltaV SchedulingManager Software for Liquids Pipelines automates the scheduling process, provides an intuitive user experience, and helps reduce training time for staff. Our software also minimizes the impact of losing scheduling knowledge when key team members leave or retire.

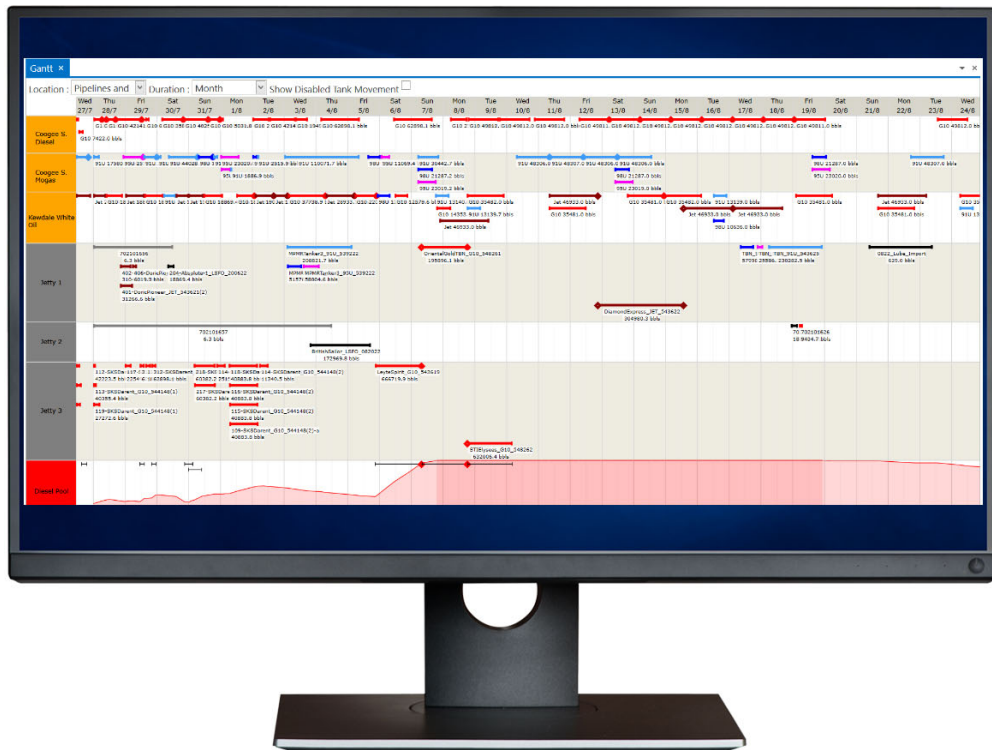


Figure 1: Seeing the entire pipeline network at a glance enables users to identify and remove bottlenecks quickly.

Simulate and Analyze Operations

Bottlenecks lead to delays, reduced throughput, and increased costs. Pipeline operators can predict bottlenecks and constraints across the pipeline network by running comprehensive and accurate model-based pipeline simulations. DeltaV SchedulingManager Software for Liquids Pipelines models actual pipeline operations based on time-based and event-based triggers. This allows users to rapidly identify and remove bottlenecks using a visual representation of the entire pipeline network over time. The software also creates efficient maintenance schedules, resource allocation plans, and minimizes system downtime by streamlining cycling plans. Operators using our software can dictate flow rates and injections, track product and customer inventory, and simulate different scenarios. This simulation data helps users visualize outcomes if proposed changes are implemented and how inventory will be updated.

Tank Management

Efficient tank management ensures that storage capacity is accurate, resulting in no overflows or shortages. DeltaV SchedulingManager Software for Liquids Pipelines facilitates communication with terminals regarding tank requirements. Pipelines can accurately predict blended qualities in tankage to meet demand and avoid potentially high or low violations. By simulating operations with our software, users can easily track terminal tankage, truck loading operations, and connected carriers to determine tank positions and violations. Pipeline operators must validate inventories to ensure supply commitments can be met and contractual violations avoided. Managing tanks with our software provides schedulers with the flexibility to react to variations in supply and demand to quickly verify additional nominations. Effective tank management also reduces the risk of environmental impacts, such as leaks, ruptures, or spills, keeping pipeline operations safe and compliant with regulatory bodies.

