Beck & Co. put their trust in Braumat

MES solutions ensure economic performance and quality

Innovative automation solution at Südzucker

PCS 7 Builds Up Steam
Using innovative and powerful IT concepts, companies in the food and beverage industry can optimize their processes. Moreover, IT systems like Simatic IT are indispensable for tracking production processes. Component reliability is the key issue in the sugar industry – and that was why Südzucker chose failsafe automation systems made by Siemens and the PCS7 process control system. The Orange Sky is one of the first ships to store and transport liquid orange juice. Siemens Global Support contributed to the success of this multi-national project.
Dear readers,
humans do not live by bread alone. Consumers in our time make many demands on what they eat and drink. Naturally, they want food and beverages that taste good and that are healthful. At the same time, people want a balanced diet and wish to buy products adapted to their individual expectations – all this, of course, at a reasonable price.

This means that companies in the food and beverage industry not only need to optimize their processes under the aspect of cost effectiveness but also need to be flexible in producing a wide range of individual products. At the same time, the number of foodstuffs enriched by health-conducive additives, which therefore need to be produced under conditions similar to those in the pharmaceutical industry, is growing. In addition, the demand for greater transparency is becoming increasingly important – for reasons of product liability on the one hand and to make production more effective and economical on the other. High-performance, integrated IT and automation systems are central instruments for introducing this transparency.

For more than 30 years, Siemens has accommodated its customers in the food and beverage industry with tailor-made products, systems, and solutions. In this issue, we show you some of the latest examples of this cooperation and demonstrate how companies from so many different fields, such as the sugar, brewing, or soft drinks industries, have achieved their goals using our systems and solutions. These success stories are an incentive for us to increase our range even further – for example, by developing new technologies in field devices or by expanding our IT portfolio.

We will also remain a reliable and competent partner who will face the challenges of the future at your side. Here’s to a good partnership!

Gerd Trummer
Siemens Automation and Drives
Competence Center Food and Beverage
Bayer and Siemens Sign Global Skeleton Supply and Service Agreement

At this year’s Achema, Bayer AG and Siemens signed a global Skeleton Supply and Service Agreement, which concerns the worldwide supply to Bayer production plants of Siemens Sitrans P pressure transmitters. The contract runs for four years. The agreement was reached based on the good results of thorough tests of the Sitrans P DS III pressure transmitter, which has been in operation as a standard field device at Bayer AG since November 2001.

In addition to the high technical competence and the global presence of Siemens, especially in the Asian market, it was the excellent worldwide Siemens support that tipped the balance in favor of signing the agreement.

The contract supports the efforts of Bayer AG to pursue further standardization in equipping its plants. In order to achieve this goal, Bayer needs reliable partners such as Siemens and is therefore very keen on further cooperation – also in the field of process control systems, according to Dr. Klaus Schäfer, senior vice president of Bayer Polymer Technology.

In addition to Bayer Polymers, the other three Bayer divisions – Chemicals, Healthcare, and Crop Science – will also be able to benefit from the agreement.

Dr. Klaus Schäfer of Bayer (right) and Hans-Georg Kumpfmüller of Siemens (left) close the deal at this year’s Achema

Fairs and Events for the Food and Beverages Industry

On September 17 and 18, 2003, the faculty for Information Technology in Mechanical Engineering at the Technical University of Munich will be holding its second symposium on the topic of Information Technology in Food Production. Together with well-known manufacturers of automation and IT solutions, the faculty has assembled an interesting program dealing with plant planning, process automation, and production logistics.

The first day of the symposium concentrates on the visions of leading companies and research institutes regarding questions of automation, packing, logistics, and quality assurance. On the second day, users from the sugar, delicatessen, dairy, beverages, and meat industries report on how IT solutions are helping them to meet their requirements.

The event closes with a podium discussion under the motto “Quo vadis, food and beverages industry” focusing on automation, globalization, and market and health aspects.

In November, there are two important dates to note in your diaries: Brau 2003, from November 12 to 14 in Nuremberg, and Tabexpo, the world’s most important fair for the tobacco industry, from November 25 to 28 in Barcelona.

Simatic WinCC V6.0: New FDA Options

Extensive new functionality has been added to the new Simatic WinCC Version 6.0, giving users even greater support than before in the validation of their plants in accordance with FDA 21 CFR Part 11.

WinCC/Audit enables the simple configuration of audit trails that can be used both for tracing changes in the engineering and for the runtime mode of the WinCC application. Changes are saved,
Sweet Success in Thailand

For more than 5 years Siemens is now working together with the United Farmers Industry Corporation (UFIC), one of the largest sugar mills in Thailand. With the successful implementation of the first PCS 7 process control system combined with the sugar application software Nahmat crystal control for a sugar factory in Thailand, this joint project started into the cardinal step of the modernization of the entire plant.

At the beginning of the project, Siemens together with UFIC calculated the new automation solution’s Return of Invest by performing a detailed factory audit. A second step was the installation of a Nahmat Pan Control local automation unit for the automation of one out of 26 batch crystallization pans. After that, UFIC management decided to modernize the factory using the Simatic PCS 7 and Nahmat.

The new system was successfully implemented and is running to the full satisfaction of the customer ensuring that the refinery section is always producing sugar to a predefined and reliably excellent quality.

Thailand is one of the biggest sugar-producing countries in the world

Charting the Future – at the Process Automation Annual User Conference

The Siemens Process Automation User Community will hold its annual conference in Baltimore, Maryland, USA, from October 8 to 10, 2003. All users of Siemens process automation systems are welcome to attend this extraordinary event, which provides opportunities for the users of the Siemens process automation systems to come together to exchange information, learn from each other, and provide feedback to Siemens. Users share best practices, presenting their applications to their peers, resulting in real-world uses and knowledge sharing.

This year’s conference theme is “Charting Our Future” and will include presentations and discussions lead by User Community members, as well as Siemens’ experts. Preceding the user conference, on October 6 and 7, several in-depth training courses on process automation and process safety topics will be offered.

The conference delivers a view into the future direction of Siemens, its current products, and even an opportunity for input into future products and enhancements.

For more information on the conference, as well as a brief video clip, please visit our website.
MES solutions are playing an increasingly important role in the food and beverage industry

Clever Use of Information

Buzzwords such as supply chain management, time-to-market, traceability, and so forth are the decisive criteria for successful production, even for products such as yogurt, bread, and apple juice. Reacting quickly to market demands, launching new products on the market faster and faster, and at the same time continuously increasing the quality of the products – as in many other industries, that’s the only way to survive in this market segment. With high-performance systems such as Simatic IT, companies can better exploit their know-how and at the same time meet increasingly strict legal requirements.

