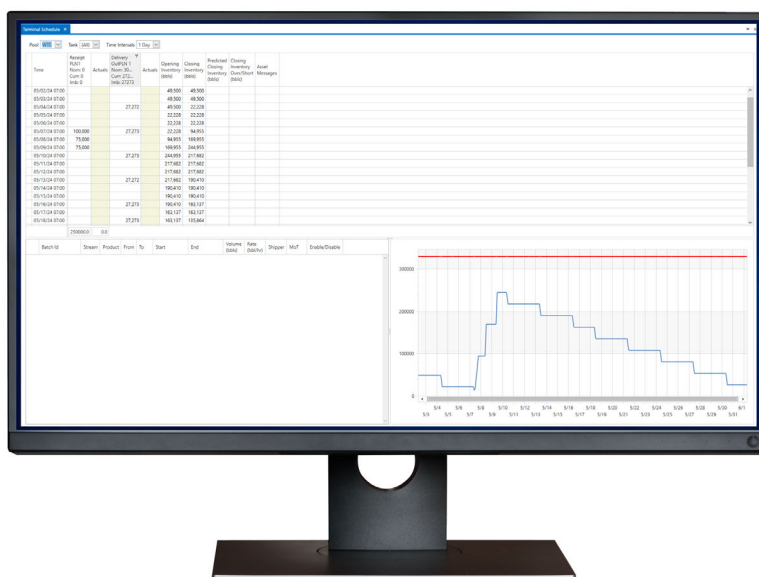


DeltaV™ SchedulingManager™ Software for Terminals

An Agile, Intuitive Scheduling Tool for Land-locked and Marine Terminals



DeltaV SchedulingManager Software for Terminals simplifies the management and scheduling of movements by product or by customer without pathing or routing.

Forecast with Confidence

- Streamline capacity management and inventory scheduling in, out, and within your terminal
- Plan weeks in advance, not days
- Reduce reliance on single point of terminal & operational knowledge to run terminals

Profit from Efficiency Gains

- Transition from manual to automated processes within three months
- Improve revenue by increasing throughput and terminal productivity by more efficiently using tank space by customer
- Rapidly upskill your staff with an intuitive user experience

Accurately Predict Operations

- Schedule and track inventory by product and/or by customer
- Generate and manage terminal movements using rules-based nominations processing features
- Schedule transportation with a full suite of capabilities for pipeline, truck, rail, internal tank transfers, and marine vessels

Ensure every customer movement is efficiently managed

Relying on spreadsheets and manual processes to schedule product could be putting your operations at risk. DeltaV™ SchedulingManager™ Software for Terminals allows your staff to efficiently address the logistical challenges of moving vast amounts of crude oil and refined products in, out, and within your terminal. You can now streamline your operations by scheduling inventory based on both customer and product. Our comprehensive software ensures your staff will have easy access to all the tools and data necessary to ensure your terminal is running at peak efficiency. Using advanced simulation tools, your staff will gain greater insights that enable maximum terminal tank usage, accurate prediction of blend quality in tanks, increased loading operation efficiencies, and streamlined logistics with third party carriers. With a few clicks, your users can assign when product is changing in a tank using start and end dates for each product change. Setting these dates prevents the user from assigning product to the wrong tanks for the duration of the scheduling simulation, increasing accuracy and minimizing errors. Our software also integrates with accounting systems and allows for custom reporting and easy end-of-day reconciliation, providing a highly efficient and turnkey solution.

Efficiently Manage Nominations

Automate nominations and generate cycle plans and tank movements based on nominated values or terminal requirements. DeltaV SchedulingManager Software for Terminals employs rules-based nomination processing to ensure nominations go smoothly. Schedulers can rapidly evaluate the stability of nominated volumes and seamlessly

make changes based on updated third party carrier schedules. Our software handles the import of nominations, processes those nominations, and generates schedules for those nominations as marine movements, pipeline movements, truck and rail movements, or tank to tank transfers. Nominations are imported directly from an ERP system, such as T4, or from Microsoft® Excel®.

Fast Deployment

Go from inception to deployment in three to six months. Start efficiently managing and scheduling every customer movement across pipeline, truck, rail, internal tank transfers, and marine vessels in a single software system.

