

SUCCESS STORY

# ACHIEVING SURGE-FREE OPERATIONS WITH CCC'S PRODIGY® CONTROL SYSTEM

Discover how CCC's proven retrofit solutions helped a global multi-energy provider eliminate surge events and optimize their FCC Air Blower compressor.

Our client, a global multi-energy provider, was seeking to retrofit their existing machinery with a control system to enhance stability, maintainability and control availability. CCC set out to equip the manufacturer's FCC Air Blower compressor with Prodigy — a turbomachinery control platform that leverages more than 50 years of specialized expertise to set a new standard for control innovation.

## The Challenge

At its plant in Europe, our client faced persistent operational challenges, primarily due to surge events and compressor damage in their air blower unit. The existing control system had inadequate responses. Frequent surges, coupled with an underperforming antisurge valve, resulted in inefficiencies and potential safety hazards.

## The Solution

CCC proposed a comprehensive retrofit study to identify and address the root causes of the issues. Our investigation revealed the existing OEM antisurge protection system was underperforming, in conjunction with an inadequately sized valve with a slow dynamic response. Recognizing the urgency, CCC re-engineered the control system to enhance its performance and reliability.

Our experts had already been engaged with the customer since early 2022, providing preliminary support and preparing for a swift execution, despite a tight timeline. Project execution, including panel building, took 12 weeks to complete, plus one month for commissioning activities. Typically, such projects take at least 20 weeks or more to get up and running.

The old control system, integrated into the PLC, had poor response times and was unable to effectively prevent surges. CCC recommended a complete overhaul of the control system, including defining new surge valve characteristics and specifications to ensure proper machine protection. Working with a local engineering firm, the necessary site engineering was developed to redesign the piping configuration and actuation around the anti-surge valve, in addition to cabinet interconnections.

CCC also partnered with a global technology, software and engineering provider to select a newer valve compatible with the existing piping material and installation requirements. To meet the site's unique

cybersecurity requirements, we utilized network switches with special features that also functioned as firewalls. Our subject-matter experts rigorously tested these configurations to ensure compliance and security.

Language barriers posed additional challenges, requiring careful coordination and clear communication throughout the project. Further obstacles were encountered during the commissioning and start-up phases, including unclear process control and start-up procedures, and settings that needed to be adjusted prior to hot commissioning. The PLC adjustments were also refined during this period.

Despite these challenges, our collaborative efforts among the customer and CCC's system and field engineering teams ensured that we overcame these hurdles. During commissioning, an initial performance issue arose due to an overly conservative Surge Limit Line (SLL). After halting the machine and revisiting the control settings, a less conservative SLL was implemented. This, combined with performance tuning at higher FCC throughputs, allowed the system to meet customer criteria and achieve stable control.

Through meticulous planning, expert collaboration and innovative solutions, CCC successfully addressed our customer's challenges, setting the stage for improved operational stability and efficiency.

## The Results

The results of CCC's intervention were transformative. Upon completion, the plant experienced stable operations with no surge events. The new control system automated many previously manual operations, significantly improving efficiency and reliability. The startup sequence, which was a major pain point for the customer, became fully automated and repeatable.

The customer reported satisfaction with the project, particularly during the FAT execution. They acknowledged the need to replace the antisurge valve in the future and expressed confidence in CCC's continued support for valve installation and commissioning. The network configuration and cybersecurity enhancements exceeded the initial project specifications, ensuring robust and secure operations.

Ready to optimize your operations?

**Contact CCC today to learn how our advanced turbomachinery solutions can drive your success.**

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