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Automation and Process Control

The glass industry faces challenges to become more efficient, both from an energy and a productivity standpoint. These challenges include the effects of globalization, rising energy costs and CO₂ issues, and how the industry will remain relevant in terms of innovation.

For years, the industry has viewed automation and instrumentation as necessary. Some areas of the process adopted advanced automation and instrumentation techniques sooner than others. For example, the container industry due to the complexity of high-volume forming needed integrated solutions to achieve high rates of productivity.

Due to globalization, employment and capital allocation tend to shift to areas of lower costs. So, for the West in particular, it is critical to consider utilizing advanced automation and instrumentation.

A revolutionary approach is needed. This statement is taken from “A Technical & Economic Assessment” of the US Glass Industry sponsored by DOE:

“Full-scale automation from batch to product could maximize profitability by increasing production efficiency and minimizing excessive waste from miscalculation or human error. Total automation of existing glassmaking systems could help avoid the high risk of experimentation and increase the profit margin. Producing glass in a smarter and faster manner with less human involvement has never been more critical”

Plant operators need systems that can look at automation and power on an integrated basis. These systems should be able to configure all weighing systems, field devices and analyzers from the control room and handle the management of all these assets.

Saint-Gobain Modernization

A number of companies can provide such systems. Let’s take a look at Siemens Energy & Automation’s Simatic PCS 7 process control system.

When Saint-Gobain’s facility at Chantereine, France, needed a cold repair on one of the two lines, the float lines were modernized, and the power distribution for medium and low voltage and the digital control system upgraded. The Teleperm M control technology was migrated to Simatic PCS 7.

The new system controls the entire plant, from the composition of the raw material mixture to the end of the cooling lehr. Personnel in the production control room can control and monitor the processes in the batch section, on and in the melting furnace, in the float bath, and in the cooling lehr, including the utilities from the operator stations.

Operator stations communicate with each other via an optical Ethernet network. Two PCs manage the database containing all the information collected from the automation systems. Using a Fast Ethernet network, the servers communicate with the automation systems for the furnace, the burners, the top rollers and the power distribution for the factory.

Two Profibus DP bus systems connect process control to the various areas in the process where distributed Simatic ET 200M and ET 200S devices are used as I/O. Profibus PA is used for connecting the process instrumentation.

Sixty smart digital Sitrans sensors were installed in the glass production process to measure pressure, flow and temperature. These are connected directly to the control system via Profibus DP. The sensors can be calibrated and programmed through PCS 7, which saves a considerable amount of commissioning time.

With the selection of Simatic PCS 7, Saint-Gobain has a process control system that can be linked to the IT level of the company. Jean-Paul Rischmann, head project manager, stresses one economic advantage: “Up till now our plant was controlled by a Teleperm M system from Siemens. The installation of the PCS 7 system meant that the majority of the older peripheral devices could still be used, and thus, the costs for the conversion were kept low.”

Some may consider this example to be “evolutionary”, but one can see that all the modules are in place to totally integrate automation and power. It brings all aspects of control, automation, power and asset management under one system. Gone are the “islands” of control that sometimes cannot communicate with each other. It also helps promote solutions for energy efficiency, pollution reduction and innovation.

As one significant step toward viability and growth in the 21st century, GMIC encourages forward thinking members of the glass industry to take a serious look at integrated automation and instrumentation. GMIC would gladly coordinate a program to present various alternatives.

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