Simatic PCS 7 Version 7: Beyond limits
Totally Integrated Automation at B. Braun in Melsungen: Production for the future

Ingredients for Efficiency
Integrated automation and drive solutions for the sugar industry
Braunschweigische Maschinenbauanstalt AG (BMA) makes use of Siemens drives to perfect both performance and efficiency in its sugar centrifuges.

Mechanical assets can be integrated into plant asset management systems by an intelligent evaluation of process data.

Hamburg Grain Terminal benefits from the excellent performance and versatile integration capabilities of the Siwarex FTA weighing system.

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Sugar Industry

Success Is Sweet

Process automation with Simatic PCS 7 in Russian sugar factory
In 1996, Siemens AG presented its first PLC-based process control system, Simatic PCS 7, in Rotterdam. In the 10 years that followed, the system underwent continuous technical developments and is now a full-blown DCS. In Version 4, redundant operator stations and interfaces for Profibus PA were introduced, and with Version 5 a multiclient/server architecture and fail-safe, highly available systems. Version 6 was distinguished by higher scalability and performance. As a central part of TIA (Totally Integrated Automation), Simatic PCS 7 is now operating successfully in thousands of implementations around the globe. We are now presenting the seventh version of our process control system, which offers significant added value to system owners in various fields. You can find out more about this on pages 6–7 and 14–15 of this issue.

This issue also focuses on our Hannover Fair presentations, paying special tribute to our solutions for the oil and gas, chemical, food and beverage, and machine-building industries. Among our solutions for the food and beverage industry, we focus on the sugar industry and our work with experienced partners in this industry (see pages 8–11). Sugar, however, is also an important renewable resource that can meet some of our future energy needs. Our systems can support the efficient production of “green energy” by making processes safer and more flexible and profitable – for example, in the production of ethanol from sugarcane or in emissions control for biomass power stations. The latest discussions on CO2 emissions make this a very relevant subject.

I hope this issue of Process News has made some useful suggestions, and I look forward to seeing you at the Hannover Fair!
Bell's Brewery invests in Braumat PCS 7

Future Perspectives

Bell's Brewery, based in Kalamazoo, Michigan, ordered a Simatic PCS 7 Boxsystem Braumatcompact for the temperature control of 76 fermentation tanks. The value of the order is US $ 42,000.

Braumatcompact was chosen as the preferred system because it offers the possibility to invest in a compact, cost-effective temperature control system today and the system is scalable to effectively address the total brewery automation needs for the future.

Immediate plans after the initial installation are to integrate other OEM-supplied equipment and link several existing S7-300/400 controllers into PCS 7. Future plans aim at using Braumat as a control system for the entire brewery.

Find out more: www.siemens.com/breweries

Sitrans LR 400 wins “Innovative Product 2005” award

Chinese Success Story

A team of experts from China Industrial Control Net, the premier network media in the area of industrial control and automation, has awarded the Sitrans LR 400 the prestigious “Innovative Product 2005” award. With its high level of performance, the Sitrans LR 400 continues to impress an increasing number of Chinese end users, especially in the cement, fly ash and aluminum industries of China.

The Sitrans LR 400 has won the favor and trust of cement firms in China and in many other countries because of its ability to measure the dusty applications of a cement plant reliably. For example, Weiqiao, one of China’s major privately run state-of-the-art aluminum smelters, is installing Sitrans LR 400 transmitters in a new two-phase aluminum smelter project at its Beijing plant to help the company meet aggressive production targets.

GaoTian Cement also installed Sitrans LR 400’s on its homogenizing, clinker storage, kiln dust, and finished cement silos at its new, highly productive, pollutant-free plant.

Find out more: www.siemens.com/level

Sitrans FM MAGFLO in an application near Lake Constance

Optimum Link

The Zweckverband Bodensee-Wasserversorgung (Lake Constance Water Supply Association) has placed an order with Siemens for 37 Sitrans FM MAGFLO magnetically inductive flowmeters. The multifunctional devices are used in pumping and processing operations for monitoring the axial face seals of turbines and pumps and the cooling water flow. An integrated Profibus DP module enables optimum networking with the Simatic S7 controller. Current process information can therefore be accessed from any HMI computer at any time.

A unique, patented test method compares the measured data with the original parameters and logs the data. The flowmeter insulation test and the measuring transducer and sensor magnetic field tests are carried out in a single test step. This optimally meets the high demands of ISO 9000 compliance.

Find out more: www.siemens.com/flow
New production facility for process instrumentation to supply the Chinese market

Serving the Chinese Market

Siemens has invested 200 million RMB to set up Siemens Sensor and Communications Ltd. (SSCL) in Dalian, China. The new production facility will manufacture and develop sensors and communication devices. In the first step, the new company will enable Siemens to locally produce process instruments and weighing products and to better serve Chinese customers in the rapidly expanding process industries.

Covering a total area of 40,000 square meters, SSCL will be built in two phases. Production will commence shortly. The R&D division in SSCL will constantly push innovations and develop new products tailored to the local market. The establishment of SSCL will further strengthen the leading position of Siemens in the process automation market.

Find out more:
www.siemens.com/processinstrumentation

Abfallverwertung Augsburg GmbH modernizes process analytics for flue gas monitoring

Complete Modernization

AVA (Abfallverwertung Augsburg GmbH) has modernized the flue-gas emission monitoring of its three waste incineration lines in accordance with the German 17th Federal Emission Protection Directive and upgraded them with process analytics from Siemens. The flue gas analytics now use Ultramat 6 gas analyzers for the measurement of CO, NO, and SO2; a Fidamat 6 analyzer for the total hydrocarbon content measurement; LDS 6 devices for measuring HCl, NH3, and H2O; an Oxymat 6E analyzer for the oxygen measurement; and D-RX 250 combination probes for the measurement of dust, flue gas speed, temperature, and pressure.

The measurement instruments of furnace line 3 were upgraded in July 2005 in four weeks. The gas sampling probes, sample gas pipes, and sample gas cooler were also upgraded or serviced. The TÜV tested and confirmed the correct installation and functioning of the analyzers, and the devices were then calibrated four weeks after the commissioning of furnace line 3. The process analytics systems of furnace line 2 were exchanged in October 2005, and the measurement instruments of furnace line 1 in January 2006.

Find out more:
www.siemens.com/processanalytics

AstraZeneca opts for Simatic automation technology

Globally Recommended

Recently, global corporate account AstraZeneca officially announced that the Siemens products Simatic PCS 7, Simatic S7, and Simatic WinCC have been named as "Recommended Product" within AstraZeneca.

The term "recommended" means that these products are now among a very limited number of recommended products that AstraZeneca has decided to primarily use for its facilities worldwide within the product category concerned. "Recommended Products" will generally be given preference when AstraZeneca determines supply sources for capital projects and relevant OEM suppliers.

Find out more:
www.siemens.com/pharma

Find out more:
www.siemens.com/processanalytics

Find out more:
www.siemens.com/processinstrumentation
The new Simatic PCS 7 Version 7.0 offers plant operators many advantages

Beyond the Limits

Eleven years after presenting the first version, Siemens AG is now introducing the seventh version of the Simatic PCS 7 process control system, with the tagline “Takes you beyond the limits!” Version 7.0 helps plant operators and engineering companies in quickly and efficiently implementing solutions for process automation and allowing safe and economical operation of the plant – flexibly and for almost all processes and process types.