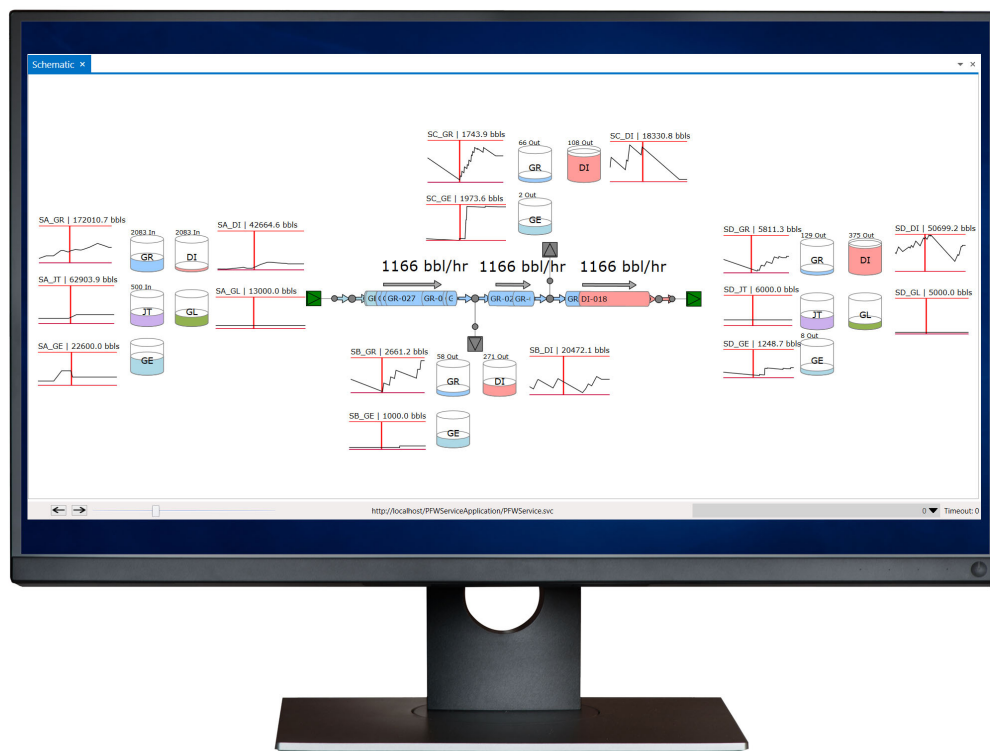


Figure 2: Schedule pipeline movements with ease using the schematic view.

Reconcile Scheduled and Actual with Ease

The reconciliation process of bringing in actual values and comparing them to planned movements can be tedious and error-prone if performed manually. Many schedulers are unable to act on up to date information quickly since they reconcile on a weekly or monthly basis instead of daily. DeltaV SchedulingManager Software for Liquids Pipelines puts scheduling data at the fingertips of the user, allowing them to instantly visualize scheduling activities, publish schedules to the ERP system, and reconcile scheduled versus actual day-to-day operations in minutes without spending hours sifting through stacks of printed schedules. Our scheduling software also integrates with existing ticketing and accounting systems to ensure your schedule is always up to date for the next day.

Optimize Network Distribution

A centralized scheduling system manager, dashboard, and visual schematic view are built into our Network Management Module for DeltaV SchedulingManager for Liquids Pipelines, providing non-technical users a clear view into transportation options. Optimization algorithms within the module automatically create plans that maximize pipeline throughput, minimize operational cost, and maximize transportation margin. The module automatically considers transport costs, capacity, maintenance schedules, transport time, storage options, and price and cost at supply and delivery points to determine the most cost-effective way to deliver product. Our Network Management Module for DeltaV SchedulingManager for Liquids Pipelines also automatically analyzes potential fungible trades with the lowest transportation cost and highest margin.



