Colors of India
Solutions for an economy based on innovation and tradition
At Asian Paints in Chennai, India, an integrated process automation solution based on Simatic PCS 7 and Simatic Batch ensures a higher transparency and flexibility.

The Indian pharmaceutical company Jubilant Organosys benefits from a more efficient and more transparent process control with Simatic PCS 7.

Profisafe and corresponding fail-safe process devices promote the application of field bus technology in the process industry.

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**EDITORIAL**

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Process automation in a large Colombian brewery
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Cover photo: panthermedia
One aspect of India is a history that goes back thousands of years and a fascinating variety of traditions and cultures. Another aspect of India is a country with modern cities and a booming industry. Currently, India’s gross national product is growing by approximately 8 percent per year; not only in the IT sector but also in the food and beverage industry as well as in the chemical, pharmaceutical and automotive industries. The economy is also supported by a solid domestic demand. These are some reasons why we chose India, one of the world’s most important markets, as the focus topic of this issue of Process News.

We at Siemens have another reason to look to India with both a sense of pride and ambition. Fifty years ago we opened the first production in Mumbai. Since then, we have enjoyed an enormous growth: Today, we are the market leader in India with our automation and drive technology.

India’s future holds many opportunities – but there are also challenges to overcome. More than one billion people living in India have to be supplied with drinking water and energy. Reasonable and sustainable exploitation of resources, efficient and environmentally friendly production methods: These are all fields where we will step up on our support for customers in India in coming years.

Recently, one of our customers became the first Indian company to choose a Safety Integrated solution that ensures a high level of safety for personnel, environment and equipment – reliably and economically. So we are promoting a fusion of economic thinking and process safety with our integrated safety concept also in India. With the introduction of the first Profisafe-compatible process instruments for Profibus PA, we are also extending our Safety Integrated range for the process industry.

We hope that we can provide some valuable insights in these and other interesting topics in this issue.

Enjoy the read!

Reinhold Schwulera
Head of A&D Business Development Asia-Pacific/Middle East Siemens Automation and Drives
Two new orders for equipping cement works

Siemens continues its rich tradition of being successfully associated with some of the most prestigious projects in the cement industry. The company has recently secured two large projects in Yemen and Nigeria. The contract partners are the National Cement Company of Yemen and the Ashaka Cement Plant (Lafarge) in Nigeria.

Siemens will supply the National Cement Company of Yemen with a turnkey solution for a new cement factory in Al Anad, near Eden, with a capacity of 4,200 tons per day. The contract includes the design and engineering of the factory’s electrical infrastructure, delivery of the equipment, supervision of the installation, the commissioning of the system, and training the personnel.

Siemens was also successful in winning two separate contracts in a consortium with Humboldt Wedag India Ltd. from Lafarge’s Ashaka Cement Factory in Nigeria. Siemens’ responsibilities include the supply, supervision of installation, and commissioning of the entire electrical and automation systems.

Find out more:
www.siemens.com/cement

Sitrans LR 400 conquers the Indian market

Leader in Cement

Sales of the Sitrans LR 400 transmitter in India have reached record figures with the continuing growth of the Indian building and cement industry over the last few years. Siemens sold more than 150 devices last year alone and has left its competitors far behind.

The largest single order was for 51 transmitters, which Toshbro Controls sold to the Lösche India company. Lösche India supplied the LR 400 devices as part of an automation package for Grasim Industries, one of the most important companies in the Indian cement market.

Because of its robust design and outstanding performance even in difficult applications, the Sitrans LR 400 radar transmitter is increasingly replacing traditional measurement methods. Many customers in India already see the Sitrans LR 400 as a de facto standard for radar level measurement – a success that the new, even more efficient successor model, the Sitrans LR 460, will certainly continue.

Find out more:
www.siemens.com/cement

Efficient Beer Production

Brewery supplier Ziemann Ludwigsburg is equipping the Bavaria S.A. de Valle brewery in Yumbo, Colombia, with state-of-the-art brewing equipment. Part of the solution is the process control system Simatic PCS 7 Braumat and Simatic Batch. This integrated solution offers Bavaria extensive functionality with relatively low project risk.