One of the central new features of Simatic PCS 7 V7.0 contributes directly to greater safety and availability of plants. The integrated alarm management system logs all alarm messages but, with the Smart Alarm Hiding feature, is able to distinguish irrelevant from relevant alarm messages and display only relevant messages on the operator stations. This helps reduce the operating personnel’s workload and creates time for processing alarm messages relevant to safety.

Siemens AG

Simatic PCS 7 V7.0: Key features

- Intelligent alarm management
- Extensive IT security concept
- Advanced fieldbus integration capabilities for Profibus, HART, and Fieldbus Foundation
- Profibus PA redundancy
- Close-to-process asset management, including management of mechanical assets
- Extensive tracking and tracing features
- Flexible data archiving and communication via OpenPCS 7
In addition, it is possible for the operators to hide flutter alarms due to a defective sensor. These hidden alarms are displayed again after certain time intervals so that no alarms are lost. In addition, the system operator is actively supported in his or her work by alarm prioritization, alarm categorization, and extended handling instructions.

**Improved security for networks and plants**

The increasing networking of individual plant levels and the wide distribution of standard IT systems based on Microsoft Windows increase the risk of virus or hacker attacks in automation and process control systems as well. The new version of Simatic PCS 7 therefore offers an extensive industrial security concept based on the coordinated interaction of various individual measures such as encryption and firewalls and a structured security architecture. Central user management guarantees that only clearly authenticated users with clearly defined roles and rights have access to the system. The user management system is based on Windows user management and is smoothly integrated into the engineering and operator environment as well as Simatic Batch. In addition, the security concept includes efficient management of Microsoft patches and support for both Windows Firewall and the Simatic Scalance S security modules, as well as the ability to easily integrate the most important virus scanners used in automation technology.

**More options for the process level**

To give plant operators more options for the process level, the new version of Simatic PCS 7 provides interfaces to connect field devices via Foundation Fieldbus in addition to interfaces for Profibus and HART.

In addition, thanks to a newly developed concept consisting of couplers and intelligent field distributors on the hardware side, a redundant Profibus PA network can now be set up. Full process control is guaranteed even in the case of coupler failures, short circuits, or cable breaks, as well as missing bus termination. The concept has a scalable design and ranges from simple coupler redundancy to full ring redundancy. The redundant Profibus PA ring can be enlarged or reduced at any time by adding or removing active field distributors (AFDs) – even during operation. The devices connected to the coupler can be visualized on the operator stations by Simatic PDM and are also integrated into the close-to-machine asset management system by EDD (electronic device description).

**Smart maintenance for mechanical assets**

For monitoring mechanical assets such as heat exchangers, tanks, pumps, or package units, an automation system proxy has been developed. This component can trigger maintenance alarms for mechanical assets in the asset management system. These alarms are then displayed to the service personnel on the maintenance station. Variations from the regular operating state can be determined from different process values and their deviations from defined standard states using the programmable logic component. Individual diagnostic structures can also be set up with their own diagnostic rules and condition-monitoring functions.

**Detailed information and higher visibility**

Plants that are subject to validation procedures make greater demands on traceability and archiving, including, among other things, access control, version management, and traceability by change logs, which are strictly regulated by the US Food and Drug Administration.

But it is not only the operators of plants with mandatory validation who benefit from the implementation of these requirements. The recording possibilities of the change logbook include all online changes in automation and operator systems, batch management or route control changes, and the recording of library changes as well as CFC and SFC elements. All these functions considerably simplify process optimization.

In addition, the new version of Simatic PCS 7 also provides an interface for the simple exchange of process data with master systems for process data evaluation as well as production planning systems: the OpenPCS 7 interface, which is based on the OPC (OLE for process control) specification, the standard for manufacturer-neutral communication in automation technology. An optional OpenPCS 7 client/server package simplifies access to process data, which now converge at a central point.

**Safety and efficiency**

With these additional functions and countless other improvements, the new version 7.0 of the Simatic PCS 7 process control system helps plant owners and engineering companies exploit many different possibilities to guarantee safe and economical process control for the entire life cycle of the plant.

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**Find out more:**

www.siemens.com/pcs7

E-mail: roland.wieser@siemens.com
Collaboration between BMA and Siemens in the sugar industry

Driving Performance

Centrifuges are a key technology in sugar production. One of the world’s leading manufacturers of sugar centrifuges is Braunschweigische Maschinenbauanstalt AG (BMA). In an interview, Dr.-Ing. Rolf Mayer, BMA CEO, and Wilfried Rother, technical manager of BMA Schaltanlagen GmbH, explain why their company relies on Siemens as a supplier.

How does the future look for the sugar industry, in your opinion?

Rolf Mayer: We see a strong growth market, not only in the food and sugar industry but also in the processing of regenerative raw materials in general – a trend that will be influenced ultimately by the increasing use of biomass as a source of energy. Our customers are demanding concrete increases in performance in conjunction with a reduction in costs with every investment. There is also a need to reduce energy consumption and the strain on the environment, and to meet stricter and stricter legal requirements – not to mention an increasingly aware public that expects absolute quality.

And how important is automation and drive technology, in your opinion?

Wilfried Rother: Today we are achieving mechanical performances that would have been unimaginable a short time ago. And we are working on further perfecting process technology through the smooth interaction of machine technology, drive technology, and automation. We are now working with drive powers of up to 1.3 megawatts and torques of up to 13,000 kilonewton meters. All that in continuous operation over several months. This demands a robust drive. In addition, complex plants such as sugar factories can only be operated these days with state-of-the-art automation technology. The automation technology of the machine itself is an inseparable part of the manufacturer’s scope of service.

You have been using Siemens products for years.

Wilfried Rother: Siemens offers us the whole range of electronic and electrical components under one roof. The products are mature, and spare parts are available at short notice all over the world. We also have extensive support from specialists who are always available, as well as support in the form of training courses, tools, and software.

How do you see your collaboration with Siemens as far as the market presentation of your company is concerned?

Rolf Mayer: Siemens is a global company, whereas we are a medium-sized firm. But both companies are brand names with a global presence that encounter customers with similar demands and expectations. But for us, Siemens is more than a component supplier. The two companies work together closely on larger projects and incorporate their respective system expertise into a superior total solution that satisfies customers.

Wilfried Rother: At the Siemens Food & Beverage Industry Competence Center we meet experienced employees with a high level of process expertise. In the field of en-
Sinamics S150: New-generation drive technology at Südzucker

At the Ochsenfurt factory of Südzucker AG, 14,500 tons of sugar beets are processed into sugar every day during the sugar campaign. Since 1986, a 6SC22-series electrical intermediate circuit converter has been in use in one of the sugar centrifuges. When Südzucker decided to introduce fundamental technology changes in 2005, the converter was still running – after 20 years – without any significant problems.

In 2000, the refined sugar centrifuge station in Ochsenfurt was modernized with three new 1750-size centrifuges and Masterdrives with AFE, which have proven their functional capability and trouble-free operation in seven campaigns now. At the same time, three identical drives were commissioned at the sister factory in Wabern.

