

# Leading Gas-to-Liquids Producer Reduces Costs and Engineering Hours Using Aspen HYSYS®

# Key Goals for the **BLOWDOWN™** Technology

- Ensure safe operations of distillation columns in multiple scenarios
- Prevent existing flare system from being overloaded
- Extract 13 tons of process materials in just 15 minutes

## CHALLENGES

Implement a pressure protection system to ensure safe operations at ORYX GTL's plant without incurring significant CAPEX and revenue loss from operation downtime

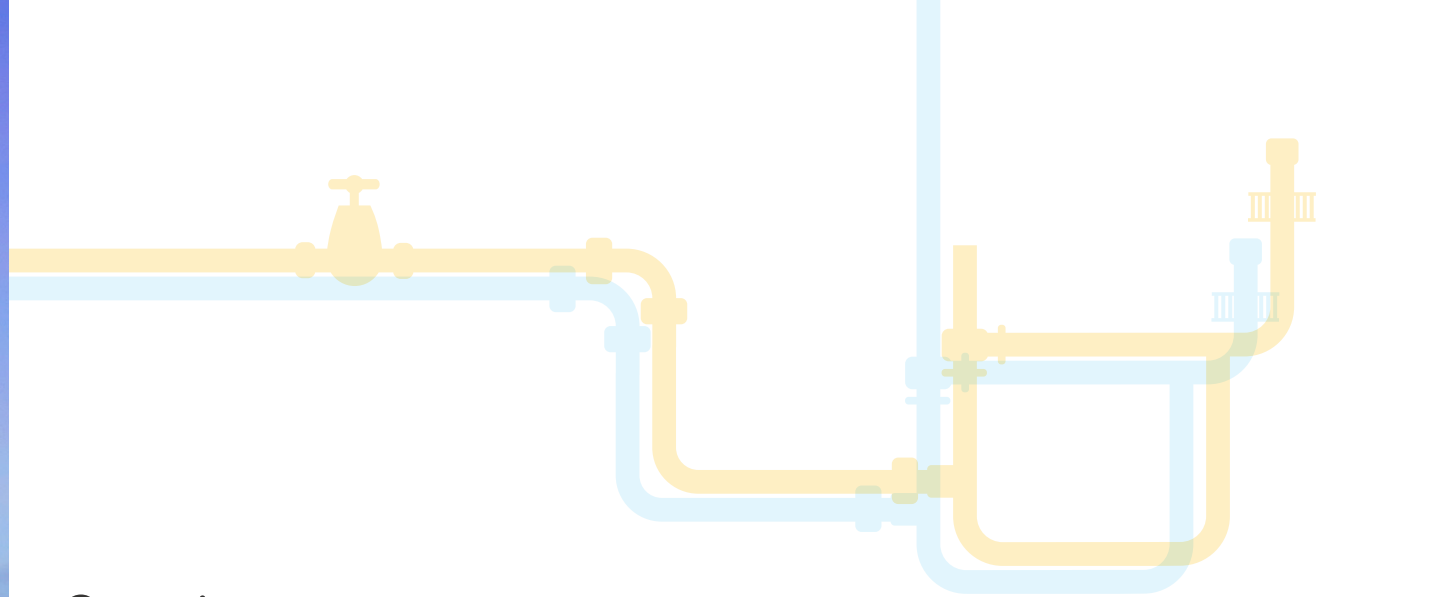
Ensure existing flare system wouldn't be overloaded