Successfully fighting off competition is becoming more and more difficult for companies in the food and beverage (F&B) industry. In addition to product quality, they also need a wide range of products in order to discover and exploit market opportunities, as well as high process flexibility in order to adapt production quickly to changes in consumer habits. At the same time, consumers are placing more and more importance on whether they can trust the brand, the company, or the particular product. The growing desire of consumers to do something for their health with their daily nourishment is reflected in the trend toward “nutraceuticals” – that is, foodstuffs that are enriched by vitamins, minerals, or other healthy additives. The border between foodstuffs and drugs becomes blurred in this field, and production must increasingly comply with regulations for the production of pharmaceuticals.

Uniform regulations soon to reach Europe

Many aspects of pharmaceutical production are therefore becoming increasingly important in the F&B sector – the key is traceability. With the American FDA (Food and Drug Administration) already ruling internationally where food safety and risk management are concerned, now the European Union holds the belief that it is necessary to establish a common legal framework that requires the F&B industry to establish comprehensive systems of traceability. The creation of the European
Simatic IT Unilab: Number 1 for F&B

With the laboratory information management system (LIMS) Simatic IT Unilab, the quality and availability of lab results can be increased and at the same time personnel costs reduced. The system can be used both as a standalone solution and together with a complete Simatic IT MES package. Thanks to integrated Web interfaces, the information is available not only to lab personnel but is also directly accessible for process optimization, for example.

Version 5.0, presented in May this year, has also had a few important features added. The new version of Simatic IT Unilab supports 21 CFR 11 compliance, the FDA guideline that defines the conditions of use for electronic records and signatures. Data can now also be collected and transferred through pocket or tablet PCs and copied into the system. The stability module supports lab personnel in determining how raw material or product properties vary with time under the influence of environmental factors or conditions such as temperature, humidity, and light, thus simplifying proactive quality management.

Simatic IT Unilab has set new standards with its efficiency and reliability, as the ARC Advisory Group confirms in its latest LIMS Worldwide Outlook (2003). The study ranks Unilab as the number one reference software for LIMS in the F&B market. “The Siemens system is by far the most solid LIMS solution for the food and beverage industry,” says Will Chin, research director at ARC.

Simatic IT Unilab: Number 1 for F&B

Food Safety Authority (EFSA) in 2002 illustrates this trend, and the effects of EU proposals to consolidate food safety regulations in the EU will probably be concluded with the introduction of traceability regulations in 2005.

A new concept provides a network

This will mean that food and feed businesses will have to be able to identify both suppliers and customers, and they must have in place systems and procedures that will allow the information to be made available to the authorities upon demand. To achieve this, a well-designed IT structure that records and processes all the relevant information – even beyond the company borders – is crucial. With a common platform, potential for rationalization can also be exploited all along the productivity chain, from the production of the raw materials right through to sales of the end products. The foundation for more efficient and, above all, more flexible production can be created. Transparent process management in production can contribute to faster reactions to changing market demands and a reduction in waste.

Production and business administration can be linked by manufacturing execution systems (MES) such as Simatic IT. The basic MES functionality, such as found in Simatic IT Production suite, includes Simatic IT Framework with modeling capabilities. Production modeling allows to visualize every blender, mixer, heater, weighing and measuring station, packaging line in the process environment, coordinating functionality and creating transparency and visibility in the plant. Another important functionality is material management, which makes it possible to trace a batch upstream (to raw materials) or downstream (logistics) from every operational sequence to the batch record.

In addition to basic MES functionality, there are other more specific applications like plant information management tools and the evaluation of the process information according to key performance indicators. The current state of production can be assessed and directly optimized in this way.

Laboratory information management systems (LIMS) manage the entire workflow in the laboratory – from obtaining and recording samples, to automatic log files and management and archiving of standards (standard operating procedures, SOP), right up to monitoring compliance with regulations and guidelines. This process guarantees product quality and allows early recognition of problems and prompt introduction of countermeasures.

Production specifications are without a doubt among the most important company assets. Suitable specification management systems such as Simatic IT Interspec manage all information associated with a specific product, including the nutritional value data, storage conditions, material calculations, types of packaging, and product-specific recipes.

Harmonization of product specifications and the ability to make them available for all plants and divisions in an enterprise is particularly important in managing product liability in F&B industries. It also allows more global buying, which can lead to significant savings.

Inez Costenoble, Ninove
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Siemens MES Technology for the Chinese Tobacco Manufacturing Industry

Setting Standards

Siemens and its Chinese partners Siemens Factory Automation Engineering Ltd and Jiu Hui Information Technology Limited have closed a major MES-deal worth one million Euro with a major tobacco manufacturer in China. The contract, signed in April 2003, the Etsong Group CEO, the plant managers and the general management of Siemens A&D in China, includes the entire Simatic IT Manufacturing Execution Systems (MES) portfolio.

This deal is a vote of confidence in the renewed and extended Siemens Simatic IT MES product portfolio and marks the first time MES-technology is being implemented in the Chinese tobacco industry. After very hard competition with other competitors, Siemens as a major industrial automation innovator finally won the project to set an MES-standard, integrating the ERP business systems and the automation level.

Entire Simatic IT portfolio will be implemented

The goal of the implementation will be to drive production with business information in real time, which will result in significant business benefits translated in manufacturing efficiency, cost reduction, better quality and higher responsiveness and thus higher profitability.

The project includes the entire Simatic IT portfolio, covering the basic MES functionality comprised in Production Suite, but also more specific functionality such as Quality Management using Simatic IT Unilab, Product Specifications Management with Simatic IT Interspec, Simatic IT Historian as a Plant Information and KPI management, and Detailed Production Scheduling. The benefits of implementing Simatic IT are crucial for the end user to maintain and secure the competitive position now and in the future.

First project in Qingdao

The customer is a major government held Chinese tobacco producer, employing more than 10,000 people and with an annual turnover of 5 billion Euro. The Etsong Tobacco Corporation Ltd. has decided in favor of the Simatic IT MES-portfolio for a pilot plant in Qingdao because it enables the realization of the business and manufacturing strategies of the company.