The robust drive concept incorporating Masterdrives with AFE has been used successfully all over the world for about a decade, because trouble-free operation of the centrifuge station can be ensured with this technology even under difficult mains conditions with high voltage and frequency fluctuations.

It was the positive experience with these drives that ultimately led Südzucker to choose a new Siemens centrifuge drive with a Sinamics S150 converter. The new converter was commissioned at the Ochsenfurt sugar factory and ran the last 95 days of the campaign without any trouble. Based on the positive experience in Ochsenfurt, there is nothing to stop the worldwide use of Sinamics converters for sugar centrifuge drives in the future. Südzucker and a few other customers have since ordered centrifuge drives with the new Sinamics S150 converter. The Sinamics series therefore continues the long, successful tradition of Siemens drives in the sugar industry.

Are there any outstanding concrete examples you are thinking of in this context?

Rolf Mayer: Off the cuff, our collaboration in building the new Cumra sugar factory in 2005 is probably worth mentioning. This is an important reference project that has strengthened the partnership between the two companies.

Wilfried Rother: What particularly springs to mind is the support from Siemens in setting up our BMA Schaltanlagen GmbH subsidiary. We were able to expand our capacity in this area by more than five times, and more than double our sales in the field of electrical engineering.

How do you see the future collaboration between BMA and Siemens?

Rolf Mayer: First of all, we will be presenting our drive and control technology with hardware from Siemens and our BMA B1750 centrifuge at the Siemens booth at the Hannover Fair. We are also looking forward to other joint projects that will offer customers real added value through our combined expertise.

Dr. Mayer, Mr. Rother, thank you for speaking with us.
Process automation with Simatic PCS 7 in Russian sugar factory

Success Is Sweet

Siemens has been automating sugar refineries with Simatic PCS 7 for more than eight years. Numerous sugar factories on almost all continents have now been equipped with the efficient process control system. Last year, the first Russian sugar factory was modernized with PCS 7 and will run with drives and an automation solution from Siemens in the future. Siemens has also become a drive specialist for the centrifuges that are critical for sugar production.
Negotiations with the Russian Prodimex group were extensive and required numerous intensive meetings. At the end of the day, Siemens was able to win over the decision makers with its integrated solution based on the Simatic PCS 7 process control system as well as its long years of experience and excellent international references in the sugar industry.

Within the scope of the modernization plans for the company’s sugar factories, Prodimex also inquired about a drive solution for the sugar centrifuges. These are the heart of a sugar factory, and the right equipment with modern drive technology demands detailed technical knowledge and the ability to configure the existing drives correctly. Siemens has successfully provided both for many years, with, among others, the BMA company, one of the major suppliers of drives for sugar centrifuges on the world market. Prodimex awarded the entire contract for centrifuges to BMA, opting for the BMA drive and control concept and hardware from Siemens.

The entire solution at Prodimex now consists of a Simatic PCS 7 process control system in a client/server structure. In addition, Siemens supplied the transmitters for temperature, pressure, flow, and filling level, as well as the automatic gates and valves.

**Dynamic project targets**

Prodimex, which operates a total of 20 sugar factories in different republics in the Russian Federation, will first equip its production site in Olkovatka in Russia with Siemens technology. Originally planned as a complete solution for extensive modernization of the production plant, the modernization of the factory turned out to be a very dynamic project. Several individual subprojects were implemented first.

The focus of the first project phase was the sugarhouse, that is, the production step where the sugar is crystallized. Since this first phase of modernization was to be carried out with a later extensive automation system in mind, a client/server structure was used that could be integrated smoothly into the total system later.

The systems for clarified juice softening and sugar drying were also automated. The softening system serves to remove residue from the juice to prevent contamination of the subsequent evaporation process. Siemens supplied the PCS 7-based process automation and the field instrumentation, gates, and valves as a tailor-made solution for this part of the plant. In the course of the project, Prodimex also ordered a Siemens automation solution for the sugar drying, a step in which the remaining moisture is removed from damp crystals by heating and subsequent cooling.

**Successful first campaign**

The configuration work was completed in August 2006 with the factory acceptance test (FAT) in which the customer tested and accepted the functionality of the planned system and the visualization of the process steps. Delivery and implementation on-site began immediately after the FAT because the plant sections had to be operating at full capacity before the sugar beet harvest in the fall of 2006. Trials were run with the first sugar beets in October 2006, with great success: the first thick juice reached crystallization soon after the first production tests.

Siemens has proven with this system once again that it is always able to find the optimum solution based on sound process knowledge and close collaboration with the customer and the machine manufacturers. This project underlines Siemens’ position as a reliable and competent solution partner that can provide flexible and modular solutions for integrated systems for the automation of the sugar manufacturing process.

**Successful in the sugar industry: Siemens process instrumentation**

Siemens has been equipping factories with process instrumentation worldwide for more than 40 years. Siemens therefore also has the necessary process expertise to be able to supply both process automation and all the process instrumentation for its clients in the sugar industry.

One of the biggest projects in recent years was the modernization of the Cumra Seker sugar factory in Turkey. There, a total of 800 field instruments were installed in 2004 with a scope of tasks covering the entire process chain – from the acquisition of all the process parameters to the liquid analysis. Typical products for this process environment include Pointek level switches, flowmeters, pressure and temperature transmitters from the Sitrans family, and Sipart position controllers.

Numerous other refineries – for example, several sugar production plants in Bangladesh, the Philippines, Thailand, and Syria – have recently also begun using Siemens process instruments. More than 150 process instruments were installed at Al Thware Sugar Maskaneh in Syria alone. The largest sugar factory run by Südzucker AG, in Ropczyce in Poland, was also equipped with process instrumentation from Siemens. Following this project, the Polish sugar manufacturer Polski Cukier equipped four sites with a total of more than 500 Siemens field instruments. Siemens also gained a foothold here because of the customer’s positive experience with the Simatic PCS 7 process control system.

Find out more:

- www.siemens.com/sugar
- E-mail: bernd.langhans@siemens.com

Find out more:

- www.siemens.com/processinstrumentation
- www.siemens.com/sugar
- E-mail: marta.epure@siemens.com
- matthias.becker@siemens.com
Interview with Fernando Vicente on bioethanol market development in Brazil

Fueling Green Energy

Fernando Vicente, Industrial Director of Usina Alta Mogiana S/A from São Joaquim da Barra in Brazil, journeyed through Europe in December 2006, visiting Germany and Siemens Process Automation in Karlsruhe. We had an opportunity to meet him there and talk to him about his insights into the fast-growing Brazilian biofuels market and how Siemens is helping to sustain that growth.

Mr. Vicente, Brazil is experiencing remarkable growth in the production of biofuels, especially bioethanol. What's taking place at the moment?

Fernando Vicente: Brazil is the leader in the bioethanol market. We have the best climate, a balanced mixture of sun and rain, to produce high-quality sugarcane as the renewable resource for bioethanol. And we are in a leading cost position in the production of ethanol – which helps us maintain strong momentum in our business.

