

CUSTOMER STORY

Reliability and Performance Improvements Combine To Unlock Future Growth Potential

This major national midstream service provider recently completed commissioning of the parallel operation of its refrigeration compressors using complex algorithms developed by Emerson and implemented by Experitec.

The project began with the intention of increasing efficiency and avoiding surge when the plant attempts to operate its two refrigeration compressors in parallel. The facility's operations team expected incremental growth in the deethanizer system and quickly approved this project with the hopes of facilitating future expansion and throughput gains. While historical knowledge from previous engineering studies suggested that the EP centrifugal chiller was likely the next constraint in the refrigeration system, further investigation was required to pinpoint precisely where that limitation would lie.

To launch the project, Emerson performed a site survey to understand the customer's needs and constraints of their existing refrigeration compressors. The resulting report also included a list of recommendations for device-level modifications including new instrumentation and updated valves which would allow the new control algorithms to interface with the customer's Distributed Control System (DCS). Previously, this project would not have been possible given the plant's electrical infrastructure; however, their newly completed electrical building was able to provide the necessary power to run both 600hp compressors. Once these changes took place, Emerson could proceed with the scheduling, implementation, and refining of the performance improvements to the refrigeration process.

Emerson developed a solution using algorithms to share load between multiple compressors and avoid surge. The load sharing algorithm allows the compressors to operate within their most efficient window relative to their compression load. Experitec assisted with the project by adapting Emerson's functionality to look and feel like the customer's existing control systems.

MIDSTREAM PROVIDER

While commissioning the compressor programming, the team ran both compressors in parallel and found that the chiller had much more capacity than initially expected. During commissioning, with the compressors not yet fully loaded, the plant feed rate was increased to 2500 BBL/hour as compared with 2100 BBL/hour with one compressor running, prior that day.

Typically, in warm weather (above ~80 degrees) and high ethane content, the plant had been constrained by the refrigeration system. With the addition of a second compressor in parallel, the project team greatly reduced the number of days that refrigeration would be a limiting factor to overall facility throughput. In addition to the production capacity gained, the reduction in load and improved efficiency of the compressors are expected to increase operational reliability over the long term, leading to even further areas of sustainable performance and net profit gains.

BUSINESS BENEFITS

Plant Constraint Eliminated

215 $\frac{\text{Days}}{\text{Year}}$ → **0**

Production Capacity Increased

+400 $\frac{\text{BBL}}{\text{Hour}}$

Production Opportunity Gained

+\$4M /Year

Results like these aren't always typical but they underscore the likelihood that operational and reliability improvement initiatives often overlap. Implementing sophisticated models, such as these, reveals the interrelationship between automation and reliability technologies. The fact that this site will benefit for years from reduced strain on their systems, people, and utility bills is just an added bonus to why ROI can be found in process and asset optimization projects.



Learn More About Our Reliability and Operational Technology Programs.

Experitec has served the industry for over 100 years, partnering with our customers to gain competitive advantages and unlock the hidden potential in their facilities. By optimizing operator and control performance, improving asset reliability, creating safer places to work, and helping clients reach their environmental and sustainability goals, Experitec is dedicated to achieving positive outcomes for the businesses we serve. Our unique long-term partnerships with Emerson and others enable us to connect customers with innovative technologies, subject matter expertise, and 24/7 lifecycle support and engineering services. As employee owners, the Experitec team is eager to partner with you on your next automation or reliability project in a positive, driven, and collaborative way. We have local offices in St. Louis, MO; Kansas City, MO; Memphis, TN; Calvert City, KY; and Decatur, IL; as well as warehouse and service locations in the surrounding areas.