Improve Forecast Accuracy

Schedulers can accurately forecast product or customer inventory over longer periods of time with our simplified scheduling software. The simulation tool enables a full view of incoming and outgoing movements over the next 30 to 60 days, providing greater insight than a spreadsheet that typically includes a limited 3 to 7 day forecast. Configurable rules are defined and implemented to prevent multiple deliveries sharing the same set of tanks. Our rules-based application allows terminals to set restrictions on shared headers and pipelines to limit multiple deliveries arriving at the same time. These rules can be updated and adjusted over time as your terminal changes, and manual overrides are an option when needed. Capitalize on better forecasting that results in better planning.

Nominations X								
	Nomination Date	Nomination	Product	Shipper	From	To	Nom Type	Volume (bbls)
1▶	05/01/24 09:00	PLN02-01	WTC	SHP10	PLN2	WTC	Receipt	250,000
2	05/01/24 09:00	PLN01-01	WTI	SHP14	PLN1	WTI	Receipt	275,000
3	05/01/24 09:00	PLN03-01	WTL	SHP3	PLN3	WTL	Receipt	175,000
4	05/01/24 09:00	PLN04-01	WTP	SHP8	PLN4	WTP	Receipt	225,000
5	05/01/24 09:00	OUTPLN1-01	WTP	SHP8	WTP	OutPLN 1	Delivery	225,000
6	05/01/24 09:00	OUTPLN1-02	WTC	SHP12	WTC	OutPLN 1	Delivery	300,000
7	05/01/24 09:00	OUTPLN2-01	WTI	SHP21	WTI	OutPLN 2	Delivery	300,000
8	05/01/24 09:00	OUTPLN2-02	WTL	SHP9	WTL	OutPLN 2	Delivery	300,000

Figure 1: Get a comprehensive view of all nominations in the system using the Nominations Table.

Maintain Consistent Terminal Scheduling

Schedulers across multiple shifts can be trained to follow the rules-based system, improving processes, consistency, and forecasting accuracy. Our streamlined scheduling software allows users to confirm in advance the amount of customer-leased capacity that remains. Movements can be accurately planned to accommodate remaining capacity, freeing up and increasing lease space. The result is a significant increase of throughput that is difficult to achieve using a spreadsheet that only provides a 3 to 7 day outlook. Our software's advanced simulation enables efficient and effective scheduling up 60 days in advance, minimizing human error while maximizing revenue potential.

Generate Schedules Easily

In many terminals, only one or two schedulers know how to operate the scheduling tool that often consists of a Microsoft Excel spreadsheet. Challenges arise when there's an issue and they can't be reached. Rather than rely on cumbersome spreadsheets and tribal knowledge, your staff can rapidly access available inventory and capacity by tank to select tanks with confidence. DeltaV SchedulingManager Software for Terminals automatically generates schedules from nominations and schedules all movements in, out, and

within a terminal, including incoming/outcoming pipeline, truck and rail, internal tank transfers, and marine vessel movements. No pathing or routing is required with this simplified solution. Schedules can be created based on product or customer, or both. The software empowers schedulers to quickly adapt and update schedules when third party carrier schedules change.

Get Instant Visibility to Capacity

When creating a schedule, terminal schedulers have instant visibility to how much capacity each customer has in the terminal without having to reference each contract separately. Schedulers can review customer and product inventory based on movements via Gantt chart or schematic view. In addition, schedulers can see movements and tank levels together all-in-one view with the Gantt chart's highly configurable labels. Scheduling details such as start time, volume, rates, customer, and the tank associated with the incoming movement can be edited in the Gantt chart as well. Charts and graphs also provide a quick and detailed view of the schedule. This view dynamically changes as users scroll through different dates, allowing schedulers to see how tank volumes change over time.