Your company produces not only ethanol, but a variety of products: sugar, alcohol, energy, and animal feed. What is the reason behind this broad portfolio?

Fernando Vicente: Well, we rent or buy the land and start harvesting sugarcane. Sugar, alcohol, energy, vinhaca – a byproduct of ethanol after fermentation – and bagasse are the final products that can be commercialized to meet changing market demands and increase our overall profitability. Using our current technology, we can switch production at a moment’s notice from energy to sugar to alcohol and vice versa. We sell all of these products or use the energy in the plant itself. In general, 75 to 80 percent of Brazilian electrical power comes from hydropower and only 1 to 2 percent from biofuels. That will change in the future, and by 2010, up to 6 percent will be from biomass energy due to less-frequent rainfall and the need to produce “just in time” electricity to satisfy consumption demands.

How is Siemens helping you to increase efficiency and optimize production?

Fernando Vicente: Some people opt for the simple approach involving little or no automation. Others, including myself, go for high technology in the automation process to guarantee high process quality and less deviation, for instance, with standard components, automation, valves, and drives.

Essentially, we have been looking for performance and an all-embracing solution with innovative, sustainable technologies and, what is perhaps most important, the right partner. Siemens offers an all-inclusive solution covering all aspects of production: from weighing the incoming raw material to production control via the excellent process automation system, a comprehensive range of power generation and power distribution components to purity measurements with process instruments and analytical devices. One focus we have is on operational safety. This requires significant process transparency, and Siemens automation systems provide that.

In our newest plant, Santo Inacio, which will be the most modern plant in Brazil, we decided to install everything from Siemens: drives, panels for energy distribution, centrifuges, relays, TIA, and TIP.

Via the Profibus communication capability, data and information will be displayed directly in the control room, enabling all equipment to communicate. Drive and motor positioning will also be handled remotely.
Usina Alta Mogiana: A leader in bioethanol

Usina Alta Mogiana S/A is one of the leading bioethanol/biofuels producers in Brazil with about 10,000 employees working in the cities of São Joaquim da Barra; Presidente Prudente (SP); and Colorado. A fourth unit is under construction at Santo Inacio. With an annual output of 4 million tons, the new plant in Santo Inacio will feature Siemens TIA (Totally Integrated Automation) and TIP (Totally Integrated Power) technology, automated with Simatic PCS 7 and equipped with Siemens medium- and low-voltage components.

What are the requirements for a partner, such as Siemens, who adds both short-term operational performance and long-term plant value?

Fernando Vicente: Siemens equipment and systems deliver excellent quality. Durable drives, energy solutions, and automation systems all come to mind. Our Simovert-driven centrifuges, for example, have never given us even the smallest problem. Moreover, Siemens offers a solution for all our requirements. We get support in finding the right balance between alcohol production, steam consumption, and selling the electrical energy. This gives us greater flexibility with regard to market prices.

Long-term reliability is another important factor. Crop rotation is five years for sugarcane and six years for beans. Siemens has been in Brazil for a long time, and we believe that Siemens will stay in Brazil – there is no risk with such a partner.

What does the future hold?

Fernando Vicente: With ethanol, the next three to five years promise an excellent outlook due to flex-fuel cars and an overall increase in production. We can also sell more electricity. The agro business started in 1980, and many other industries profit from it, including plant construction and plant engineering. This industry has power and impact on other industries. The quality of sugar-cane will change and improve as the agro centers develop new varieties with higher sugar contents and less bagasse. Energy consumption and consumer behavior will determine demand here. We believe that agro business helps people stay in small cities and withstand the negative effects of urbanization by enhancing the quality of life, improving working conditions, and fostering a healthy environment. And because Siemens technology is also helping educate our staff to provide the benefits of agro business and biofuels faster and more efficiently and in greater quantities for everyone’s benefit, Siemens automation is, in effect, making a significant contribution to a better way of life in Brazil.

Find out more:
www.siemens.com/chemicals
www.siemens.com/bioethanol
E-mail: chemicals@siemens.com
Integration of nonintelligent components in close-to-machine asset management systems

Closing the Information Gap

Modern plant asset management systems play a vital role in increasing plant availability. However, the components that are most frequently responsible for failures often do not provide the information necessary for early detection of problems. This information gap can now be closed with an intelligent evaluation of existing process information.

Plant asset management systems receive information from process components and evaluate the data to provide the plant owner with an overview of the operating status of the plant's assets. The main benefit of asset management in the process industry is in proactive maintenance and repair. Based on information such as operating hours or with the aid of special diagnostic devices, the actual stress and wear factor of the systems can be determined.

However, asset management has its limits – for example, when mechanical nonintelligent components are to be integrated. Diagnostic devices can be retrofitted, but such systems are relatively expensive and cannot be used consistently on all mechanical assets. It is components such as pumps and heat exchangers that often lead to unplanned plant downtimes, as they are subject to mechanical stress. In many cases, an alternative to specific retrofitting with monitoring devices can be to use the existing process information intelligently. The data can be managed by special software components so that they can be displayed...
station of the process control system. The central component for this is called AssetMon. It contains electronic descriptions of the respective assets, triggers maintenance alarms, and supplies information for visualization in the maintenance station.

Focus on heat exchangers

Heat exchangers are another type of mechanical component that frequently requires maintenance and are insufficiently monitored by asset management systems. The main problem with heat exchangers is fouling: the buildup of deposits on the heat-exchange surfaces, which impairs efficiency. Since maintenance work on heat exchangers usually requires a complete shutdown of the plant, it is a great advantage to know the progress of the fouling process and to be able to plan the necessary maintenance work well in advance. For this, data can be accessed that are processed in a real plant by the process control system but have not previously been used in the context of an efficiency calculation: flow temperatures at the infeed and outlet as well as the respective flow rates.

Reliable forecasting of the fouling process under real plant conditions, however, demands the solving of complicated equations with the help of an arithmetic component. These demanding calculations are therefore carried out in the so-called calculation engine on a component remote from the process. All the data from the individual measuring points necessary for the calculation are provided by a coupling component connected to the calculation engine. An AssetMon component with the corresponding EDD (electronic device description) assigned to the heat exchanger serves as a representative for the mechanical asset, as for the radial pump.

Solid results

These two examples show how the mechanical components of a production system can be integrated into the asset management system. In this way the user is constantly supplied with diagnostic data from the continuous determination of the state of the plant components, allowing status-based preventive maintenance. An early warning system for faults can be implemented reliably and without much extra effort today. In the future, the current “wear factor” and an estimation of the probable remaining life of the pump will be visualized in the system. The infrastructure and logic for this have already been created; now we are waiting for feedback from users, whose experience will form the basis for further developments.
To supply its customers with both large batches and customized small batches, Sto AG – the world market leader in the facade insulation systems sector and one of the most innovative manufacturers of facade elements, plasters, and paints – developed completely new production structures and capacities at its headquarters in Stühlingen, Germany. Designed for large batches between 2 and 2.5 metric tons, the silo tower is more than 50 meters high and transfers materials and intermediates from the silos in the top of the tower down through various process stages such as weighing, mixing, and filling. In the so-called service factory, the process is primarily horizontal, and amounts from 2.5 kilograms to 2 tons are proportioned, filled, mixed in the bucket, and delivered very quickly on a just-in-time basis.

