

EPA Fines Avoided with Highly Reliable Emissions Data System

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A leading manufacturer of ceramic proppant for the oil and gas industry was seeking an emission data collection and reporting solution that would provide greater reliability and uptime when compared to their current system. EPA requirements limit the amount of data gaps allowed in the emission record. Data gathering and/or reporting gaps could result in large penalties being imposed, regardless of whether the emissions were in compliance or not.

Polytron recommended and implemented a Wonderware Archestra-based redundant server system that provides uptime reliability in two separate ways:

1. Server redundancy means a single server failure will not interrupt data gathering capability. Dual object servers were deployed and use a redundant engine. Each server has dedicated I/O connected to the PLCs. This provides uptime in both unplanned and planned downtime situations. For example, to apply an operating system upgrade to the object servers, one of the servers can be brought down while the other continues to run and collect data. After one of the servers is upgraded, the system can be forced to fail over so that the other server can then be upgraded.
2. Store and Forward for Historian means that in the event of historian failure or required maintenance, data is cached on the data gathering servers until the historian is available again. The cached data is then be seamlessly integrated into the historical record as if the downtime did not occur. This function is important for the EPA record since it minimizes any gaps in the data due to the historian being down.

In addition, emission sensors were monitored for failure and preventive maintenance. Archestra graphics were integrated into the existing plant HMI to report sensor outages. When a sensor failure occurs, an Archestra graphic prompt automatically appears informing the operator of the type and severity of the outage. In addition, preventive maintenance controls also are available to maintenance personnel so they can diagnose and repair the sensors. Periodic testing of the sensor alarming system also can be performed using the graphics. This functionality is seamlessly combined with the legacy InTouch system. Archestra graphics co-exist and are blended with the original HMI screens.

Reusable code allowed the design to be deployed quickly and easily to multiple plants in the enterprise, despite different control system vendors and architectures. For example, one plant has Allen Bradley PLCs and another has Modicon. The same templates were used for both sites and were built to handle the different control hardware. This minimized rework, testing, and checkout. Changes from the first deployment site were easily rolled into the subsequent sites.

After the Archestra infrastructure was in place, subsequent projects added enhanced functionality to their existing plant HMI application. Additional templates and graphics were developed that used the established Archestra infrastructure to add enhanced functionality to the existing legacy system. Entire subsystems were converted to 100% Archestra implementation while maintaining the look and feel of the existing legacy system. This allowed operations to use the converted system from day one without retraining. The converted systems benefit from the fail-over redundancy and store-forward capability established in the original project. In addition, code reusability allowed the converted system to be rolled out to other sites.

In summary, Polytron recommended an architecture and technology solution that met the customer's requirements for minimizing any gaps in their emissions data collection and reporting in order to achieve regulatory compliance and avoid any penalties.

A member of the Control System Integrators Association (CSIA), Polytron applies project management and engineering expertise in hundreds of engagements with many of the world's largest companies, including the food and beverage, pharmaceutical, consumer goods and water and wastewater industries.

The Control System Integrators Association (CSIA) is a global non-profit professional association that seeks to advance the industry of control system integration for the success of members and their clients.

Author Bio

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Chris Parkinson, senior engineer, Polytron, is a graduate of the Georgia Institute of Technology and has worked as a control systems engineer for almost 20 years. He joined Polytron in 2003, delivering HMI and data tracking solutions for Fortune 500 companies