AVEBE deploys PlantPAx to enhance quality, productivity and flexibility

Food factory for potato starch industry migrates Legacy DCS, improving infrastructure and process automation operations thanks to Rockwell Automation

Solutions
A PlantPAx process automation solution running on virtualised (VMware) architecture with EtherNet/IP fibre ring topology based on EtherNet/IP:

- Allen-Bradley ControlLogix L73 PAC
- Allen-Bradley Point I/O on DLR
- FactoryTalk Historian
- FactoryTalk AssetCentre for controller backups and version control (compliance to 21CFRpart 11)
- FactoryTalk Batch for seven Reactors - start-up in January 2013
- Allen-Bradley PanelView Plus 400
- Allen-Bradley PowerFlex 755 Drives

Results

- Rapid software development
- Rapid replacement and expansion via VMware architecture
- High performance and high availability of technical installations
- Shorter development time for new production procedures
- Easier access to manage control system and hardware for maintenance service
- Faster time-to-market for new products via batch recipe management
- Better product quality and higher reproducibility
- Lower maintenance costs
- Considerable savings on server/PC hardware, energy and space

Background

AVEBE, based in TerApelkanaal, The Netherlands, is the world’s largest producer of potato starch and its derivates. Annually the company processes 4 million kilograms of potatoes, producing 700,000 tons of starch and derivatives which are subsequently used in hundreds of food and non-food products.

The company is currently working on the construction of an entirely new process installation for its food factory. In parallel it is also developing a new Reaction Department and Central Control Room; three substantial projects with a total running time of three years. Before, the food plant was outdated and only partially automated, therefore a lot of work was still carried out manually.
Challenge

In his position as project leader at AVEBE, Peter Nomden has been closely involved in this extensive project since the very beginning. Nomden explains: “Island automation had taken hold of the old factory and for process control, we were using a system that no longer met our needs. Realising our set targets required a great deal of work, we set to work on three projects simultaneously: a new Central Control Room, the construction of the ingredients section of the factory – we call it the reaction department – and the process control for the whole food factory. We want one single control system, which must be flexible as we also need a connection with our MES system, lean logistics throughout our entire plant, integration of in-line measurements and a higher availability within the food factory.”

With the new installation, AVEBE is aiming for a higher production capacity, improved manageability and higher reproducibility. It also wishes to achieve a higher end-product quality level, and to work with less personnel, as suitable staff is becoming scarce. Other goals include a decrease both in the use of raw materials and in waste.

Solution

Nomden elaborates: “Our starting point was the foundation of a project group with three different parties, including engineers from Rockwell Automation, Actemium and AVEBE Engineering. We jointly worked on a solution centered around PlantPAx from Rockwell Automation. “PlantPAx is a process control solution, which also encompasses DCS and PLC functionality,” he continues. “The main reason behind this choice is that PlantPAx couples a proven technology with an integrated architecture. We work with a phased approach; a preliminary procedure lasting 1.5 years and an implementation of 1 year, plus a validation phase. We want everything to be operational by the end of 2013,” Nomden explains. “In the future, we wish to transfer all of the production lines to PlantPAx. We are starting with the lines from the ingredients and the food factory to the Central Control Room implementing new Rockwell Automation hardware and software and reusing whenever possible existing I/O from the legacy DCS previously installed.”

The functionalities covered by FactoryTalk Historian include the storage of historical data for reports and analysis for process improvements. Furthermore, FactoryTalk Historian makes information on production, KPI’s and dashboards accessible. FactoryTalk Asset Centre offers functionalities such as the storage of documentation and application software, the analyses of operator actions as well as a central storage facility for PLC software.

“Our new infrastructure consists of a central server location, sprouting different redundant fiber optic ring connections. Connected to these is the Central Control Room with only Operator servicing stations (Thin Clients). Furthermore, a fiber optic ring runs through the production locations with CISCO switches and process controllers. Each process controller has an Ethernet/IP
ring (Device Level Ring) with remote I/O, MCCs, Variable Frequency Drives and valve islands. These ring structures allow for a high availability, flexibility and transparency,” Nomden explains.

Results
AVEBE now has a process control solution that can function as the standard for other AVEBE production branches. “The new factory is state of the art, and can be seen as our calling card,” Nomden enthuses. “For us, the added value of PlantPAx is found in the standard hardware and software.” Nomden elaborates. “The software includes, for instance, a standard library with Process faceplates for operating motors, pumps and solenoid valves. The VMware (VirtualMachineWare) technology, which has already been widely applied in office environments, is of great importance to us,” Nomden explains. “AVEBE is the first industrial user in Europe that has installed its entire process control on a virtualised environment, meaning that all system and application software, such as FactoryTalk Historian and AssetCentre, HMI, Batch and SQL, is installed on Virtual Machines. By applying this technology, we are now able to run five virtual machines on one single server. This server runs as part of a group of three servers, which we can divide into many Virtual Machines, while at the same time providing redundancy. This yields a considerable saving on server/PC hardware, energy, space and maintenance fees. Since the complete installation will be operational in 2013, at this moment there is not so much we can say on the potential savings in terms of usage of raw materials and waste reduction.” Nomden concludes: “The flexible attitude of the people from Rockwell Automation and Actemium greatly appeals to us. You always feel that they want to think along with you. The collaboration is very pleasant. They always respond quickly to special requests.”

Additional Information
www.rockwellautomation.com

The results mentioned above are specific to AVEBE’s use of Rockwell Automation products and services in conjunction with other products. Specific results may vary for other customers.