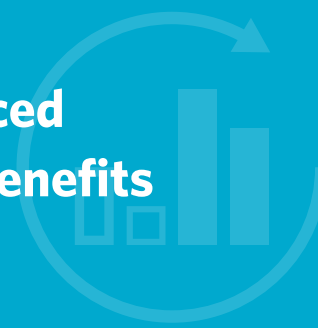




**Next Generation of Advanced
Process Control Delivers Benefits
for Ethylene Manufacturer**



“Aspen DMC3 has benefited many aspects of plant operations — efficiency, throughput, operator satisfaction, APC service factor — and is exceeding our expectations.”

- Richard Wawrzon, Process Engineering and Controls Team Leader, Qenos

5-10%

increase in cold end throughput

CHALLENGE

Revamp APC controllers to enable higher throughput and a consistent supply of high-quality ethylene, despite a fluctuating ethane feed and no full-time, dedicated APC personnel.

SOLUTION

Qenos used Aspen DMC3™ to update models while actively controlling the unit and driving it towards an optimal operating point.

BENEFITS

- More accurate models led to enhanced APC benefits of production, yield and energy efficiency
- APC models were updated with no disruptions to the process
- Adaptive Process Control technology eliminated tedious workflows, freeing up APC resources for more valuable tasks
- Much greater operator acceptance and improved APC utilization
- Integrated and easy-to-use environment enabled more users to engage

Operational Excellence Through Aspen DMC3

Australia's leading manufacturer of ethylene and polyethylene, Qenos, is focused on delivering operational excellence through process safety and asset performance improvement programs. Contributing more than \$1 billion a year to the Australian economy, Qenos is a crucial player in virtually every industry. Qenos has used APC for many years to improve overall plant optimization and ultimately deliver a greater return on investment for all of their stakeholders.

To further drive a culture of continuous improvements at their manufacturing sites in Altona and Botany, Qenos adopted Aspen DMC3 with Adaptive Process Control technology. This upgrade has enabled Qenos to further increase throughput and efficiency, while ensuring a consistent supply of high-quality ethylene, in spite of their fluctuating ethane feed.