High-end controllers at the heart of the concept

As general contractor, the Austrian company Doubrava GmbH & Co. KG was responsible for planning and implementing the industrial outfitting of the factory. An experienced partner of Sto in this sector, RK Prozesstechnik GmbH & Co. KG from nearby Lauchringen, was contracted for the automation engineering design and equipment connection. Switches are used to link the automation level to the higher-order plant instrumentation and control system, in which more than 100 individual automation components and the function phases required for the processing of close to 1,500 product recipes are drawn up, managed, and forwarded to the master controllers in the central control room over an Industrial Ether-
net network. From here, visualization and batch servers supply diverse clients in the factory. A CO₂ extinguishing system; an uninterruptible power supply for controllers, servers, and switches; and partial redundancy in the form of cold standby computers underscore the high demands of the operator on plant availability in this area.

At the heart of the production facility are four Simatic S7-400 controllers, which essentially split the tasks of dry loading the silos, dry proportioning from the silos, liquid loading the tanks, and liquid proportioning of pastes, binders, and additives from the tanks, and then share the mixing. In total, RK Prozesstechnik installed around 250 Simatic ET 200 distributed I/O stations on several floors. Along with proportional valves, valve islands, frequency converters, Siwarex weighing modules, and Simatic operator panels in the field, these systems are linked via Profibus DP, while the measuring technology communicates with the control center over a separate dedicated Profibus PA line.

In order for the function phases, which can comprise as many as 22,000 data points, to be transferred in as little time as possible from the plant management level to the controllers and be processed, Sto employs the Simatic CPU 417-4, currently the CPU with the highest performance, and today’s most powerful CPU 443-1 Advanced communications processor from the Simatic Net product portfolio. “This combination,” says the head of electrical planning at Sto, Heinrich Studinger, “has resulted in a significant reduction in communication time as well as cycle times, which of course adds up in plants that run three shifts and results in maximum productivity.” The proportioned amounts, including dribbling, cumulative scale values, and any instances of operator intervention, are forwarded to the plant management level and archived. This makes it possible to completely reproduce the composition of each individual batch even years later.

Workflow automated throughout the system

The plasters and paints are transferred from the mixers either automatically, in buckets, or manually, using a swivel-mounted filling hose, into large containers on special stacker trucks for weighing, labeling, and palletizing. A modular control concept based on Simatic was also implemented for these tasks, which are downstream of process engineering and more production-related. Unstacking the buckets, filling, and labeling are controlled by Simatic S7-400 controllers, while a Simatic S7-300 is used to control palletizing. Another Simatic S7-400 controls the transport of the full pallets from the mixing lines to the high-bay warehouse and communicates with the line controllers over a Profibus DP-DP coupler. Using the portable Simatic 170 Mobile Panels, the operators enjoy freedom of movement along the transport path that offers several connection boxes. The panels can be plugged into and unplugged from the Profibus line during operation and have a 10-meter flexible cable.

In the service factory, all central and distributed control cabinets contain controllers, weighing modules, operator panels, and, in some cases, drive technology from Siemens as well: Micromaster 440 series converters, intelligent Simodrive 611s, and a Simatic S7-300 controller.

Unbeatable reliability and availability

Automation technology from Siemens thus contributes on all levels of the factory toward ensuring that Sto products are of the highest quality over the long term. “In the PLC sector, our delivery specifications have called exclusively for components from Siemens since 1989,” says Studinger, “because their reliability and availability are simply unbeatable.”

Find out more:
www.siemens.com/chemicals
E-mail: chemicals@siemens.com
CASE STUDY

HeidelbergCement is one of the world’s leading manufacturers of cement, concrete, and building materials. With approximately 42,000 employees and more than 1,600 production plants in 50 countries, the corporate group is the world’s fourth-largest and Europe’s third-largest cement producer. In January 2004, the HeidelbergCement companies CBR in Belgium and ENCI in the Netherlands were merged into a new organization by the name of CemBeNe. This merger provided the opportunity not only to streamline the corporate structures but to make large information technology (IT) investments to automate and further optimize the production processes. It soon became clear that a critical step toward increasing production capacity would be to considerably improve system transparency. Therefore CemBeNe looked for a suitable solution for the acquisition and processing of process data, which would allow the company to better assess and optimize the cost-effectiveness of its production.

Integrated solution

Most of the CemBeNe plants operate with the Cemat process control system, which is based on Simatic PCS 7 and developed...
Specifically for the cement industry. It was therefore expedient to use the capacities of this system and the Siemens expertise behind it to develop a consistent TIA solution with MES functionality – a task for which CemBeNe tapped the experience and industry knowledge of Simatic IT certified partner Technord Automation. After extensive analyses, CemBeNe chose the Simatic IT solution package. Simatic IT offers a high degree of uniformity, which not only significantly reduces the development and implementation time but also enables smooth integration with Simatic PCS 7. Since this is an open environment based on recognized standards, the integration of common management information systems (MIS) and enterprise resource planning (ERP) solutions poses no problems either.

Requirements and solution

The corporate strategy of HeidelbergCement includes optimized production processes and long-term profitability of production – a demand that at CemBeNe was to be met above all by continuous acquisition and archiving of all operating data. All the data on processes, resources, raw materials, and end products were to be entered and placed in relation to the operating data of the furnace. This information was then to flow into an MIS, which would make process performance and cost structures transparent and enable continuous monitoring of the strain on the environment.

The solution implemented by Technord Automation is smoothly integrated into the existing system environment. It connects the company-wide ERP solution at the corporate level with the Cemat automation system at the process level and the linked laboratory information system (LIS). The decisive advantage here is that reports no longer need to be written by hand with great effort and considerable delay, but can now be generated directly from the current database automatically.

Implementation in three steps

The first project phase was a pilot installation for the coal mill at the Belgian site in Lixhe, in which the possibilities of long-term data archiving and the advantages of KPI (key performance indicator) calculation were to be demonstrated. In addition, this phase was to allow the company to set up an extensive performance reporting system.

Implementation of Simatic IT at the Belgian sites in Lixhe and Anoing followed in the second phase. In the third phase, the project was transferred to the sites in the Netherlands.

Thanks to Simatic IT and the integration of the management and process levels with TIA, important information such as energy consumption, use of operating equipment, downtime, and production yield is available all the time on demand and is visualized in user-specific reports and views. CemBeNe is therefore able to make direct KPI calculations based on the latest data, and all production processes are transparent.

Find out more:
www.siemens.com/cement
www.siemens.com/simatic-it
E-mail: cement_industry.simatic-it@siemens.com
Totally Integrated Automation adds value in every phase of the plant life cycle

In today’s collaborative business environment, plant managers always face competitive pressure. They need to improve product quality and plant throughput while keeping an eye on overall costs. Siemens supports its customers with integrated solutions that guarantee a smooth flow of information and save valuable resources throughout the system’s life cycle.

Detailed process knowledge is the key to improving cost structures. The transparency and visibility of information ensures well-informed decision making and helps optimize process control to reduce costs and increase productivity. The prerequisite for this is an intelligent and closely networked automation and information technology (IT) infrastructure that transforms process data into useful information.