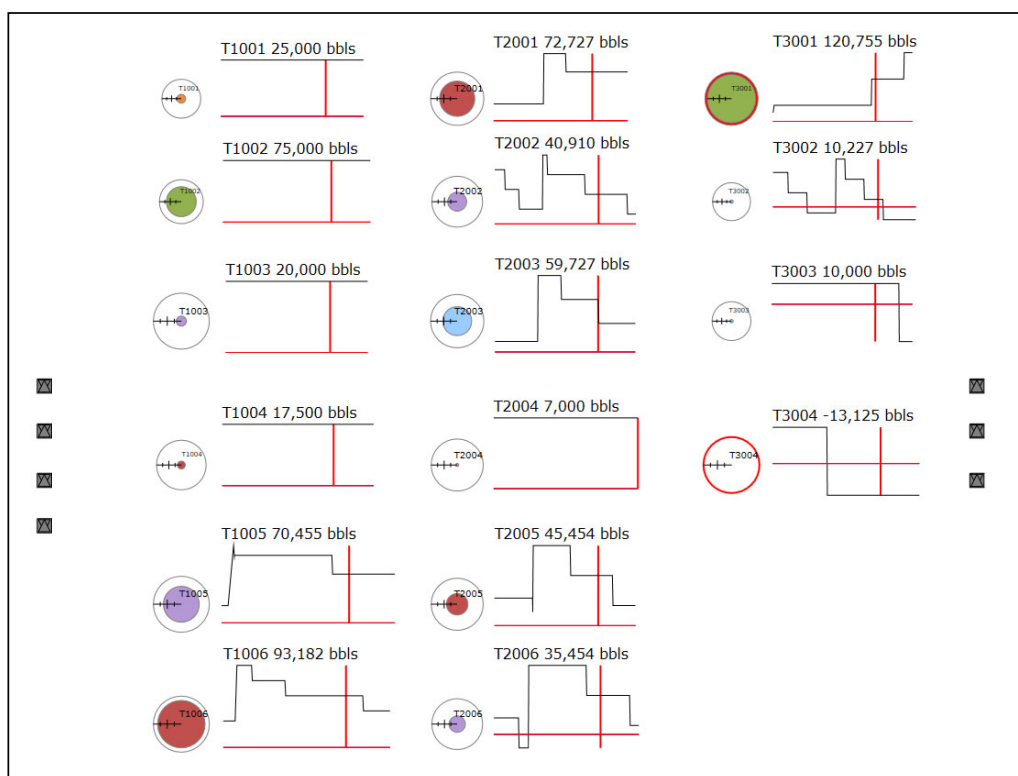


Figure 2: View inventory and volume at specific times with the interactive Schematic View.

DeltaV SchedulingManager Software for Terminals also provides a schematic view. Each view available in the software shows accurate data in a simple and intuitive interface, allowing schedulers to make informed decisions quickly. With a larger data set, your schedulers can make more accurate and timely decisions, resulting in better business processes for the terminal.

Eliminate Manual Processes and Printing

Scheduling with a cumbersome spreadsheet or word processing document leads to headaches, debugging, and constant manual updates. Every update is an opportunity for error. In addition, it is common practice to frequently print schedules, including reprinting when scheduling changes occur. Our software allows your staff to easily maintain up-to-date schedules and digitally share these documents in just a few clicks. Rather than rely on spreadsheet macros, the structured workflow built into the tool ensures all schedulers maintain a consistent process. This streamlined approach also eliminates inconsistencies that occur when multiple master users implement the scheduling spreadsheet from shift to shift. DeltaV SchedulingManager Software for Terminals provides an intuitive user experience while automating the process, helping reduce time spent training staff while minimizing the impact when tribal knowledge of your scheduling process is lost.

Share the Schedule with All Stakeholders

Schedules are published and shared once the inventories are accurate and forecasted. DeltaV SchedulingManager Software for Terminals makes it easy to publish and share a schedule to multiple stakeholders, including the operations team and/or your customers, providing all parties with visibility to up-to-date information. Schedulers can send the schedule as soon as it is finalized via email directly from the software to individual emails or an email distribution list. The software can also export a schedule to multiple file formats, such as Microsoft Excel, Adobe® PDF, .txt, and other options.

Hassle-Free Ticket Handling

Tickets can be imported from an existing ticketing system in your terminal to a ticket view or landing page screen. This automated process ensures schedulers can view, correct, and modify tickets in the software before applying them to the schedule. Once tickets are corrected and verified by the scheduler, the tickets are actualized and added to the schedule.