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Inez Costenoble, Ninove
The new cooperation made its debut at the Achema in Frankfurt: Peter Madsen of Danfoss and Renate Breuer of Siemens both attended to the visitors on the joint fair booth featuring the joint portfolio. Siemens Flow Instruments is taking over almost the entire staff of the Danfoss Flow Division, including the regional sales forces. By doing so, Siemens can ensure that in most cases, customers will stay in contact with their partners and can choose the ideal solution from the extended range of Siemens Flow Instruments. Siemens will also guarantee the same spare parts supply and warranty obligations for all flow products delivered by Danfoss as for all Siemens’ own products.

With the acquisition of the Danfoss Flow Division, Siemens has extended its range of magnetic-inductive and ultrasonic flow meters. In addition, Siemens can now offer coriolis-based flow-monitoring devices, which determine mass flow using the coriolis force principle and therefore operate completely independently of material variables, such as density or volume.

Securing and extending know-how

The combination of the expertise of two industry leaders provides customers the benefit of being able to purchase all flow-monitoring instruments from one provider. Over the years, Danfoss has established specialists in the company’s headquarters who concentrated on the various flow measurement tasks in the fields of water and sewage, pharmaceuticals, chemicals and utilities as well as in the process industry, including the food and beverages and tobacco industries. Siemens will maintain this great wealth of experience and add its own process automation know-how to advise customers and provide solutions to flow-measuring problems.

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Important future market

Anton S. Huber, director at the Siemens Automation and Drives Division, sees this latest acquisition as the logical continuation of Siemens’ commitment to the important future market for process automation. About one-quarter of today’s process instrumentation requirements are instruments for flow measurement. According to Huber: “With the takeover of the flow-measuring technology activities from Danfoss, we have consistently expanded our process automation. Danfoss flow-measuring technology is an excellent addition to our process instrumentation and closes an important product and technology gap in our portfolio. We have also improved the market access to important customers and regions. The extended product portfolio considerably strengthens our competitive position and makes us even more attractive as a partner.”

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The main season for the sugar industry is the time of the sugar beet harvest in early fall. The machines are in full swing and operating around the clock. Just in time for the sugar beet campaign of 2002, Südzucker AG of Mannheim/Ochsenfurt had the existing automatic measuring and control equipment and the control technology at the company’s factory in Wabern overhauled with Siemens automation technology. Previously, the factory had operated with a steam generator installed in 1976.

The boiler contains four parallel-stream burners that are equipped for burning heavy heating oil and natural gas. It produces an output of 60 and 80 tons of steam per hour respectively, at a superheated steam pressure of 51 bar and a superheated steam temperature of 465 degrees Celsius. Measurements were previously acquired by the individual controllers, display instruments, setpoint potentiometers, recorders, and signal lamps that were integrated in the control room. The conventional control technology originally consisted of five Simatic S5-110F controllers for the interlocks and the four burners.

The decision to modernize was made in 2001. The existing process measuring and control technology were to be upgraded with Siemens automation technology, with the aim of simplifying operation and maintenance, increasing cost-effectiveness, and reducing emissions. A lambda control for optimizing the fuel-air ratio was added to the boiler controller for this

Innovative boiler automation at Südzucker AG

PCS 7 Builds up Steam

A crucial phase for the Südzucker AG sugar factories begins every year in the fall when all machines are in full swing. The trouble-free operation and unrestricted availability of all machines, pans, and devices is an absolute must during the sugar campaign. That is why Südzucker AG chose the Simatic PCS7 process control system with the fail-safe and highly available automation system AS 417-FH, which operates on a redundant principle and practically rules out faults for the company’s factory in Wabern.

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Crystallization know-how from Siemens

Sugar crystals grow from sugar beet or sugar cane thick juice that has a yellow-brown color. In order to obtain white refined sugar, the sucrose that accounts for more than 99 percent of the sugar must be skillfully crystallized from the oversaturated solution in the sugar pans. Control of this crystallization process requires a great deal of expert knowledge. Because the quality requirements for sugar as an end product are becoming ever greater, the demands on production control are becoming increasingly rigorous. Through an optimized crystallization rate, temperature influences are minimized and energy consumption reduced. A narrow, uniform crystal size distribution simplifies further processing and increases the yield.

Siemens has been working with the sugar industry for more than 50 years on automation solutions that can monitor and control the complex crystallization process. At the beginning of the 1980s, Siemens used the know-how it had gained from this long partnership to launch a comprehensive software package for controlling the crystallization process parallel to the development of the Teleperm M process control system: the Nahmat crystallization software. With Nahmat the process can be reliably controlled and sugar produced in the desired quality. This increases the yield of the process, and the investment in the new automation solution usually pays off within 200 to 300 days of operation. More than 900 sugar pans automated with Nahmat are evidence enough of this success.

About 6,600 tons of sugar beets per day are processed in Wabern during the sugar campaign

Purpose. Of prime importance, however, was increasing the availability and operational reliability of the boiler. The conversion took into account the existing functions and did not result in changes in the use of the boiler or the boiler’s operating parameters. Südzucker AG chose the fail-safe and high availability AS 417-FH automation system for the new equipment on the basis of the Simatic PCS7 process control system already installed at the factory.

Redundancy guarantees safety

The conversion was to be complete by the beginning of the harvest season in the fall of 2002. The factory works around the clock during harvest time. For three months, approximately 6,600 tons of sugar beets are processed per day. It takes 10 hours with the machines in full swing to turn the beets into consumer-grade sugar.

The project was executed in close cooperation between Südzucker AG and Siemens. Südzucker AG coordinated the plant conversion, operation and visualization functions, and the software of the drive control, and Siemens was responsible for the switch gear cabinets, software programming, and integration. The commissioning, testing, and trial runs were done in one step at the end of the project.

A major feature of the new automation technology is the redundant design of the system up to the I/O periphery. Trouble-free operation is guaranteed even in the event of a fault. The “hot standby” operation of the central unit of the automation system and the bus system guarantees greater safety as well. The “hot swap” capability of the I/O periphery also avoids failures by enabling modules to be exchanged even with the machines running.

By consistent integration of all the regulation and control functions – including the fail-safe control – in a high availability system, the system complexity and number of external interfaces and components are minimized. Possible signal faults due to EMC coupling and cable and connection
errors are successfully reduced by a distributed arrangement of the peripherals, which minimizes wiring as a result.