## SOLUTION

- Aspen HYSYS BLOWDOWN
- Aspen Flare System Analyzer™
- Aspen HYSYS Dynamics™

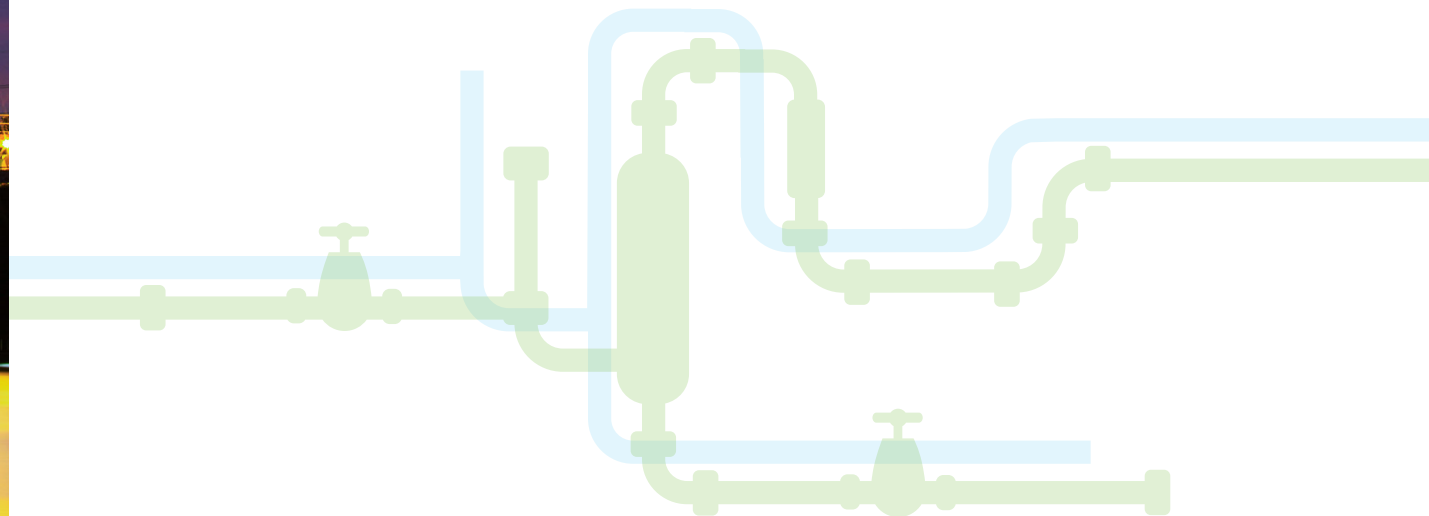
## VALUE CREATED

- Increased safety at the plant significantly
- Saved over \$130M USD in avoided production downtime costs
- Avoided the need to implement the High Integrity Pressure Protection System (HIPPS), resulting in savings of almost \$7M USD
- Shortened project completion time by nearly 73%



## Overview

ORYX GTL Limited is a gas-to-liquids (GTL) diesel and naphtha producer located in Doha, Qatar. The company's synthetic fuel plant in Ras Laffan Industrial City, Qatar, uses GTL technology to convert natural gas into propane, diesel, jet fuel etc. The company's mission embodies sustainability and versatility. The diesel fuel produced by ORYX GTL has a superior environmental profile over conventional diesel, compatible with the existing fuel distributing infrastructure. The fuel can be used with current and future diesel engines and is high quality feedstock to produce ethylene for the polymers industry.





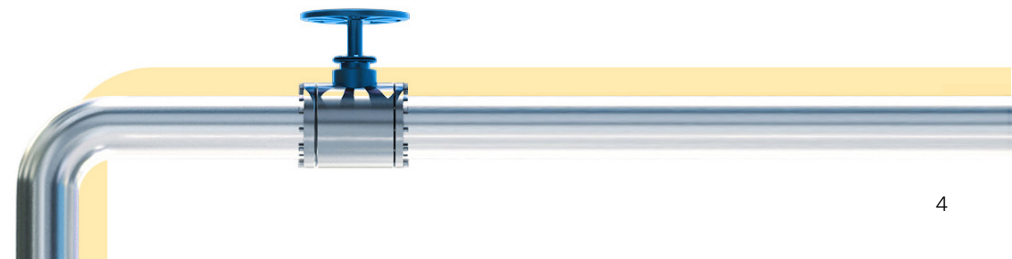
## Recognizing Risk, Exploring Solutions

Converting gas to liquids is a complex process that demands rigorous adherence to safety standards and system efficiencies. ORYX GTL understood the critical importance of having safety measures in place to avoid or minimize safety incidents or potential risk to personnel.

The initial design of its propane unit failed to incorporate a blowdown system that would discharge hydrocarbon liquid under different potential fire scenarios. Recognizing this as a potential safety risk for both personnel and infrastructure, ORYX GTL's management made a strategic decision to retrofit the unit with a blowdown system. This endeavor, however, was fraught with design challenges. Conventional methodologies and tools were proving inadequate to create a design that could ensure maximum safety, optimize operations and avoid unnecessary CAPEX from overdesign.

The company had initially considered installing three HIPPS, but ruled out this approach due to the significant cost and operation downtime it would require. ORYX GTL began searching for other alternatives, eventually selecting the AspenTech solution to help them achieve these key goals:

- Identify the minimum design metal temperature (MDMT) to ensure that there was no cracking of equipment
- Inspect the top of the propane distillation columns to see if there were any temperatures issues
- Determine the best location for the blowdown system, a critically important decision





## Significant Project and Capital Cost Savings Achieved with AspenTech Solutions

BLOWDOWN Technology within Aspen HYSYS was leveraged to accurately identify the MDMT. Using Aspen HYSYS Dynamics, simulations of different operational scenarios—including potential emergency scenarios—were performed. These helped the team to visualize and understand how the system would respond over time and under various conditions.

By capturing the transient behaviors of the process, the team could predict and mitigate issues that static simulations would miss.

While Aspen HYSYS Dynamics enabled accurate estimation of blowdown relief load, the integration between Aspen HYSYS and Aspen Flare System Analyzer facilitated a streamlined workflow for further flare system design and rating work, eliminating the need for manual data transfer. Ensuring that the flare system would not be overloaded was essential, not just for safety, but also to meet regulatory compliance. Plant engineers could better analyze how the system would behave, deciding that a multi-blowdown system was necessary and eliminating the need to cut the system into three independent parts.