Reconcile Scheduled versus Actual with Ease

Rather than refer to data that's buried in a stack of binders, put scheduling data at your fingertips. With easy access to data saved digitally in a central repository, schedulers can instantly visualize terminal activities, publish schedules to their ERP system, and reconcile scheduled versus actual day-to-day operations in minutes instead of hours. The software also integrates with existing accounting systems to handle updated actualizations.

Tickets															
	Ticket Number	Ticket ID	Batch ID	From	To	Product	Shipper	Start Date	End Date	Planned Volume (bbls)	Actual Volume (bbls)	Rate (bbl/hr)	Timestamp	MoT	Ticket Type
1	1	OUTPLN1-WTP	WTP-005-67	WTP	OutPLN 1	WTP	SHP8	05/01/24 09:00	05/02/24 11:33	28,125	25,000	941		Pipeline	Completed
2	2	OUTPLN1-WTP	WTP-005-67	WTP	OutPLN 1	WTP	SHP1	05/02/24 09:00	05/03/24 11:33	28,125	25,000	941		Pipeline	Partial
3	3	OUTPLN1-WTP	WTP-005-67	WTP	OutPLN 1	WTP	SHP10	05/03/24 09:00	05/04/24 11:33	28,125	25,000	941		Pipeline	Partial
4	4	OUTPLN1-WTP	WTP-005-67	WTP	OutPLN 1	WTP	SHP12	05/04/24 09:00	05/05/24 11:33	28,125	25,000	941		Pipeline	Partial
5	5	OUTPLN1-WTP	WTP-005-67	WTP	OutPLN 1	WTP	SHP14	05/05/24 09:00	05/06/24 11:33	28,125	25,000	941		Pipeline	Partial
6	6	OUTPLN1-WTP	WTP-005-67	WTP	OutPLN 1	WTP	SHP14	05/06/24 09:00	05/07/24 11:33	28,125	25,000	941		Pipeline	Partial
7	7	OUTPLN1-WTP	WTP-005-67	WTP	OutPLN 1	WTP	SHP13	05/07/24 09:00	05/08/24 11:33	28,125	25,000	941		Pipeline	Partial
8	8	OUTPLN1-WTP	WTP-005-67	WTP	OutPLN 1	WTP	SHP17	05/08/24 09:00	05/09/24 11:33	28,125	25,000	941		Pipeline	Partial
9	9	OUTPLN1-WTP	WTP-005-67	WTP	OutPLN 1	WTP	SHP16	05/09/24 09:00	05/10/24 11:33	28,125	25,000	941		Pipeline	Partial
10	10	OUTPLN1-WTP	WTP-005-67	WTP	OutPLN 1	WTP	SHP20	05/10/24 09:00	05/11/24 11:33	28,125	25,000	941		Pipeline	Partial
11	11	OUTPLN1-WTP	WTP-005-67	WTP	OutPLN 1	WTP	SHP7	05/11/24 09:00	05/12/24 11:33	28,125	25,000	941		Pipeline	Partial

Figure 3: Automate ticket imports to easily actualize the system on a daily basis.

Increase Reporting Efficiency

Detailed operational work orders can be generated and distributed when required. Our software allows schedulers to preconfigure reports and automate end-of-day distribution via email. Reporting can also be customized. In addition, information can be extracted to manage operational KPIs, improving consistency across multiple operations.

Automate Tank Selection (with Manual Override)

Schedulers may not know which tank is available. In this case, the movement is sent to a tank pool with the operations team assuming the responsibility for selecting the tank. DeltaV SchedulingManager Software for Terminals streamlines this process by enabling automatic round-robin tank selection. Round-robin selection chooses delivery tanks based on tank ullage within a tank pool. Once a pool is selected, tanks are filled one at a time. Withdrawal from a tank is also one at a time to ensure there are no conflicts or

issues. In addition, only one tank receives product at a time while another delivers. Since the software allows schedulers to forecast inventory by product as well as by customer, schedulers can configure customer-specific tank pools with contract restrictions applied to those tanks. Tank service can quickly be changed throughout the month and rest time can also be configured using the software. Automatic tank selection provides consistency in the terminal but can be overridden by the scheduler. The tanks are still restricted based on the product that has been assigned to specific tanks or based on customer contract specifications, even when the scheduler is selecting tanks manually.