The brewery will be equipped with approximately 170 Sitrans P pressure transmitters and more than 150 temperature transmitters, as well as flowmeters and analyzers from Siemens. In addition, a manufacturing execution system based on Simatic IT is being implemented, which will include the integrated Unilab laboratory information management system.

The entire brewing process is being equipped with an integrated automation solution – the rice and malt handling, the brewhouse, the fermentation and storage cellars, the yeast plant, the filtration, and the bright beer tanks. This greenfield project includes project management, software engineering and commissioning, production and delivery of low-voltage cabinets, and hardware engineering. Engineering began at the beginning of April; the first brew is planned for early October 2007.

Bavaria belongs to the SAB Miller group and is Colombia’s largest producer of beverages. The brewery in Yumbo will brew the Aquila, Poker, and Costena brands. The brewery will have a capacity of approximately four million hectoliters when the expansion is complete.

Find out more:
www.siemens.com/breweries
Simatic PCS 7 in the world’s largest seawater desalination plant in Bahrain

Securing Water Supplies

Sidem, a subsidiary of Veolia Water Solutions & Technologies, is relying on Siemens technology in an expansion project at the largest seawater desalination plant in Bahrain.

The Kingdom of Bahrain is expanding the capacity of its seawater desalination plant from the current level of approximately 130,000 cubic meters per day by a further 260,000 cubic meters per day. When the project is complete, the plant in Al Hidd will treat 75 percent of the country’s drinking water.

Sidem chose the multiple-effect distillation (MED) process, in which drinking water is obtained through the evaporation and subsequent condensation of seawater. In order to manage the complex processes in the world’s largest MED plant, Sidem relies on the Simatic PCS7 process control system. Siemens also supplied 30 medium-voltage motors with a power output of 500 to 1,250 kilowatts. These efficient but economical motors drive the intake pumps that pump the seawater into the plant. Simatic PCS7 controls the processes in the 10 evaporator units and countless sub-aggregates. A key benefit of the system is the central process HMI in the central control room. This relieves the maintenance personnel of time-consuming routine jobs.

Find out more:
www.siemens.com/water

More than 850 Sitrans F M MAG 8000s monitor the water supply in Celaya, Mexico

Operating Convenience

Networks for irrigation require extensive monitoring systems that can contain a variety of different measuring instruments. When the Mexican National Water Commission was looking for a reliable flowmeter for irrigation systems and wells, one criterion was more important than all the others: the device had to be user-friendly so that the personnel would find it easier to optimize the performance of the irrigation system.

The National Water Commission therefore placed strict demands on the flowmeter’s user interface for irrigation in one of Mexico’s most important agricultural regions, in Celaya in the state of Guanajuato. Following an extensive evaluation process during which its auditors visited production plants in several countries, the National Water Commission ultimately chose Siemens and the Sitrans F M MAG 8000 flowmeter. The commission ordered more than 850 of these devices in total.

The MAG 8000 is a battery-powered flowmeter that is suitable for underground installation. The device can be operated with just one button and has a digital display and an infrared interface for data exchange. An integrated software tool records statistical data, such as flow minima and maxima and momentary or accumulated flow volumes, over a period of up to 26 months. The device therefore supplies all the information necessary for optimizing water supply and consumption.

Find out more:
www.siemens.com/water
Siemens India delivers solutions for a booming market

Focus on India

The Siemens Group in India is a leading provider of industrial and infrastructure solutions and plays a key role in India’s quest to develop modern infrastructure. We spoke with Vijay Paranjape, head of Siemens Automation and Drives India, about the challenges and opportunities in a booming market that is shaped by both tradition and innovation.

Mr. Paranjape, this year Siemens India is celebrating its 50th year of incorporation in India. How would you best describe the evolution of Siemens in these 50 years?

