

AMMONIA



Over 150 ammonia plant installations around the globe



One day of lost revenue costs the world's average ammonia plant roughly \$400,000 to \$600,000

With over 150 ammonia plant installations and over 40 years of experience developing control solutions, CCC has a proven track record of helping our customers achieve greater process availability, increased production, and guaranteed energy savings.

As global food demands continue to increase, so do the pressures on ammonia production. With ever-increasing production targets –and oftentimes, aging equipment – our customers are telling us that maintaining process availability, maximizing process efficiency, and ensuring appropriate energy consumption are becoming more and more challenging.

MAINTAIN PROCESS AVAILABILITY

Unplanned process shutdowns cost the average ammonia plant \$400,000 or more in lost revenue per day. As disturbances in your process happen, it's important that you not only stay inside process limits, but stabilize your operation as quickly as possible. General purpose control (PLC or DCS based) does not provide coordinated response of the antisurge protection, process control, and speed governor response, and may not prevent disturbances from causing a shutdown.

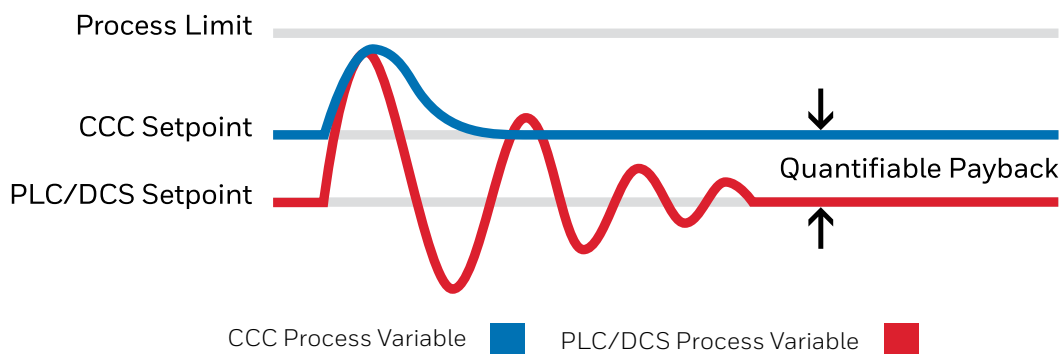
CCC's proprietary algorithms have been refined through years of application-specific experience. These algorithms help you to minimize process upsets and quickly return your operation back to normal in a safe and controlled manner.

INCREASE PRODUCTION

Think what effect increasing production by just 2 percent would have on your operation's profitability and overall success. CCC has been able to regularly achieve between 2 and 5 percent increases in production for our customers. This has been obtained by improving rotating speed regulation or throttling control, reducing or eliminating recycling, and effective limiting control of critical unit parameters.

With CCC control systems, our customers safely operate closer to their process limits, reduce risk of trips, and achieve more process throughput.

Return to stable processes quickly: CCC minimizes excursions resulting from process disturbances





OPTIMIZE PROCESS CONTROL

CCC control systems can provide precise, stable control of critical parameters specifically for ammonia production.

- Natural gas flow to the primary reformer
- Air flow to the secondary reformer
- Syngas pressure at the suction of the syngas compressor
- Suction pressure of the ammonia refrigeration compressor for efficient liquefaction of ammonia

In many cases effective compressor control depends on high quality of turbine speed regulation. CCC has extensive experience in steam turbine control. CCC's Total Train Control systems integrate turbine control, antisurge control and protection, and capacity control to optimize unit performance over its entire operating conditions.

DECREASE LIFECYCLE COSTS

CCC will help you to match your energy consumption with your true production demands.

Do you often run your compressor in manual or at full load? If so, you're likely living with inefficiencies that are costing you money. The CCC control system gives you the ability to run the compressor safely and efficiently by adjusting compressor performance based on production demand. As production demand decreases, CCC systems can reduce compressor power consumption by reducing throughput with suction throttle valves, guide vane modulation, or compressor rotational speed — all while providing reliable antisurge control and protection. Customers typically see a 1–7% reduction in energy costs.

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