Transparency due to TIA

The operating personnel also benefit from the PCS7 system. The boiler is easier to operate because its relevant process parameters are displayed in a concise layout. A sophisticated signaling system gives warnings long before a fault occurs and provides information about the causes of the fault. Indi-

vidual values can be traced very simply with trend diagrams.

The high degree of transparency is enabled by TIA (Totally Integrated Automation) and the simultaneous integration of all the regulating and control components into one control system. The entire system, including the I/O periphery, is monitored closely. The service personnel have a uniform package of functions for hardware and software engineering and diagnostics at their disposal.

The new plant and the boiler had to go through a trial by fire in the literal sense during the sugar beet harvest. Siemens and the Simatic PCS7 passed this test admirably and fully met the customer’s expectations. The boiler in the Wabern factory is now building up steam – with all the advantages of state-of-the-art control technology, thanks to PCS7.

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Freshly pressed orange juice from Brazil on the way to North America and Europe

Orange Sky – Successful Teamwork

The Orange Sky is one of the first ships transporting juice directly from the orange in a liquid state. Getting the ship fit for this task was not only a technical challenge it was also dependent on an excellently functioning international management of the parties involved in the equipping – Brazilian juice producer, Atlanship Ship Management Company, Lloyd Werft, Bremerhaven and Siemens.
Whether nectar, orange juice drink or pure orange juice – most orange juices you will find in supermarkets are made of concentrate diluted with filtered water. A new term has recently been added to the range of orange juice products: NFC (not from concentrate). “Directly pressed and filled” – printed on the pack, this indicates that the juice comes exclusively from the fruit, e.g. from oranges, and is not made from concentrate and is therefore an NFC drink.

The largest quantities of NFC juices come from Florida and Brazil. There, it is manufactured and exported all over the world by large companies. One of these companies is the Brazilian outfit Cutrale. With more than 30 million trees, Cutrale is the world’s largest producer of citrus fruits. After the harvest, the citrus fruits are processed in plants similar to refineries as concentrate or NFC. In the production of NFC, the juice and the pulp are separated during pressing. The pulpless juice is then usually first heated and then deep frozen as a preservative and finally loaded in a frozen state in refrigerator holds for shipping all over the world.

As good as freshly pressed …

… frozen juice isn’t – at least according to consumer opinion. That’s understandable because it’s quite probable that pulp from Florida is mixed with juice from Brazil.

Two things are very important for transporting or storing fresh orange juice in the high-grade steel tanks. For one thing, the juice must be kept at an exactly defined low temperature. For another, the tank must be absolutely germ-free and may therefore have no contact at all with air or oxygen. This is guaranteed by blowing in nitrogen (N₂). Both the temperature and the N₂ pressure must be measured continuously (every second) and regulated. An hourly report is printed automatically.

Cooling, pressure and temperature regulation and filling level measurement all take place fully automatically. Every tank is fitted with a Siemens radar level monitoring device, two Siemens pressure transmitters (for measuring the filling level by the static pressure and measurement of the N₂ pressure), a Siemens temperature transmitter and several flow meters, position controllers and switches.

A Simatic PCS 7 process control system is used. The communication between the control system, cooling system control (Simatic S7-300) and the SCADA system (two redundant Simatic WinCC servers) is taken care of by Industrial Ethernet. The link to the rest of the periphery as well as various drive systems (Micromaster) is made via Profibus DP (some segments apply fibre optic versions), the link to the process instrumentation via Profibus PA. The AS-Interface bus system connected to Profibus via DP/AS-I-Links is also utilized and integrates various motor switches and valves in the overall system.
During thawing. To meet the demand for even more “genuine” freshly pressed orange juice, Cutrale has decided to transport liquid orange juice on appropriately converted ships and to store it at suitable tank farms.

The freighter “May Oldendorff” set out on its maiden voyage three years ago. In August 2001 the owners, Adriatic Reefer Corp. Inc., La Tour-de-Peilz (Management: Atlanship S.A., La Tour-de-Peilz, Switzerland), bought the ship and converted it into a juice tanker which first went into service in October 2002, now renamed “Orange Sky”. Ever since, the Orange Sky has been carrying the valuable juice from Santos, the São Paulo harbor, to the United States (Florida and New York) and in future will also be sailing to Europe (Rotterdam).

The ship which still sails under Liberian flag (approx. 172 meters long, 27 meters wide and a draught of 9.7 meters) reaches a maximum speed of almost 15 knots with a drive of 9600 hp. Four of the 15 tanks are filled with liquid orange juice at the moment. The rest of the holds still contain deep frozen juice.

To turn the freighter which used to carry grain into a tanker, a complete overhaul of the electrical installations was necessary in addition to the reconstruction. The conversion itself was done by Lloyd’s at their shipyard in Bremerhaven. Lloyd’s contracted Siemens Industrial Services Germany to plan, install and commission the electrical installations.

To avoid expensive pasteurization processes, the juice must be stored in absolutely germ-free tanks. These must not only be pre-cooled but must also be kept at a defined atmospheric pressure and temperature. Such a sensitive process requires an appropriately sophisticated process automation. The contract for the process automation on board the Orange Sky was awarded to the Process Solution Division of Siemens Energy & Automation (SE&A) in St. Louis in the United States (whereby the contracting company was not the Bremerhaven shipyard but the Swiss shipping company). SE&A had already provided the process automation for another tank farm for fresh orange juice in Newark.

Apart from the American engineers, the experts for process instrumentation in Karlsruhe (see inset for technical details) were also involved. The general management for the process automation project was in the hands of Ingo Magura from SE&A, St. Louis.

Global player with high efficiency

Siemens’ significant involvement in the retrofitting of the Orange Sky with these two projects – electrical installation and process automation – was not only due to their suitable, wide range of products and services, worldwide presence and their experience as a highly efficient global player also played an extremely important role. “Certainly all the more so where – as in the project described here – different customers from different countries with different relationships to each other are involved,” Corporate Account Manager Steve Appleton confirms. The function of a Corporate Account Manager as a “string-puller” on the Siemens side has certainly paid off. “The CAM knows the customers and through local Siemens account management – in this particular case M. Brunetti in Brazil and J. Ducharme in the USA – opens the appropriate doors. Together, they can best judge who should or must be involved within the company. They can also give the customer or customers a general idea of the competencies and possibilities on site.”