This is exactly the thought behind the Siemens concepts of Totally Integrated Automation (TIA) and Totally Integrated Power (TIP). They are based on smooth integration between the hardware and software components, which ensures that the processes always stay transparent and information is available at all corporate levels.

Modular approach to tailor-made solutions

With TIA and TIP, Siemens meets all the requirements for the entire life cycle of a production system, from design and engineering to operation and maintenance to modernization or decommissioning. Sophisticated configuration and simulation tools speed up project implementation and create all the necessary conditions for maximum system availability.

The Simatic PCS 7 process control system not only offers optimum capabilities for implementing a tailor-made TIA solution but also supports efficient project implementation through the close integration of engineering systems with tools for application development and the configuration of the process control system. With its graphical user interface, PCS 7 enables easy visualization of the processes, and its intuitive operation ensures reliable process control. This environment helps effectively implement the process automation concepts and enable faster integration of field devices into the engineering phase. The numerous libraries and templates simplify configuration and relieve users of many routine jobs. The systemwide, life cycle oriented solution of TIA and PCS 7 brings advantages to every automation task and ensures the smooth, effective integration of existing systems and IT solutions. At the same time, PCS 7 incorporates a good basis for efficient asset management.

Cost structures play a key role in becoming and staying successful in the chemical industry

\[\text{Koeppel photoDesign}\]
Simulation replaces trial and error

Traditionally, automation solutions have been designed on a workstation and thoroughly tested. Further tests must be carried out on-site and the applications adapted to the process environment if necessary. This fine-tuning ties up valuable resources. It is quite time-consuming and often necessitates fundamental changes at the last minute.

To make testing easier, Siemens relies on state-of-the-art simulation techniques that enable processes to be completely simulated on the computer and local adaptations to be limited to an absolute minimum. Two examples of this are the simulation tools Simbapro and Simit. Simbapro simulates on an I/O level, including units such as pumps, valves, and so on. I/O modules are modeled by PC software, thus avoiding time- and cost-intensive procedures to build up hardware structures. Simit provides simulation on an I/O level and functions like Simbapro and additionally enables the simulation of complete process behavior. The software package contains the “Flow Net” library, providing the capability to model the behavior of pipes, tanks, and other equipment. Thus it is the tool for realistic operator training.

Both simulation tools simplify application module testing and – importantly – the factory acceptance test (FAT).

Transparent processes due to data availability

Siemens automation solutions are developed with system openness in mind and are based on established industry standards. The communication between the control system and the field devices takes place via Profibus. The networking of the process control system and the master ERP systems uses Industrial Ethernet. This enables the many different systems, solutions, and devices to be integrated without having to program proprietary interfaces first, and creates an integrated total system that extends from the management to the field level. It offers an optimum platform for making processes visible, identifying bottlenecks, and ensuring the long-term availability of the entire plant.

Safety and reliability

While open and standardized network technologies have many benefits, at the same time they hold a certain risk of attacks, from outside and particularly from inside the company. One of the key issues for equipment and system manufacturers is therefore ensuring the reliable protection of process automation systems.

Siemens system security consists of a variety of products, concepts, and measures that are embedded in a uniform concept that is adapted to the special requirements of the respective system. The extensive product portfolio certified for use in different industries includes passive network components, switches, wireless technology, and software with security features.

This product range is supplemented by extensive support for the design and operation of communication networks. This includes network planning, administration, and consulting for the implementation of security patches and updates.

The offering is rounded off by consulting services relating to the application of security functions such as firewalls and encryption techniques, as well as the identification and documentation of existing risks and the performance of audits. In this way, integrated network structures are created that, thanks to a sophisticated security concept, meet all the requirements for network security without hindering the free flow of information that is indispensable for process monitoring and control.

Knowledge and experience as a basis for greater efficiency

With this solution portfolio and its wealth of experience in the industry, Siemens offers a range of services that go far beyond mere production control. This creates optimum conditions for total solutions that address the entire life cycle of the system and provide an efficient production environment in every way.

Find out more:

www.siemens.com/chemicals

E-mail: chemicals@siemens.com
Weighing Technology

CASE STUDY

Siwarex FTA as a calibratable weighing system for weighing green coffee

Integrated Versatility

With the versatile, calibratable Siwarex FTA weighing electronics, various weighing tasks can be performed safely and reliably with just one device. Getreide Terminal Hamburg (Hamburg Grain Terminal) is benefiting from the advantages of the weighing system, which is integrated smoothly into the automation systems of the Simatic line. Siwarex FTA enables the fully automatic weighing of green coffee in a new transshipment scale.

The Getreide Terminal Hamburg (G.T.H.) grain terminal handles not only the shipping and weighing of oilseeds and grain but also green coffee. In order to introduce a state-of-the-art weighing system for green coffee, the company commissioned a new transshipment scale that can weigh twice as much green coffee per hour than the mechanical system previously used. This increases the hourly throughput from 60 to 120 tons of green coffee. In addition to being able to calibrate the scale, one point was particularly important to G.T.H.: the new weighing system had to be integrated into the control tech-

Hamburg Grain Terminal

Getreide Terminal Hamburg GmbH & Co. KG is one of the leading German seaport transshipment and storage companies for agricultural products. With more than 255,000 tons of storage capacity, the transshipment plant has the largest storage capacity for agricultural products in the Hamburg harbor. In addition to the traditional key business of grain and oilseeds, the company has since 1994 built up a second line of business with the transshipment and storage of green coffee in silo cells.
nology because the company wants to install a central, systemwide computer system for all transshipment scales.

The bulk scale for free-flowing products has a useful load of 600 kilograms and operates up to 32 different silo cells. The weighing system, which combines the proven Vollenda mechanics with the Siwarex FTA electronic weighing module from Siemens, is mainly used for weighing green coffee stored in silo cells. It has been designed to be able to continue using the existing connections for material feed and discharge and the coffee-cleaning system at the silo level.

Measuring, communicating, documenting weights

Schultze Anlagentechnik, which specializes in technical services for the building and maintenance of customized systems in the Hamburg harbor, planned and implemented the project. The Siwarex FTA weighing module is configured as an automatic totaling scale for loading and unloading in accordance with OIML R107. It doses the total amount into individual portions of 600 kilograms. The electronics document every single weighing of the officially calibrated scale on the module’s memory card. The sum is formed at the end and the total volume calculated.

Automatic scales are active modules that not only acquire the data but also perform control tasks. With the appropriate parameterization, the scale monitors filling processes independently of the controller and responds to certain events such as reaching the nominal value. The user can preset filling volumes, specifying accuracy and tolerances as well as various other parameters such as the size of the container or the coarse and fine switch-off point, and adapt the system to the user’s individual requirements and the goods to be weighed. For example, weighing at G.T.H. needs to accommodate for the specific weights of different coffee types. Such tailor-made weighing processes help achieve very precise filling and proportioning in a very short time.

Consistently networked

Schultze Anlagentechnik developed special loading software for the new weighing system, with which the complete goods transshipment can be monitored, visualized, and archived electronically. All weighing data are therefore available to personnel on every computer over the local network.