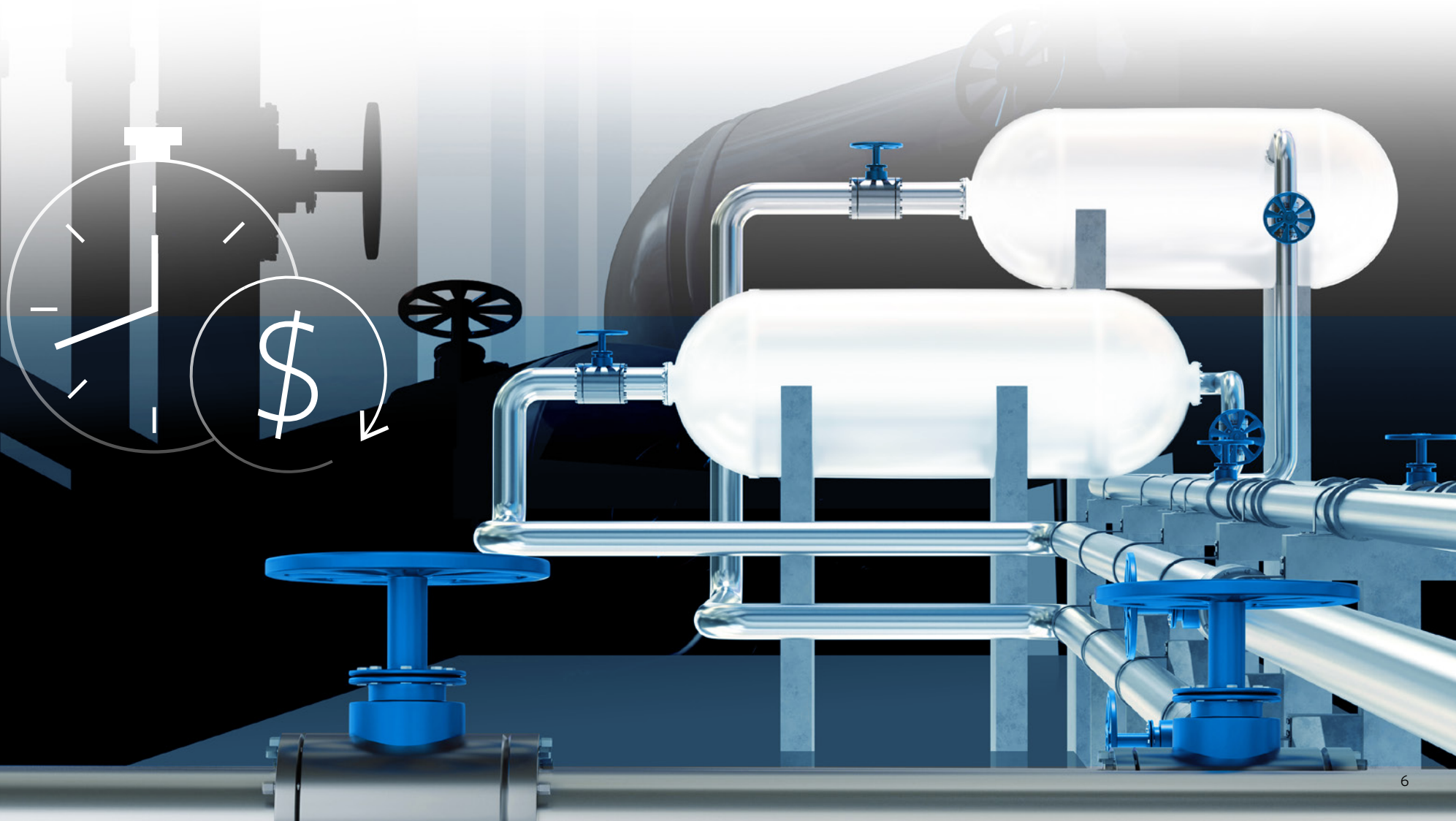
During the pivotal engineering phase, the application of AspenTech's solutions led to project completion time savings of approximately 73%.



# Conclusion

ORYX GTL's success is a testament to the significant role that advanced simulations and digital technologies can play, to ensure technical efficiency and safety while also driving economic value. By employing the AspenTech solutions, the company was able to avoid significant CAPEX expenses, highlighting the financial merits of embracing technological advancements in complex industrial settings.

This case also underscores the transformative potential of integrating advanced software solutions like Aspen HYSYS Dynamics and Aspen Flare Analyzer. In addition to improving safety, these solutions provided actionable insights that led to significant cost savings.





## About Aspen Technology

Aspen Technology, Inc. (NASDAQ: AZPN) is a global software leader helping industries at the forefront of the world's dual challenge meet the increasing demand for resources from a rapidly growing population in a profitable and sustainable manner. AspenTech solutions address complex environments where it is critical to optimize the asset design, operation and maintenance lifecycle. Through our unique combination of deep domain expertise and innovation, customers in capital-intensive industries can run their assets safer, greener, longer and faster to improve their operational excellence.

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