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Large filter presses flexibly equipped with Simatic Mobile Panel 170

Operating Ease “To Go”

Mobile operating panels are the ideal solution when it comes to setting up several plants or plant sections – and that’s not just because of the lower hardware costs. The mobile operating concept also reduces staff. For example, on the up to 18-meter-long filter presses made by Netzsch, one person can perform the set-up instead of two. Moreover, Mobile Panel 170 makes the whole procedure much more flexible and convenient.

Netzsch Filtrationstechnik GmbH in Selb, Germany is the world market and technology leader in the field of filter presses and was the first manufacturer to develop fully automatic and thus virtually-continuously operating chamber and membrane filter presses. High-performance pumps from Netzsch feed the presses with slurry. More than 100 filter chambers and filter plates with a size up to two-by-two meters enable maximum throughput.

The filtration specialist has developed a sophisticated solution for removing even very adhesive filter cake quickly and completely from the filter cloths in an automatic process: The filter press is fitted with an automatic scraping device which travels along the whole length of the plant. After the filtration process, the filter chambers are separated from each other so that two scrapers supported from the inside can scrape the filter cake from the top to the bottom of the filter cloth on both sides.

To reduce the scraping cycle time even further, the engineers at Netzsch have introduced two successful measures. First, they equipped the pneumatically operated scrapers with efficient electronic Simodrive 611U servo drives. Second, they developed an innovative mobile set-up and readjustment solution from the product range of the world market leader. The first improvement reduces the cycle time for a scraping process from 25 to only 15 seconds per filter chamber. The second brings advantages in the hardware costs and also makes set-up much more flexible, more convenient, and also cheaper.

A Spanish company, the first beneficiary of these innovations, extracts about 140 tons of minerals every day on two fully automatic diaphragm filter presses from Netzsch.

Simatic Mobile Panel 170 – easy mobile operation

Using the Simatic Mobile Panel 170, Netzsch has found a smooth mobile solution for greater HMI flexibility and efficiency. It replaces a more complex in-house solution – a Simatic Operator Panel OP7 converted into a mobile device that was connected to the control in the operating cabinet by a Profibus cable and supplied information locally in text form. To set up the filter press, one person stood at the main operating panel in the switch cabinet and another person at the OP7 on the moving scraper. These two had to communicate by hand signals and shouting. Only the main operating panel had the full range of operating and monitoring functions.

Identical user interfaces

Roland Schelter, who is responsible for the electrical engineering of all Netzsch machines, appreciates the advantages of the new mobile operating panel. He particularly appreciates the identical graphical user interfaces on the main operating panel Simatic OP 170B and the Mobile Panel 170 on site. “This will save us at least two days’ configuration work in the future,” he says, “because we can take over the identical configuration and no longer need to take other devices into consideration.”

A junction box is mounted directly on the scraper, which communicates with the Simatic S7-315-2 DP plant control via Profibus or MPI and supplies the Mobile Panel with power and data. The Mobile Panel 170 can be plugged into or unplugged from the junction box “Plus” even with the filter press running without triggering the emergency stop circuit and thus interrupting production. This is an important feature for many customers because producers often have two or more filter presses of the same type in parallel production. A Mobile Panel can then be used to control these alternately. The operator has the full range of operating and monitoring functions at his disposal on the scraper so that he can set the press alone without assistance.

Netzsch has developed about 10 screen masks with the ProTool configuration software that has been used until now. Now process parameters such as the horizontal and vertical travel distances of the scrapers, the pump pressures, or times can be set locally by 14 function keys. For time-critical switching and control processes with very short reaction times, the membrane keys can also be used as DP direct keys (I/O periphery). The Profibus diagnostics are also available directly on
the scraper, which further simplifies optimization of the plant. Like all Simatic panels, the Mobile Panel 170 fits easily into Totally Integrated Automation.

Robust, reliable, and safe
The decision to adopt the new panel was also influenced by its unlimited industrial compatibility. The compact, lightweight device is resistant to vibration and shock – it even takes a fall from a height of 1.5 meters without damage. Such stress can only be withstood by an operating system without a hard disk, such as Windows CE 3.0. The system also offers the possibility of a full graphic display in 16 colors. The housing of the Mobile Panel 170 is robust, designed to IP65 (NEMA 4) standards, and is thus optimally protected against water jets in the event of leaks or when the plant is cleaned.

The Stop button on the Mobile Panel was a very important feature for the electrical design engineers. It is used to shut down the press immediately and safely in the event of danger. According to safety regulations, the Stop and Release buttons must be designed with two separate circuits – this meets the requirements of safety category 3 in accordance with EN 954-1. To avoid confusion with the emergency stop device, the Stop button is gray in color.

Expandable solution
“The Mobile Panel 170 will become the HMI standard for all our filter presses,” Roland Schelter believes. “It makes set-up and tooling much more convenient and flexible, and a lot cheaper.” Illuminated pushbuttons, key-operated switches, and a hand wheel may not have been used on the first two plants but they are a useful option for the future. The latter, for example, can be used for exact, continuous positioning or traversing of the scraper’s servo drives. Several junction boxes are also conceivable on the larger filter presses – and different visualizations on presses that are not identical would even be theoretically possible with the Mobile Panel.

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All the data readily at hand: Simatic Mobile Panel 170 with graphical user interface
Braumat process control system successfully implemented at Beck & Co. in Bremen

A Clear Advantage

The renowned German brewery Beck & Co. in Bremen produces several million hectoliters of beer every year – and that figure is rising. In view of increased sales and the demands of future production growth, Beck & Co. replaced the existing filter cellars with a new, central, fully automatic plant with four filter lines when the company was performing extensive modernization of the beer logistics. For the automation of the new filter cellar, Beck once again chose the Braumat process control system as it already had for other sections of the brewery. The existing Braumat systems in other sections of the brewery were simultaneously upgraded to the new Braumat V4.6 version that is also used in the new filter cellar.

The existing filter cellars had been operating at their production limits for some time. Beck & Co., one of the largest breweries in Germany and a full subsidiary of the Interbrew company, decided to modernize its entire beer logistics and further improve the quality of the popular brew with new filtration technology.

At Beck & Co., practically all the important areas were upgraded, beginning with the so-called unfiltrate binding and distribution – that is, the feeding of the unfiltered beer to filtration. In addition, 46 pressure tanks, flow and follow-up tanks, and a residue beer tank were newly installed and automated. The valve nodes for distribution to the pressure tanks – as well as for distribution of the pressure tank contents on the 14 filling plants for bottles, barrels, and cans – were newly installed and automated. The four new filter lines are equipped with diatomite filters, carboblending units, and particle filters; an additional fine filter for a filter line rounds off the equipment.