Figure 3: See constraints across the network with the schematic view.

Increase Reporting Efficiency

DeltaV SchedulingManager Software for Liquids Pipelines optimizes data storage and reporting with a relational database that provides financial reporting along with reports on crude mix or other liquids. Our software streamlines communication between the pipeline operator and stakeholders by sharing reports on batch and operational schedules, product arrival times, and inventory capacity. Detailed operational work orders can also be generated and distributed when required. Schedulers can preconfigure reports and automate end-of-day distribution via email. Reporting is customizable using consolidated data from multiple interfaces, including import and export nominations, line fill, tank levels, pumping schedules, and batch planning. Customized reports based on templates provided during training, setup, and implementation can also be created and configured by the Emerson application engineering team. Companies can manage KPIs more effectively and improve consistency across multiple operations using data extracted from DeltaV SchedulingManager Software for Liquids Pipelines.

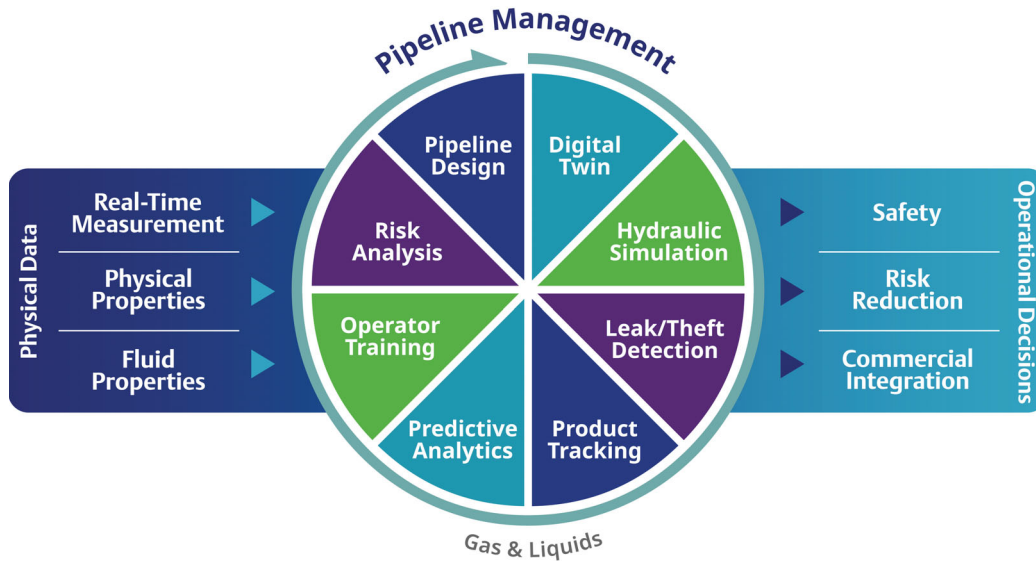
Streamlined Integrations

DeltaV SchedulingManager Software for Liquids Pipelines integrates with existing systems, such as:

- Microsoft® SQL Server® for nominations management
- SCADA or ticketing system to manage tickets
- ERP and accounting systems for efficient actualization
- Corporate IT systems
- Custom API integrations
- Other Emerson software applications

Agile Software Solutions for an Evolving Industry

Pipelines will continue to play a critical role in the future of energy transportation. Companies transporting hydrogen and CO₂ will likely use existing natural gas pipeline infrastructures. Carbon capture and sequestration programs will also rely on existing gas pipelines for transport. Emerson's software is built for the energy transition and will continue facilitating the transport of all products, including hydrogen, along the energy value chain as the transition to a low-carbon economy continues.



Streamline opportunities and overcome limitations by meeting commercial and operational objectives and regulatory requirements with our agile, field-proven software portfolio for gas and liquids pipelines.

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