

# Top Diesel and Naphtha Producer Uses Product and Process Quality Analytics to Reduce Flaring, Emissions



“AspenTech’s industry-leading expertise in implementing machine learning solutions for asset and process optimization has made it possible to shift from reactive to prescriptive actions when tackling operational challenges.”

– Dameon Miller, Head of Automation,  
ORYX GTL

Flaring  
**28% Reduction\***

CO<sub>2</sub> Emissions  
**2% Reduction\***

Off-Spec Product  
**6% Reduction**

## CHALLENGE

ORYX GTL was looking to minimize flaring from its CO<sub>2</sub> stripper and increase yield in its naphtha/diesel fractionator.

## SOLUTION

Aspen ProMV<sup>®</sup> product and process quality analytics solution

## VALUE CREATED

- Reduced flaring by 28%\*
- Reduced CO<sub>2</sub> emissions by 2%\*
- Increased naphtha yield by 5%
- Increased diesel yield by 6%
- Reduced off-spec product by 6%

\*Results based on Aspen ProMV offline simulation.



# Overview

ORYX GTL Limited is a gas-to-liquids (GTL) diesel and naphtha producer located in Doha, Qatar. It strives to be a leading and sustainable energy company by applying innovative technology to its operations. ORYX GTL's diesel has a better environmental and performance profile than conventional diesels derived from crude oil—with a high cetane number, low sulfur, low aromatics and good cold flow characteristics. The company's naphtha is highly paraffinic with a very low sulfur, naphthenic and aromatics content, making it suitable as a quality feedstock for cracking to produce ethylene for the polymers industry.

## Reduction of CO<sub>2</sub> Sent to Flare in the CO<sub>2</sub> Stripper

Carbon reduction has become a top priority for many organizations following urgent calls for industries and countries around the world to commit to 2050 net zero targets. Reducing carbon is also important for oil and gas producers because CO<sub>2</sub> is like a poison to the hydrocracker, making the CO<sub>2</sub> stripper an essential asset as it enables the removal of carbon before going into the hydrocracker. The CO<sub>2</sub> is either sent to the flaring system or sits on the bottom of the column.

With the need to balance flaring and residual CO<sub>2</sub> and avoid major CAPEX investment central to ORYX GTL'S operating strategy, it was critically important to optimize the stripper's performance by balancing the CO<sub>2</sub> sent to flare and CO<sub>2</sub> content at the bottom of the column, ultimately reducing the environmental impact of flared gas and avoiding pump malfunctions. They chose Aspen ProMV, the industry-leading product and process quality analytics solution, to help minimize flaring from its CO<sub>2</sub> stripper and increase yield in the naphtha/diesel fractionator at its Ras Laffan Industrial City facility.



The detailed analysis of three years of historical process data identified those variables with the highest impact to CO<sub>2</sub> emissions as well as any correlations between the variables. A difference in variable behavior showed that flaring in 2021 was 50% higher than in 2018. To further investigate these findings, Aspen ProMV's Optimizer was used to adjust several variables to find the best operating region for the stripper. Models were created to test changes and the team realized that it could potentially reduce flaring by 28% and overall CO<sub>2</sub> emissions by 2% by adjusting process variables.

Because many companies struggle to effectively measure CO<sub>2</sub>, this can be a challenging way to begin implementing sustainability initiatives. ORYX GTL recently implemented a new standard to quantify CO<sub>2</sub> following inconsistencies in lab data versus process data in 2018. The company was also in the process of purchasing new lab equipment. New data would be collected and Aspen ProMV's analysis would be further refined, with an online CO<sub>2</sub> inferential to help monitor CO<sub>2</sub> in real time.