Siemens won the order as general contractor for the subproject providing automation technology for the new central filter cellar at Beck & Co. Together with ATM GmbH and Filtrox AG, Siemens formed the “new central filter cellar” work team. Within the project, ATM was responsible for the entire piping construction – a total of 30 kilometers of new pipes – and the machine assembly. Filtrox was responsible for the process technology and installed the machines for all of the filter lines, subplants, CIP (Cleaning in Place) systems, and the new pressure tank cellar.

Siemens took over responsibility for the electrical and automation technology for all sections of the new central filter cellar – including the measuring technology and its mechanical interfaces. Siemens Solution Process Automation in Würzburg carried sole responsibility, from the planning to the hardware and software design and engineering, up to delivery, installation, and commissioning of the new plant. Siemens also managed the integration of existing facilities such as the filling plants, electrical and pneumatic installations, and switch gear cabinet construction and was responsible for project management and the training of operating and service personnel.

All brewery sections equipped with a uniform control system

In the course of the project Beck & Co. also upgraded the existing Braumat systems in the brew houses and brewing wort cooling lines to the Braumat V4.6 version of the filter cellar so that the brewery sections are all operated by a common and homogeneous process control system. Highly efficient Braumat data links transfer the order, operating, and production data to the management information system (MIS). Simatic ET 200S I/O devices pick up the signals in the field.

The new electrical and automation equipment of the facility supplies, records, and controls all the measurements: flow monitoring, temperature and reference value monitoring, filling level limits, and volume monitoring, as well as pressure monitoring. Added to these are the brewery-specific measurements such as oxygen, turbidity, carbon dioxide content, original wort, and color units. The control system also includes 3,500 mix-proof and flap valves with position feedback, and 250 motor and pump drives, of which 90 percent are controlled by frequency converters.

The nucleus of the system is formed by two Braumat servers, five Braumat clients, and seven Braumat S7-400 controllers connected with more than 300 distributed ET 200 systems via Profibus. The system processes more than 700 analog values and over 8,000 digital signals.

Braumat is connected via Profibus DP directly with the instrumentation, the power components such as motor controllers and converters, and the valves and their process terminating devices. The field devices of the carbo-blending units are connected to the control system via Profibus PA. The communication with the operating data entry system takes place via the BDE-CIS link of the Braumat system. In this way, all order and batch data with the associated logs, signals, and relevant data can be transferred up-to-date for further processing. This expensive con-
version required additional switch gear cabinets and boxes, but in some cases (such as the integration of the existing filling systems) the new components could be integrated into existing switch gear cabinets on site.

Changeover on the fly

At the end of the project, the new system had to surmount another challenge. The two old filter cellars were shut down, the existing pressure tanks disconnected, and the new filter cellars put into operation without interrupting production. The filling lines were also integrated during ongoing brewery production. Thanks to the excellent advance planning of the project team, the changeover to the new system took place without a hitch. The new central filter cellar went into operation in August 2002 and was able to live up to all expectations. The filter cellar and Braumat are also prepared for further increases in production. The plant can be extended to up to six filter lines.

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Almost 50 years ago, Richard Hartinger decided to enter his father’s cider business, and in 1956 he founded the first plant for juice production in Rinteln in Lower Saxony. Today, in addition to the Wesergold factory in Rinteln, the Richard Hartinger Beverages Group has production plants at two other German locations as well as factories in Switzerland and Spain. Together they produce about 50 million units of fruit and vegetable juices, soft drinks, mineral water, and fruit juice drinks every day.

One of the products made at the Rinteln factory is carrot juice, which is stored in 25-foot-high sterile tanks. The tanks are operated at an excess pressure of 0.3 bar. Moreover, the juice tends to froth excessively. Conventional methods were therefore unable to reliably monitor the filling level in the tanks, and Wesergold was consequently searching for an alternative solution.

**Pulse-radar technology masters a difficult task**

The Sitrans LR 300 measuring instruments were tailor-made for this job. The advanced radar level-monitoring device uses sophisticated microwave-pulse technology, which enables a reliable, continuous level monitoring of liquids or pulps even under extreme process conditions. The Sitrans LR 300 operates reliably under extreme temperatures and pressures and is insensitive to steam, dense froth, smoke, dust, or condensation. Aggressive chemicals, materials with a tendency to form crusts, or strong turbulence and the use of stirrers in the tank have practically no effect on the measuring procedure.

**More applications**

Sitrans LR 300 is thus also able to monitor the filling level reliably in Rinteln – even through the froth. The first Sitrans LR 300 was installed in Rinteln two years ago. Now a total of seven tanks have been fitted with LR 300 measuring instruments – and Wesergold is totally satisfied with this solution.

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**A Closer Look**

The Wesergold brand is an important segment of the traditional Richard Hartinger Beverages Group. The products manufactured by Wesergold in Rinteln include vegetable juices as well as fruit juices. The storage of carrot juice initially posed a problem for the company: high temperatures and a strong development of froth made things difficult for conventional filling-level meters. Wesergold finally found the right solution in the Sitrans LR 300 devices from Siemens – and has since installed LR 300 on seven tanks.
T
de two original production lines were commissioned in 1996 and automated with Siemens S5 PLCs. The third line was originally manually operated and is being automated during reinstallation in Cilegon. The new process control system is based on Siemens’ PCS7 with the tightly integrated Batch flexible batch management system.

The control system uses redundant servers, which also act as Operator Stations. A third Operator station and an Engineering Station are connected as clients. Siemens’ MIS-Light database software is deployed on a dedicated server for long term archiving of batch reports and other process data. The MIS-Light package was selected because it provides standard interfaces to Batch flexible and PCS7, simplifying the database implementation. HMI process graphics have been developed using the PTE400 library, a PCS7 add-on providing a set of function blocks and faceplates for the process industries which has been adopted by Clariant as a standard on several of their sites. At the control level, Siemens Siwarex M weighing systems have been utilized to integrate high resolution weighing of the bulk raw material storage directly into the control system.