Peter Schultze, managing director of Schultze Anlagentechnik, has maintained the existing Simatic systems at G.T.H. for many years. He took the modernization of the transshipment scale as an opportunity to study the Siemens weighing technology. Peter Schultze is particularly impressed by the efficiency of the electronics – not only as far as the actual weighing functions are concerned (that is, the acquisition of weighing data), but also the control functions that the modules can perform. In addition he admires the openness and easy integration possibilities of the system: “The advantage of the Siwarex technology, for one thing, is that it can be integrated as a function module into the control technology of the Simatic S7 family. Other solutions require more expensive bus connections and therefore a much greater integration effort.”

Additional projects planned

Owing to the positive experience with the first project, G.T.H. intends to systematically replace other mechanical counting systems with automatic weighing systems. Schultze Anlagentechnik is currently converting three other scales that are used at the terminal for transshipping grain from silos to ships. The aim is to install a central, systemwide computer system. The scale manufacturer, Vollenda, is also impressed by the advantages of automating scales with Siwarex FTA and has declared that it will be offering this solution as a priority in the future.

Siwarex FTA

Siwarex FTA is a calibratable and versatile weighing-electronics system for Simatic S7, C7, and PCS 7. By setting a parameter in Siwarex FTA, one of the following scale types can be activated:

- NAWI (nonautomatic weighing instrument) conforming with OIML R76
- AWI (automatic gravimetric filling instrument) conforming with OIML R61
- Automatic catchweighing instrument conforming with OIML R51
- Discontinuous totalizing automatic weighing instrument conforming with OIML R107

In the transshipment scale at Hamburg Grain Terminal, Siwarex FTA enables the fully automatic weighing of green coffee and therefore contributes to a greater transshipment capacity.

Find out more:

www.siemens.com/siwarex
E-mail: thomas.konow@siemens.com
GEA Lyophil offers a complete line of high-quality products associated with all aspects of aseptic manufacturing, as well as integrated solutions and efficient service for the pharmaceutical, healthcare, and biotech industries. GEA Lyophil’s scope of supplies and services covers all project activities from conceptual design and engineering to assembly and commissioning, including IQ/OQ and SAT. Freeze-drying solutions from GEA Lyophil also include insulator systems that are sterilized with vaporized hydrogen peroxide. This sterilization method operates at room temperature, thus reducing the stress caused by pressure and temperature changes. In 2005, GEA Lyophil developed and patented a new vacuum version of these devices for freeze dryers under the name Vapovac. GEA Lyophil is the only manufacturer that offers this technology, which is faster, safer, more efficient, and more environmentally friendly than using steam.

Three versions for new units and retrofits
GEA Lyophil supplies the Vapovac sterilizer in an integrated version, which is delivered together with a new freeze dryer, as well as two retrofit versions for equipping existing systems.
Plants. Audit trail functions and the possibility of versioning projects support effective engineering of the HMI solution. The WinCC flexible PM Quality add-on provides a modular, industry-neutral archive system for the batch-related acquisition of process and production data based on the specifications for plants in validation environments.

First units already in operation
GEA Lyophil is also very pleased with the Siemens software in the new application, which has even surpassed expectations in some ways. The company particularly appreciates the fact that highly qualified contacts were always available at Siemens to provide help at short notice. GEA Lyophil’s customers benefit from rapid configuration and are able to use modern, convenient applications that are easy to operate and maintain. Customers are already asking for the retrofit version in addition to the integrated version, which has been developed and tested in the last few months.

Consistent platform for all tasks
For the automation of the sterilizers, the company was able to use the experience that GEA Lyophil had gained in the visualization of its new freeze-drying systems with the FDA-compliant Simatic WinCC flexible HMI platform. WinCC flexible is an integral part of the Simatic software family and supports the advantages and possibilities of a Totally Integrated Automation solution as well as consistent GAMP 4 and FDA compliant operation of the machines and plants. Audit trail functions and the possibility of versioning projects support effective engineering of the HMI solution. The WinCC flexible PM Quality add-on provides a modular, industry-neutral archive system for the batch-related acquisition of process and production data based on the specifications for plants in validation environments.

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Find out more:
www.siemens.com/pharma
www.gea-lyophil.de
E-mail:
Hans-Peter.Rahmacher@gea-lyophil.com
The Leading Infusion Factory Europe, or LIFE for short, is the largest factory for manufacturing infusion solutions in Europe.

Totally Integrated Automation at B. Braun in Melsungen

Production Facility of the Future

In Melsungen, Germany, B. Braun recently began operating the most modern production site for parenteral solutions in Europe. With highly efficient production machines and a very high degree of automation, the system operates extremely economically. One of the key components of the production facility is the package unit controller, which Siemens has automated with Simatic PCS 7.
B. Braun is delivering innovative healthcare products, services, and educational programs for healthcare professionals in the fields of drug delivery, intravenous therapy, pain control, clinical nutrition, dialysis, and vascular intervention. One of the four divisions of B. Braun is the Hospital Care Division, which supplies hospitals with parenteral and intravenous solutions as well as single-use medical products.

Because the existing production facilities for parenteral solutions had reached their capacity limits, B. Braun decided to build a new production site. After extensive location analysis the company chose Melsungen in Germany as the site for the new facility – in part because the expertise needed for the installation and operation of the highly modern production facility was readily available and the employees had the necessary qualifications. With state-of-the-art production technology and a high degree of automation and networking, B. Braun is ready to face growing price pressures, especially for standard parenteral solutions, and at the same time to set new standards in product safety and regulatory compliance.

Unique integration
The cornerstone for the LIFE (Leading Infusion Factory Europe) project was laid in 2002. LIFE is the largest factory for the manufacture of infusion solutions in Europe. It consists of three lines that produce parenteral solutions in containers of 100, 500, or 1,000 milliliters in a fixed line assignment.

The package unit controller, which coordinates the units, was planned by Lang + Peitler in accordance with US Food and Drug Administration (FDA) regulations. All the units were networked with each other and with the master management systems. Frank Hähner, project manager at B. Braun, underlines the advantages: “The networking of information management and the production process allows us to react quickly to the order situation. In addition, the consistent electronic production recording will save us 300,000 pages of paper printouts a year.”

Networking machines, recording data
One of LIFE’s central production units is the section for filling, sterilizing, and packing the parenteral solutions. The approximately 70 different machines and package units in this section were delivered by 10 different manufacturers. The package unit controller (PUC) coordinates the units and forms the interface between the master manufacturing execution system (MES) and the individual units.

Siemens supplied the entire process control technology concept, based on Simatic PCS7, and implemented the new control system for the PUC part of the project. Siemens also took on the software engineering, the construction of the switch cabinets, and the installation of the PCS7 system technology, as well as the commissioning of the systems and creation of the qualification documents. This integrated total solution for the PUC was one of the key points in Siemens’ favor, along with the company’s experience in the pharmaceutical industry. In addition, B. Braun had already worked well with Siemens on other projects.

Expertise close to the customer
Almost a year has passed since the beginning of production in Melsungen. B. Braun is very pleased with the performance of the PUC and is continuing the partnership with Siemens in Melsungen. The Siemens team in Marburg is responsible for after-sales service.

