

Case study

# Uncovering hidden capacity in pipeline logistics

How one oil & gas logistics provider optimized scheduling  
to uncover hidden capacity and increase revenue





## The customer

Quintiq counts among its customers some of the world's largest oil & gas companies. These companies rely on the Quintiq solution for the daily planning, scheduling and optimization of their biggest operational challenges — be it oil or LNG shipping, distribution of crude oil and refined products, LNG production or secondary distribution.

This Quintiq customer is a leading provider of logistics services for the oil & gas industry. One of the services it offers is a pipeline system that moves refined oil products such as diesel and gasoline through an extensive network that covers over 1,000 miles across multiple states.

This pipeline network has many injection points from several different producers. While there are smaller feed points that merge into larger lines segregated by diesel and gasoline products, there are also parts of the network that comprise one large line, which must carry all products. The line then splits out to provide multiple delivery points.

The logistics provider has a solid reputation for reliable performance and receives more requests for batch shipping than its pipeline can handle. With demand outweighing capacity, it has to make daily choices about which nominations to accept.



## The challenge

The logistics provider's planners are responsible for:

1. Determining which nominations to accept or reject
2. Sequencing nominations to reduce interfaces between the batches of different products, also known as transmixes
3. Producing schedules that will maximize pipeline capacity

The complexity of dealing with different products and customers was compounded by the shortcomings in the logistics provider's own scheduling process and technology. Planners had to contend with three independent systems — one for nomination entry, one for scheduling and one for the back-end accounting. Any data that had to be shared between systems required manual input.

The existing pipeline scheduling application had issues of its own. Because dependencies had been incorrectly modelled into the solution, it did not take into account the fact that when two batches arrive simultaneously at the main pipeline, only one can be pumped at a time; the other one has to wait. Schedules depended heavily on a planner's attention and soft knowledge.

There were problems with communication too. The system did not automatically update producers. Any notifications had to be made via email, creating additional work for already overtasked planners.

The solution also lacked agility to grow with the network. Newly acquired pipelines had to be scheduled independently from the rest of the network.

To create even suboptimal schedules, planners had to study Gantt charts to figure out where batches overlapped. This took a lot of time and effort. Furthermore, this disjointed scheduling system carried the risk of creating infeasible solutions that resulted in shutdowns.





## The search

To increase capacity use and profits, the logistics provider understood that it needed a solution that would provide:

- Integration between the nomination entry and planning system, and enhanced integration to the back-end accounting system
- Decision support for business-smart nomination acceptance
- Sequencing optimization to ensure that the pipeline would be fully utilized and all nominations delivered on time while simultaneously minimizing transmixes
- Insight into how each decision impacts the overall schedule and the effect on the logistics provider's KPIs
- Automated updates to stakeholders, including internal departments and producers







## The selection

Quintiq's track record in oil & gas makes it the choice of many leading companies in the industry. Its solutions have successfully solved a diverse range of complex planning puzzles — including multi-modal primary logistics, oil and LNG shipping, production, and more.

However, it was for more than general industry experience that Quintiq was selected to solve this particular pipeline scheduling puzzle.

The logistics provider had experienced firsthand the power and benefits of Quintiq's configurable planning and optimization technology in two prior successful projects. It was already using Quintiq to schedule its crude oil pipeline and crude oil trucking logistics.

For its third and most recent scheduling project for the refined products pipeline, the logistics provider chose Quintiq based on demonstrated optimization expertise and ability to provide an intuitive, fully integrated scheduling system.

## The solution

The highly flexible and configurable Quintiq platform enabled the Quintiq team to model a 100%-fit solution for the logistics provider. This centrally managed solution:

- Is modelled to take into account all the logistics provider's rules and constraints, thus eliminating scheduling errors based on human oversight
- Provides an accurate representation of dependencies across the entire network, highlighting any scheduling overlaps
- Supports planners with next best alternatives when scheduling conflicts are identified
- Enables planners to manage and pro-rate nominations when the system is over capacity
- Optimizes batches based on daily changes, always proposing the schedule that most closely achieves the logistics provider's KPIs
- Is fully scalable and configurable to support future changes to the pipeline network as well as IT infrastructure. This capability will enable its plans to embark on a large systems integration project, which will be facilitated by an integration layer provided by Quintiq
- Integrates systems fully — Quintiq handles acceptance and scheduling of nominations, then sends the finalized plan to the accounting system so billing is done when the product is delivered







## The results

The project went live in August 2017 and from the very first report, it was clear that Quintiq was a perfect fit in more ways than one. The new planning and optimization solution had reduced monthly backhaul time by 12 hours. Fewer backhaul hours gave the logistics provider more capacity to accept more nominations and thus generate more revenue. It had taken vision and determination to switch to a new planning system, and now, it was being rewarded with immediate ROI.



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