System design and prototyping

The project is being executed by Siemens Indonesia with initial project design and prototyping assistance provided by the Process Automation Solutions Regional Headquarters in Singapore. Configuration prototyping was a key feature of the initial design process allowing demonstration to the client of the capabilities and design opportunities available with PCS7 and Batch flexible. The prototype review proved invaluable in crystallizing the client’s requirements, deciding key design philosophies and identifying areas where additional client input was required. The exercise also served to bring the client’s key project stakeholders and the Siemens’ design engineers into close cooperation from the early stages of the project.

Increased plant productivity expected

Plant Manager Utun Sutrisna commented that the old S5 system proved reliable over many years and that they expected the same reliability from the new PCS 7 system. Anticipated benefits of the new system included a greatly enhanced operator interface with good visibility of the batch operations and improved scheduling and reporting capabilities. This will increase operational effectiveness with consequent improvements in plant productivity. The first line was commissioned in July 2003, with the remainder of the plant being commissioned in December.

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Siemens relies on a continuous dialogue with users

A Forum for the Chemical Industry

Always being ready to listen to customers’ wishes and needs is an important part of Siemens’ company strategy – even and especially in process automation. Constant cooperation with users in the chemical industry is therefore an important concern of the Forum for Field and Analysis Device Users, which Siemens recently founded. The aim of this forum is to take the chemical industry’s requirements increasingly into account in the development of field devices.

T he chemical industry’s requirements for automatic measuring and control technology are as diverse as the processes in which the devices are used. Explosion-hazardous production areas, plants with life cycles of 30 years and more, harsh ambient conditions or particularly strict safety requirements – these are the kinds of environments in which the field devices must prove their capabilities.

Pooling of interests

For this reason, leading chemical industry companies joined forces early on to collect and express their requirements for process control technology. As early as 1949, BASF, Bayer, and Hüls formed NAMUR, a manufacturer-independent interest group for automatic measuring and control technology users in the chemical industry.

NAMUR was established as the standards association for measuring and control technology. Then as now, the main goals of NAMUR were to improve functionality and reliability of the measuring technology, analyze control system technology, standardize interfaces, and exchange measuring and control instrumentation experience with other users.

NAMUR’s activities cover the whole life cycle of process control systems, from the design phase to the final dismantling of a plant, and include all fields of process control technology. Today, NAMUR boasts 85 member companies in Europe. Although it is still concentrated mainly in Europe, NAMUR is gaining more and more influence on an international level. The aim of all NAMUR activities is to organize and influence the development of automatic measuring and control technology from the chemical industry user’s viewpoint to achieve better control of the processes and to minimize the total cost of ownership. NAMUR then summarizes these results in worksheets and recommendations.

Continuous dialogue during development

NAMUR exploits the know-how of field device manufacturers. For example, Siemens works as NAMUR’s competent guest in appropriate workgroups. This means Siemens can integrate important trends and future requirements at an early stage of product development and its customers have the opportunity to use innovative products sooner.

To further promote the dialogue with users, Siemens has founded its own forum for field and analysis device users in the chemical industry. The aim of this forum is to provide background information and discussion points on important topics in field instrumentation and analysis as well as to answer frequently asked questions. In the industry portal, users will find a made-to-measure portfolio of products, systems, and solutions to help them optimize their processes.

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Enamel pH sensor for Sipan liquid analyzer

Robust Sensor

The differential enamel pH sensor has technical measuring properties designed specifically for process industry requirements. It is extraordinarily resistant and operates without a separate reference electrode, thus avoiding the aging effects of conventional methods and supplying reliable measured values that remain stable over a longer period of time.

A pH measuring system always comprises the respective measuring electrode, the reference system, and the analyzer. Both the measuring electrode and the reference electrode in the enamel probe are extremely large, resistant, ion-sensitive enamel layers melted onto a steel carrier. The enamel layers allow the sensor to be independent of watery electrolyte systems, enabling it to be stored dry for an unlimited period. The sensor can be connected to the Sipan analyzer by two symmetrical, high-ohmic inputs, thus extending the application possibilities of the proven Sipan liquid analyzers, especially for processes in chemical, pharmaceutical, or food and beverages industries.

The upper enamel (measuring electrode or pH enamel) reacts to hydrogen ions (H+) and supplies a concentration-dependent potential. The lower enamel (reference electrode) reacts to the salts dissolved in the liquid (especially to sodium ions) and supplies a product-specific reference potential. Unlike conventional glass electrodes, the differential pH sensor is calibrated with process or product samples rather than the usual buffer solutions.

Stable and resistant to aging

The differential pH sensor exhibits a linear response behavior between pH 3 and pH 11. Both electrodes are stable over the long term in their technical measuring properties and do not age. Therefore, it is possible to program the probe to a product or control point by setting a predetermined slope, thus creating optimum conditions for reliable and exact process measurements. Ideally, this measuring principle requires either a constant, or nearly constant, sodium content in the process medium or a knowledge of the possible fluctuations. The presence of fluoride ions in the solution limits the area of the sensor’s application because these ions damage the enamel. The sensor is suitable for use with clean-in-place systems, but only when certain specifications regarding alkali and acid concentration and temperature and cleaning duration are observed to minimize the influence on the enamel. Higher-concentration acids can also be used briefly for cleaning the removed sensor.

Versatile alternative

Provided that all sensor elements are fully wetted during the measurement and air entrapment is avoided, the differential pH sensor can be installed in virtually any position. The differential pH sensor requires no regular maintenance, making the cost of ownership very low by comparison. Therefore, the sensor is an interesting alternative to conventional glass pH probes, which are prone to breakage in many industries.

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New radar device enlarges Siemens level monitoring portfolio

More Choices

Whenever there is dust, heat or foam, radar level monitoring is the technology of choice. The Sitrans LR 400 and LR 300 devices from Siemens have already established themselves for difficult tasks – now Siemens has developed a new 2-wire device that features modern radar technology at a reasonable price: Sitrans LR 200 offers a cost-effective level measurement solution for liquid bulk storage or simple process vessels.

Commerially available radar units were first installed in the chemical and petro-chemical industries for high accuracy measurement on liquid chemical storage. Today, Radar now forms the mainstay technology for long-range hot and dusty applications, finally replacing mechanical technologies that were previously the only option.

Until recently however, relatively high investment costs for radar devices were often an obstacle in applications which had only moderate requirements for robustness and precision. This was why Siemens developed Sitrans LR 200, a new 2-wire, loop-powered pulse radar instrument from Siemens, offers a cost-effective level measurement solution for liquid bulk storage or simple process vessels.