Find out more:
www.siemens.com/pharma
E-mail: ruediger.sebastian@siemens.com

Leading in Europe: L.I.F.E.
The LIFE factory of B. Braun Melsungen AG is a cutting-edge production site. The facility houses all the production steps from the weighing of the raw materials to the packing of the finished product on pallets. The distillation plant for manufacturing water for injection (WFI) and pure steam is one of the largest of its kind worldwide.

The solutions are packaged in oval Ecoflac plus containers. These polyethylene containers are as stable as glass bottles when filled, and pull together as a result of the vacuum produced when used. In a so-called blow-fill-seal (BFS) process, the bottles are manufactured, filled, and sealed in a closed process directly in the factory.

The system, which has been designed in accordance with the latest EU GAMP 4 and FDA regulations, is distinguished by the greatest degree of automation ever achieved in a pharmaceutical production facility. B. Braun is convinced that this was the only way to manage the production of its parenteral solutions in a country with as high labor costs as Germany.

Simatic PCS 7 in Melsungen
- 3 redundant PCS 7 server pairs
- 3 MIS Light servers for archiving and logging
- 1 SQL server for the interface to the MES
The story of the Simmering plant began in June 2004, when three companies, Wienstrom GmbH, Fernwärme Wien GmbH, and Österreichische Bundesforste Beteiligungs GmbH, established a joint venture for building and operating the biomass-fueled power station. Each company holds one-third of the shares. The power plant is fueled exclusively by native wood chips supplied by Österreichische Bundesforste. The operation of the Simmering biomass power station results in a carbon dioxide emissions reduction of 144,000 tons per year. Siemens supplied and installed not only the entire power generation unit but also all the analytics for emission measurement, thus ensuring that Simmering is a role model for avoiding excessive nitrogen oxide and carbon monoxide emissions.

With the Simmering biomass power station, Austria takes a big step toward achieving the greenhouse gas emission-reduction goals established in the Kyoto treaty. The power station, fueled by wood chips from Österreichische Bundesforste (Austrian Forestries), will reduce the production of carbon dioxide by about 144,000 tons per year. Siemens supplied and installed not only the entire power generation unit but also all the analytics for emission measurement, thus ensuring that Simmering is a role model for avoiding excessive nitrogen oxide and carbon monoxide emissions.

General contractor Siemens
With a steam generation unit with fluidized bed technology from Foster Wheeler, Siemens emerged as the successful bidder from the EU-wide invitation to tender for the technical implementation. As the general contractor, Siemens installed the new power generation unit with an output of 37.0 megawatts for district heating and 24.5 megawatts for electricity.

In addition, Siemens was also responsible for the entire emission monitoring system. The emission monitoring technology is installed in a fully air-conditioned container directly next to the stack. It is equipped...
with the complete control technology, the signal conditioning and transmission in the electrical part, and the physical analytic systems in a rack: an Oxymat 6 for oxygen detection; a Fidamat 6 for determining the total hydrocarbons; an Ultramat 6 for determining carbon monoxide, nitrogen oxide, and carbon dioxide; and an LDS 6 for the in situ analytics of the flue gases. The sample conditioning is also accommodated in the container.

**Integrated emission monitoring**

Approximately one liter of gas per minute is fed through the appropriate analytical circuit. The measured values are then preprocessed by Simatic ET 200 I/O units and fed into an optical Profinet network, with the appropriate interface components and optocoupling units, which transmits them to the server room and the central control room.

The reference gases for calibration are also placed in or directly next to the container. The systems must undergo calibration every seven days. The measuring signals are fed to the central control room by fiber-optic cables, allowing early action to be taken in the case of recognizable trends toward the limit values. “Our emission limits not only comply with legal specifications; they are also well below the threshold values. We have applied for approval of the system with about half the permissible limits,” explains Rudolf Schwarzböck, deputy head of the production division at Wienstrom and the one responsible for the biomass power station project.

From the information provided by the emission monitoring system and other lead parameters such as power draw-off and process and boiler feed temperatures, the system operator receives a detailed picture of the plant and can react appropriately if a limit is reached – for example, by adding suitable catalysts.

**Highly available and absolutely reliable**

In all the years of working with Siemens on emission monitoring in all power station units operated by Wienstrom, there have never been any complaints from the authorities, according to Rudolf Schwarzböck. Siemens guarantees a standby call time of two hours and an availability of the measuring systems of 95 percent for all emission monitoring systems at Wienstrom.

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**LDS 6: In-line analytics with multiple application options**

The LDS 6 laser diode spectrometer for in situ process gas analysis is based on a noncontact, spectroscopic measuring principle. It measures individual components of gas mixtures directly in the process gas stream – precisely and in seconds – without taking samples or sample conditioning. This also applies in the case of high dust loads and temperatures or corrosive process gas. The entire system is particularly suitable for applications in harsh process conditions. The spectrometer is self-calibrating and uses extremely robust process sensors.

The process sensors are by default equipped with pressure-proof stainless steel flanges and windows for measuring oxygen in chemical processes at a high gas pressure (up to 5 bar) in line. Borosilicate windows in dimensions of DN65/PN6, DN80/PN16, or ANSI 4 inch/150 pounds are available. The LDS 6 also measures trace moisture in highly corrosive media such as chlorine gas directly in the gas stream, within seconds and without hysteresis, and with excellent long-term stability and low maintenance. This is an important advantage over conventional methods with susceptible and relatively sluggish electrochemical P205 sensors.

For applications in steel production, the LDS 6 measures the gas concentration of carbon monoxide and dioxide in the same measurement volumes simultaneously, directly in the process gas. The spectrometer provides these values in seconds, without any delays due to taking and preparing samples, and therefore allows efficient control.

The high maintenance effort required for the extractive gas analysis that used to be the norm is no longer necessary in any of the applications.

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**Find out more:**

www.siemens.com/processanalytics
E-mail: barbara.petzl@siemens.com
Decoupling of position controller and sensor enables application in difficult conditions

No More Feedback

The compression of industrial gases can lead to intensive vibrations in the pipes, which can spread to the positioning valves and have a massive influence on their long-term functioning. By combining the Sipart PS2 positioner with a magnetically coupled noncontacting sensor, this problem can be successfully mitigated.
Siemens Automation Summit 2007

The 2007 Siemens Automation Summit will bring together manufacturing professionals from virtually every discipline and background at an exceptional conference held at Disney’s Coronado Springs Resort, Florida from June 12 to 15, 2007. The theme of this year’s event is “Automation, Innovation, Inspiration.”: unleashing the competitive business advantage with automation, optimizing manufacturing through advanced technology with innovation, and stimulating new ideas with inspiration through best-practice sharing, education, and networking.

The summit will showcase a technology exhibit with the product experts in a hands-on environment, breakout sessions for in-depth discovery of Siemens product roadmaps, strategies, targeted training, and best practices, as well as hands-on product training sessions with the leading experts. Participants will have the opportunity to network with Siemens management and executives and meet with authorized Siemens Solution Partners. Customer Excellence Awards will honor Siemens customers who have used Siemens technology to build business success.

Register today:

www.sea.siemens.com/summit

For more information, you can also contact Catherine Derkosh: catherine.derkosh@siemens.com

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