Limit Degradation of Product Quality

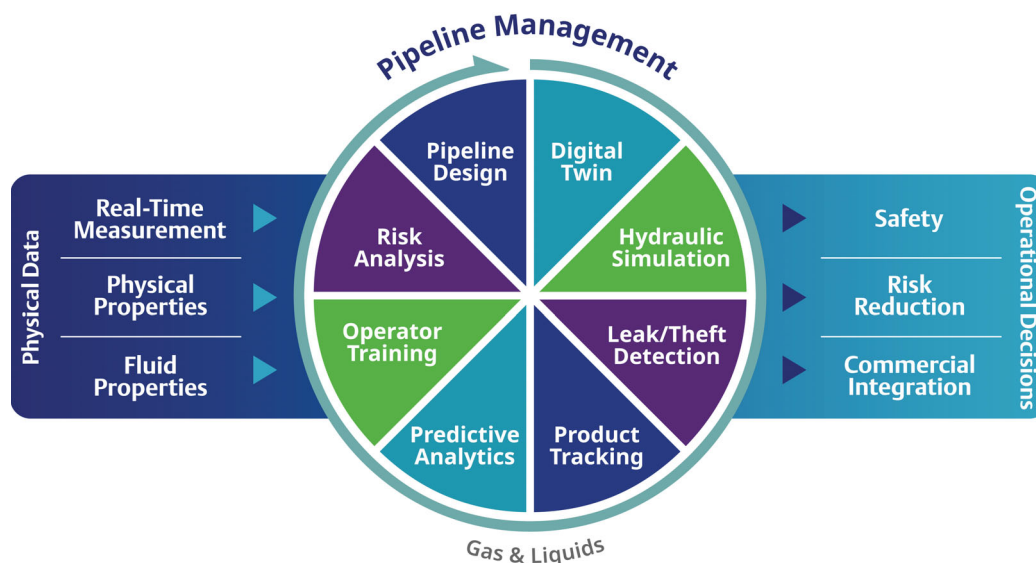
Avoid potential high or low violation and minimize product transmix in your tanks by tracking product quality effectively.

Tank Details							
	Tank Name	Tank Abbreviation	Low Low (bbls)	Low (bbls)	High (bbls)	High High (bbls)	Location
1	T1001	T1001	0	1,000	100,000	110,000	MarineTerminal
2	T1002	T1002	0	1,000	100,000	110,000	MarineTerminal
3	T1003	T1003	0	1,000	100,000	110,000	MarineTerminal
4	T1004	T1004	0	1,000	100,000	110,000	MarineTerminal
5	T1005	T1005	0	1,000	100,000	110,000	MarineTerminal
6	T1006	T1006	0	1,000	100,000	110,000	MarineTerminal
7	T1007	T1007	0	1,000	100,000	110,000	MarineTerminal
8	T1008	T1008	0	1,000	100,000	110,000	MarineTerminal
9	T2001	T2001	0	1,000	100,000	110,000	MarineTerminal
10	T2002	T2002	0	1,000	100,000	110,000	MarineTerminal
11	T2003	T2003	0	1,000	100,000	110,000	MarineTerminal
12	T2004	T2004	0	1,000	100,000	110,000	MarineTerminal
13	T2005	T2005	0	1,000	100,000	110,000	MarineTerminal
14	T2006	T2006	0	1,000	100,000	110,000	MarineTerminal
15	T2007	T2007	0	1,000	100,000	110,000	MarineTerminal
16	T2008	T2008	0	1,000	100,000	110,000	MarineTerminal
17	T3001	T3001	0	1,000	100,000	110,000	MarineTerminal
18	T3002	T3002	0	1,000	100,000	110,000	MarineTerminal
Pool Service							
	In Service	Pool	From Date	To Date	From Level (bbls)	To Level (bbls)	Comments
▶	In Service	ZSED	06/01/24				

Figure 4: Automate tank selection in a tank pool using the software's Round Robin or First Come First Serve rule.

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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