Literally seamless construction

A special new feature is the Uni-Construction rod antenna. The threaded connection, shield and antenna wetted materials are all made of the same polypropylene material and hermetically sealed to prevent chemical ingress. The Uni-Construction antenna features an internal, integrated shield that eliminates nozzle interference. It fits easily into a threaded flange of even very small diameter nozzles. In addition to the Uni-Construction version, a Flange Adapter model offers modular fit with process connections and antenna options currently available from Siemens. This flange adapter version can be easily removed without breaking the process seal, making the instrument easy to maintain or upgrade.

The compact electronics are mounted on a rotating head, and the unique design allows you to program it without opening the lid, even in hazardous areas, using the infra-red, Intrinsically Safe handheld programmer.

High-performance measurement

The low frequency of 5.8 Gigahertz in Europe and 6.3 Gigahertz in North America is ideally suited to liquid level measurement. The high signal-to-noise ratio provides ample signal for a measuring range up to 20 meter. Rigid components make the device extremely robust, so that Sitrans LR 200 can resist pressures up to 40 bar and process temperatures up to 200 degree Celsius.

Sitrans LR 200 features patented Sonic Intelligence signal-processing technology for superior reliability, along with Auto False-Echo Suppression that detects and suppresses false echoes from tank obstructions. For use in hazardous areas, the Sitrans LR 200 is also available with ATEX approval.

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A well-functioning Service & Support portal on the Internet is a prerequisite for the effective support of customers in all project phases. It is an integral part of the Service & Support portfolio as an initial point of contact available all the time from anywhere.

In addition to its revised appearance and content, the new home page also takes users to the desired Service & Support item in German, English, French, Spanish, or Chinese faster than ever before. Direct links from the main navigation items “Product Support,” “Services,” “Info,” and “Support Shop” lead to all subcategories. There is also a context-related search engine and the opportunity to adapt the information on offer to one’s individual requirements. The “Contact” box leads to contacts all over the world for local service, spare parts orders, or technical support.

Info on more than 60,000 products

One of the portal’s basic tasks is to provide detailed information about the group’s more than 60,000 products. This information can now be called up from a product tree structure adapted exactly from the Internet catalog and the A&D Mall. The portal covers a broad variety of topics, including answers to FAQs, tips and tricks, downloads, and latest news for the selected product. More than 5,000 product manuals or instruction manuals are available in PDF format. The intelligent search engine speaks the automation engineer’s language: whole sentences or questions can be entered or terms linked logically. The result is a list of relevant articles from sources that can be pre-selected in the Knowledge Base, which holds about 170,000 documents. Users who can’t find what they are looking for can e-mail technical support.

Users registered for the free MySupport service can adapt the newsletter, bookmarks, forms, and product tree to their individual requirements and significantly simplify handling. They also have access to the Technical Forum, a worldwide user communication platform.

The Support Shop offers special support tools, including detailed program examples and complete solution elements that Service & Support has prepared from customer inquiries. These can be paid for with the Automation Value Card (AVC), which is rechargeable and is therefore a convenient means of payment for technical support.
At the **C. & A. Veltins brewery** in Grevenstein, the Swiss Siemens Automation Solution Provider bürge-fischer AG used ten Simatic S7-400 automation systems to modernize the pallet transport with 1,071 conveyor elements. This, the most powerful of the Simatic controllers, is, in many senses, a gain for Veltins. It optimizes the material flow, offers innovative material flow monitoring, and can be extended as needed thanks to its modularity. Using the communication module CP 443-1 IT, the brewery can save time and money by using remote maintenance through the Internet.

With a plant availability of more than 98 percent, the Chemicals Production Köln-Worringen of the **German BP AG** has an excellent reputation in the BP group – an achievement of which the people at Köln-Worringen are very proud of. The new ethane cracker was equipped with a high-performance, fast-reacting process analysis, which meets the high demands of the German BP. Köln-Worringen had already had good experience with the Maxum process gas chromatographs and is now using this technology in the new cracker.

The traditional **Burger Knäcke GmbH & Co. KG** company in Burg to the northeast of Magdeburg replaced the manual control of the material feed with weigh feeders when they were modernizing three different production lines. To follow the specified recipes in proportioning the ingredients, a high-precision flour feed is an absolute must. Therefore, Burger Knäcke chose the highly accurate Siemens Autoweigh Feeders 600 Series, which is ideal for such applications.

You can find more detailed information about these case studies at: [www.siemens.com/processnews](http://www.siemens.com/processnews)
One-Stop Information and Solutions: Industry Portals for the Beverages and Tobacco Industry

Which controller is right for my process? How can I link my production data to the ERP system? How can I make my processes more efficient? Siemens’ industry portals for the beverages and tobacco industry answer all these questions.

www.siemens.com/beverages
www.siemens.com/tobacco

Visitors to the tobacco portal can take a virtual tour of tobacco production and can obtain extensive information about Siemens’ industry-specific services.

The beverages portal is divided into the main areas of malt house, brewery, and soft drinks. For each step in the process, visitors are guided through Siemens’ portfolio of products, solutions, and services, ranging from sensors for the field level to automation and process control systems to complete MES and energy supply solutions. Extensive services from plant planning to training measures round out the program. The portal for the dairy industry should be ready by the end of the year.

Do you want to know more about the Siemens Automation and Drives systems and solutions for the process industry? Simply visit our information portal on the Internet:

www.siemens.com/processautomation

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Here you can download the current issue and past issues of Process news in PDF format, and search directly for articles about specific topics, technologies or systems in the Reference Center.

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The market for crop protection products is highly competitive: an extremely wide variety of active substances and intermediate products has to be manufactured in customer-specific batches, new products brought to market in the shortest possible time and patent lifetimes exploited to the full. Bayer CropScience AG is setting new standards with its new multipurpose plant in Dormagen, Germany. Through consistent use of fieldbus technology using PROFIBUS DP Siemens has implemented for the first time a fully integrated plant management system. This system collects information plant-wide from the process automation to the production control level, processes it and incorporates it seamlessly into the SAP system on site using SIMATIC IT Framework – all based on Totally Integrated Automation. And linked into this concept is the SIMATIC® PCS 7 process control system with SIMATIC Batch. The modular design of the plant supported by the MES solution permits highly flexible control of the production facilities, which can quickly be converted to other applications. Would you like more information on TIA? Of course! Send us a fax: 00800/74628427 with reference AD/1010.