**“The use of AspenTech’s data-driven and analytics models enabled cost-saving measures while creating more stable, safe and reliable operations.”**

**– Dameon Miller, Head of Automation, ORYX GTL**



## Diesel Yield and Quality Improvement, Increased Revenue

The naphtha-diesel fractionator at the Ras Laffan facility was critical for yield maximization and quality control. While there was an APC controller, ORYX GTL acknowledged the need to improve the diesel quality control used in the fractionator's APC because the current inferential quality models were old and did not respond to operational changes that advanced process control could handle. Aspen ProMV enabled the team to analyze process shifts noticed in three years' worth of historical data for a better understanding of the production processes.

Aspen ProMV's Optimizer was used to support process decisions for maximizing diesel or naphtha yield. This tool helped to find the optimal production process to achieve the desired outcome by allowing users to test different process variable adjustments before making any changes in real time. It also identified the best operating region and recommended process adjustments that would increase diesel yield by tighter control and optimization of the diesel quality metric. These recommended changes could potentially increase yield of naphtha by 2% and diesel by 3%.

With the Optimizer's recommendations and key process variables that correlated the most with diesel quality and operating region changes identified, Aspen ProMV was used to create new diesel quality inferentials to replace the old models. Two Aspen ProMV inferentials covered six diesel quality measurements to monitor the diesel quality in real time that were integrated with the APC controllers. The new inferentials were more responsive to feed changes, which reduced product quality giveaway. With this, Aspen ProMV sent early warnings for process health, providing insights for troubleshooting and determining the best course of action and improved APC quality control. This, in turn, could result in a reduction of 6% of off spec production. These changes were estimated to potentially increase yield of naphtha by 5% and diesel by 6% post commissioning of new APC.

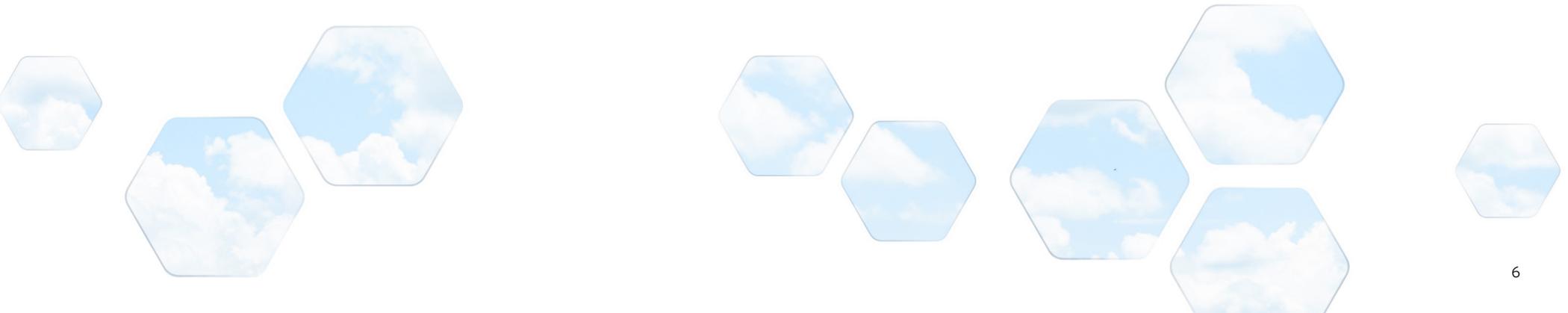




## Conclusion

Product and process quality analytics is a cost-effective way for industrial organizations to improve production processes without any significant CAPEX investments. Having a better understanding of process variables and the effects on production, companies can take the necessary steps to reduce costs, manage environmental impacts, meet production targets, and increase revenue overall. The power of using these tools has been limited in the past to certain skill sets, but Aspen ProMV has been designed by and for Process Engineers and Process Control Engineers.

ORYX GTL was able to use Aspen ProMV to improve its operations and processes. The adjustments made results in the company increasing revenue by increasing yield and reducing its environmental impact by reducing emissions from flaring. ORYX GTL sees Aspen ProMV as a valuable tool that, with the support of AspenTech, could be further refined for even greater results in the future and implemented across other parts of its operations.





### **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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