DEPENDABLE GAS TRANSMISSION

Ensuring continuous compression station operations

A catastrophic failure at a compressor station of a large natural gas pipeline company and resulting fire caused nearly $600,000 in damages and lost natural gas. Fortunately, the rural location meant there were no injuries or lives lost and damage was limited to the facility itself.

This event, and several other incidents, led the company to examine their 15,000 miles of pipeline, spread across 16 states, which transports over 1 trillion cubic feet of natural gas per year to their customer base. The resulting modernization report recommended significant upgrades to their aging system that would enable them to be compliant with new regulations such as the Control Room Management (CRM) regulations issued by the Pipeline and Hazardous Materials Safety Administration (PHMSA).

Critical to the pipeline company's upgrade plan was the implementation of fully redundant compressor stations—compressor pumps/turbines, valves and safety and control systems—as mandated by the CRM regulations. While it was easy to implement redundancy for Programmable Logic Controllers, power and network services, creating an always-on fully redundant computer platform to operate their SCADA, historian, HMI and related control system applications remained a challenge. Additionally, a key element in the overall operational upgrade was the use of Big Data analytics to proactively detect compressor station problems so they could be addressed before unplanned outages, or catastrophic failures occurred.

The initial solution deployed was 3 standard computer servers at each compressor station, each running one of the critical applications. Unfortunately, this solution had multiple weaknesses. The company recognized that they would eventually need 6 to 8 servers in each location for the range of applications they would need to support. Given their space and power constraints this was a significant problem and it would be even worse when the servers failed. To get a compressor station fully operational required reconfiguring its exact operating environment back at headquarters and then driving it to the location to perform the install and re-cabling. This would generally take 2 to 3 days. As for the analytics, the loss of any data from a compressor station meant sub-optimal results which defeated the objective of increasing overall operational efficiency.

The pipeline company sought an alternative solution that didn't have all the downside issues associated with the multiple server approach. Their Industrial Automation supplier recommended a virtualization solution to decrease the number of servers required and the associated service burdens. While this would reduce the number of servers, it would significantly increase the complexity of the control system solution resulting in the need for a trained specialist to conduct maintenance. The ultimate solution was to use ftServer® platforms from Stratus®. This always-on platform provided all the attributes the company was looking for—an operationally simple system they could rely on to run their virtualized applications remotely without IT expertise and real-time analytics without data loss for complete operational visibility.

Since implementing the ftServer platform in 2014, the pipeline company has remained up and running with zero downtime or data loss.

> "We can get a lot more flexibility by adding applications in the compressor stations without the need for IT expertise."
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> **Lead Automation Electrical Engineer**

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