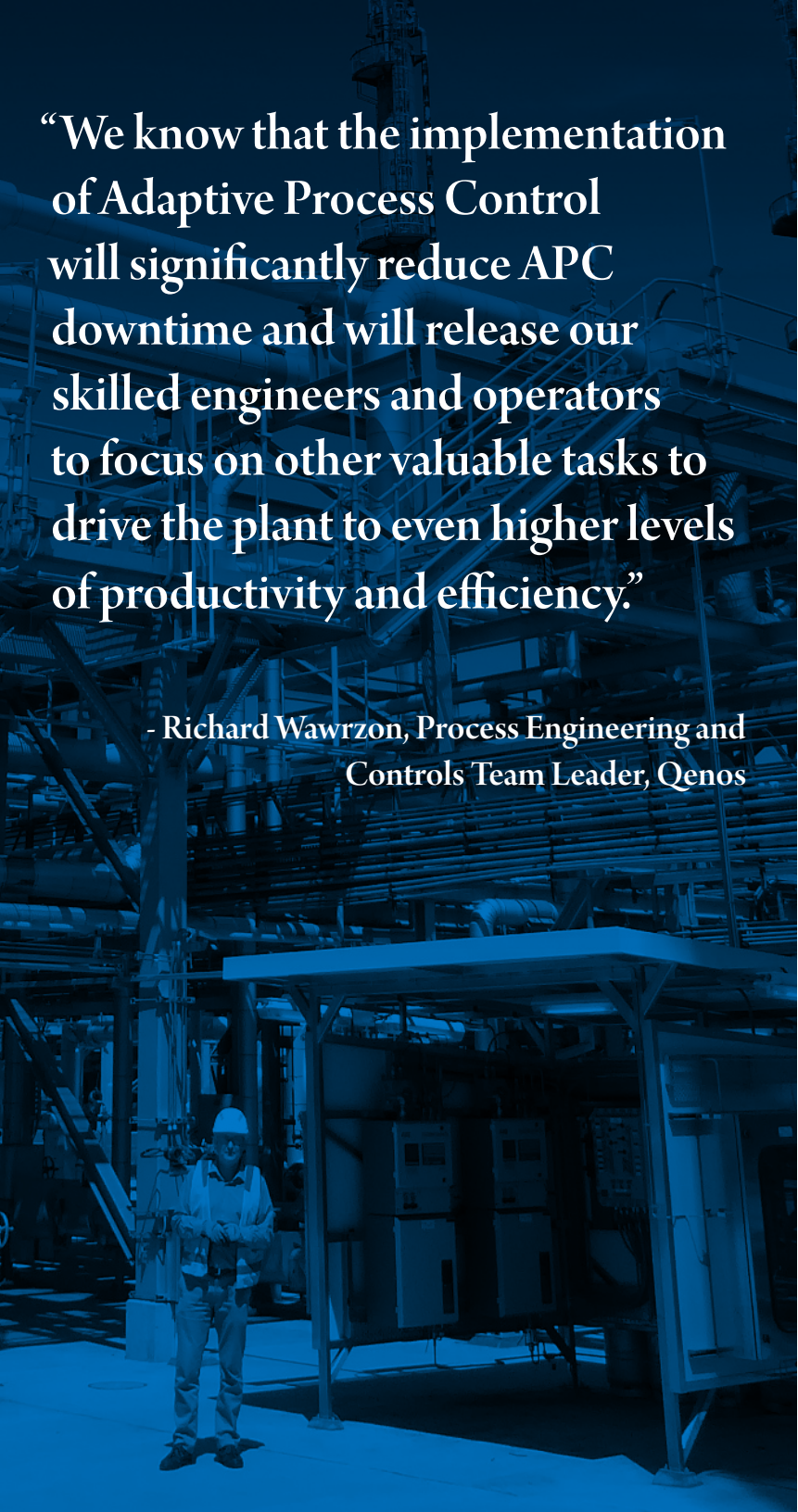
Business Challenges and Goals

The varying ethane feed and underperforming APC controllers resulted in high variability in the demethanizer column. This in turn prevented operations from running lower column pressure and therefore lowered throughput by 5-10%. In the past, revamping an APC controller required extensive projects consisting of many plant tests which was problematic and impractical given the nature of the business. It was not possible to undertake supervised plant tests due to constraints on APC support staff availability and inability to disrupt production.

The overall goal of implementing Adaptive Process Control was to:

- Calibrate the APC models while ensuring a consistent supply of highquality ethylene, despite a fluctuating ethane feed
- Revamp APC controller with very limited APC resources
- Minimize any disruptions to the process during plant tests
- Improve APC utilization and benefits

The decision has had a positive impact, beyond expectations, on efficiency, throughput and operator engagement.



“We know that the implementation of Adaptive Process Control will significantly reduce APC downtime and will release our skilled engineers and operators to focus on other valuable tasks to drive the plant to even higher levels of productivity and efficiency.”

- Richard Wawrzon, Process Engineering and Controls Team Leader, Qenos

Implementing Adaptive Process Control

The deployment of Aspen DMC3 with Adaptive Process Control technology was completed in two days. This included converting the ethylene cold end controller to Aspen DMC3, a hands-on workshop and a verification of the calibrate mode function. In the next five days, the controller ran in calibrate mode, testing the plant while simultaneously optimizing in closed loop. Adaptive Process Control continuously ran small step tests in the background to generate data for calibrating the models. During the test, the controller handled an unplanned change of 20% in feed, without any need for operator intervention. In fact, the operators did not even notice that the controller, while controlling everything within limits, was also gathering data to calibrate models. Production was remotely monitored part-time by the APC support staff.

As the model calibration progressed, the controller suggested revised models when the identification had converged. Further, Aspen DMC3 automated many of the tedious, mundane steps in the model update workflow, freeing up the engineers and operators for more important tasks.

In our specialized world, this does feel like a game changer, as a similar exercise prior to Adaptive Process Control would have been very intrusive to our operations department and costly to all the stakeholders.

Expectations Exceeded

Qenos has made a significant step change in addressing the issues associated with traditional APC technology, e.g., maintaining controllers for sustained benefits. Some of the most significant benefits achieved were:

- Model updates enabled a 5-10% increase in cold end throughput
- APC service factors improved to nearly 100% even with the limited, part-time resource availability
- Controller was revamped in just five days with no disruptions to the process
- Models were updated during normal controller operation, i.e., in closed loop optimizing mode
- Variability in overhead methane was reduced by 40% and tower dP by 20%
- Operator expectations were exceeded and the technology was fully accepted across the site

Aspen DMC3 is the Solution

Adaptive Process Control enabled Qenos to maximize APC benefits with very limited resources available. The technology was easily adopted and widely accepted with minimal efforts or training required. Qenos is very confident that moving forward Adaptive Process Control will be a game changer in the way APC applications are deployed and maintained across their sites.

AspenTech is a leading software supplier for optimizing asset performance. Our products thrive in complex, industrial environments where it is critical to optimize the asset design, operation and maintenance lifecycle. AspenTech uniquely combines decades of process modeling expertise with machine learning. Our purpose-built software platform automates knowledge work and builds sustainable competitive advantage by delivering high returns over the entire asset lifecycle. As a result, companies in capital-intensive industries can maximize uptime and push the limits of performance, running their assets faster, safer, longer and greener.

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