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# Air Products Wichita Plant

## Migrates to Siemens PCS 7 Distributed Control System

Siemens global automation alliance partner Air Products and Chemicals, Inc. leads by example in finding ways to reduce costs, increase quality, and reduce downtime.

A good case in point is Air Products Wichita, Kansas, US, site. Cost reductions and efficiency improvements at this "sold out" facility are going straight to the bottom line.

Based in eastern Pennsylvania's Lehigh Valley near Allentown, and operating in 30 countries, Air Products is a top world

supplier of gases, chemicals, and equipment to high growth markets, including electronics, performance materials, refinery hydrogen and energy, and healthcare.

To stay on the leading edge, the Wichita plant has completed the first of two phases migrating from a

20-year-old continuous process control system to Siemens SIMATIC® PCS 7 distributed control system with SIMATIC BATCH management software. They used an integrated approach to control and safety, reducing the complexity of having two separate systems, by creating a common engineering environment and a unified operator interface. Air Products also selected PROFIBUS open fieldbus technology for an automation upgrade at the plant's drumming and blending facility.

By the end of 2005, Air Products expects the automation upgrades will help reduce costs by several million dollars. The savings will come from a combination of improved product yield, lower energy costs, and reduced requirements for raw materials and laboratory analyses. The migration also successfully preserved Air Products existing investment in field wiring and devices.



### Migrating from Legacy Control System

The first phase of Air Products Automation Control Initiative (ACI) focused on its South Plant, a hydrogen reaction facility specializing in polyurethane curing agents, and additives sold to chemical, coatings, paint, and foam companies. Depending on customer orders, the plant normally produces 35 different products, but has the capability of manufacturing up to 250 products.

The project team was given only 21 days to complete the installation that would control the 75 unit vessels and 50 equipment modules at the South Plant before cold weather set in. During the outage the team installed the new PCS 7 system, made sure more than 2,500 I/O points were transitioned, and tested the SIMATIC BATCH software configuration for product production sequencing.

In addition, all wiring from existing field devices up to the terminals was retained and undisturbed. Air Products kept the existing TDC3000 field terminal assembly (FTA) cabinets, but replaced the FTA boards, one-for-one, with Siemens FTA boards. No additional cabinet space was required.

Eighteen days after taking the process down for migration, the plant was up and running – three days ahead of schedule.

“The startup went very well,” Plant Manager Ramon Lopez said. “We had around-the-clock coverage from a cross functional team. Any issues were quickly resolved during the Site Acceptance Testing (SAT), and nothing delayed the critical timing of the startup.”

Lopez said the time devoted to the startup was greatly accelerated because SIMIT simulation software was used during the FAT at Spring House and to train the operators. The SIMIT simulation software, which makes use of the existing controller configuration to generate the simulation program, allowed simulation of values of all the I/O points without modifying the actual system configuration. In addition, operators were able to practice with the graphics and batch manager software before startup. Today, Lopez said operators receive on-the-job training because of the intuitive and easy-to-use qualities of the PCS 7 system.

The PCS 7 control system installation included four Siemens SIMATIC S7400 controllers, a redundant pair of Siemens process safety HF systems, a redundant pair of operator system servers, six operator system multi-clients, one engineering system server, and a standalone operator system archive. The Safety Matrix engineering tool was also used to help simplify the configuration of the safety system.

### **BATCH software helps production**

Lopez also expects to increase the capacity of the plant and improve visibility of the process with the new software.

“We now have a more precise way of making our chemicals, and it will be consistent, shift after shift, hour after hour,” Lopez said. “That reduces raw material costs. Being able to operate the equipment consistently all the time will also reduce the maintenance of that equipment. Reducing downtime by five percent is a big improvement.”

The control system and S88 reporting features of the BATCH software simplify troubleshooting the plant. In the past, operators read some of the plant information directly off of panel mounted controllers. The information was available at that moment, but there was no way to automatically log the information for future reference.

Today, all information is reported automatically through the PCS 7 system to the control room and logged into electronic history.

### **PROFIBUS pays off**

As part of the automation upgrade at the plant’s drumming and blending facility, Air Products installed a SIMATIC PCS 7 process control system using PROFIBUS as the fieldbus for field device integration. The control system and PROFIBUS accommodate multiple vendors’ equipment. Embedded diagnostics, enabling preventative and predictive maintenance, help keep operating costs low.

“Implementing PROFIBUS has set us up for a leap in technology and engineering,” said Lopez. “We also get better commissioning and long term maintenance.”

At the beginning of the project, Air Products worked closely with Siemens engineers and a consulting firm specializing in design and implementation of fieldbus systems to develop the technical layout. A traditional star topology was chosen to accommodate anticipated future expansions and retrofits.

The results have been impressive. Material, labor, and field installation costs have been reduced by approximately 30% after one year of operation.

Eighty smart devices from multiple vendors at the drumming and blending facility communicate with the SIMATIC PCS 7 process control system via PROFIBUS.

The devices include Micromotion mass flowmeters, Fisher valve positioners, Emerson and Siemens transmitters, Mettler-Toledo weigh scales, SIMOCODE motor control and protection devices from Siemens, and Endress+Hauser level switches.

The fieldbus system includes both PROFIBUS DP and PA layers to accommodate common devices, including transmitters and valve positioners, as well as smart motor protection and control devices. PCS 7 operator stations are located in Class 1, Division 2 process areas in suitable enclosures. The field devices can all be accessed from a central location, if necessary, for maintenance purposes or to make configuration changes.





*“Siemens support was very good,” Lopez said. “We worked as a team and nothing delayed the timing of any of our activities. Our expectations to reduce costs, increase quality, and reduce downtime are being realized.”*



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