Vijay Paranjape: Siemens’ first association with India actually began 140 years ago, in 1867, with the laying of the telegraph line between London and Calcutta. Our manufacturing story began five decades ago in a very modest way. In 1956, we set up a repair workshop under the Mahalaxmi Bridge in Mumbai, where we started to assemble simple switchboards. This was the kernel for starting our manufacturing activities in India. At present, we have 17 manufacturing facilities spread across the country. Over the last 50 years, we have arrived at a very clear understanding of the Indian market’s requirements and earned customer confidence by offering appropriate products that have been engineered and designed using the world’s best technologies. Today, Siemens is a highly respected brand in India. Siemens had realized early that in order to become self-reliant, we have to develop products indigenously with local manufacturing facilities using local resources. As a matter of fact, 50 percent of business today comes from local products.
We are making products for India as well as for many other countries in the Asia Pacific region. These offerings have been developed taking into account conditions that are specific to the regions.

What role does the Automation and Drives portfolio play in India?

Vijay Paranjape: Although the Automation and Drives division is just 10 years old, the business has been in existence for 40 years. Today, we have four factories in India, and our business constitutes a very important part of Siemens in India. We are supporting progress in some of the main growth areas of India’s economy. To cite an example, in the wind power sector, through our wind turbines we have contributed around 3.3 gigawatts to date to the green energy. Similarly, we have also made some historic inroads especially in the automotive sector, where the first breakthroughs in Japanese auto companies have happened here in India.

What are these growth sectors?

Vijay Paranjape: India is the one of the world’s largest producers of milk, fruits, and vegetables. Due to demographic changes and the fact that more and more women in urban India are working, there has been a big change in the way food is sold. The demand for packaged food, and consequently for packaging machinery, has increased enormously. The production of milk powder at Mother Dairy (see pages 8 and 9) is just one example.

Another growth market is the pharmaceutical industry. The largest number of FDA-approved pharmaceutical plants outside America can be found here in India. Everybody knows Indian companies as generics manufacturers; however, Indian companies such as Ranbaxy and Dr. Reddy’s Lab, to name a few, have already started to develop their own active pharmaceutical ingredients. These companies are in an excellent position to create affordable drugs that will be marketed worldwide.

What are some of the key challenges and trends, and how can Siemens support its customers in these areas?

Vijay Paranjape: In a vast country like India, companies need more than a big plant – they need many process plants that can be small and efficient, but must deliver a level of quality that is as good as the quality delivered by a large plant. Scalability and modular design are key aspects here. Another challenge is tracking and tracing, and we offer a comprehensive range of solutions that are in line with FDA requirements. With Totally Integrated Automation, we can respond to the demand of the Indian process industry for ease in expandability and integrability of automation system.

When you picture Siemens Automation and Drives in India in 10 years, where will you stand? Where will the current growth take you?

Vijay Paranjape: We have become more self-reliant and have grown faster than the market. As a matter of fact, in the last three years we have almost tripled our sales. One key success factor for our business was and will continue to be our local manufacturing capability. We indigenously produce our solutions here. And this will also help us extend our activities to other regions and countries with similar environments and similar requirements. I definitely see Siemens Automation and Drives as a significant contributor to the continuing growth in India and the Asia Pacific market.

Mr. Paranjape, thank you for speaking with us.

Focus on Customer Care

The Siemens Automation and Drives division in India is committed to provide quality service support to all its customers located at diverse locations in the country. In its endeavor to optimally serve its customers, the division has set up a comprehensive customer care program that provides the following:

- Customer-friendly and efficient call-handling processes, from call logging to updates on status to the final closure of the call
- Response and resolution times as short as a few hours, depending on the criticality of the support request
- First-time-right solutions
- Value for money

Similarly, in order to provide prompt and effective support to its clients, the division has in place a dedicated setup that comprises the following:

- Customer Care Desk – A toll-free single point of contact for service needs concerning the entire range of Siemens Automation and Drives products and systems, coordinating the entire service cycle
- Hotline (Technical Support) – Technical support for all requests that can be effectively closed with support over the phone, minimizing resolution times
- Human Resources – A highly qualified network of both Siemens and service partner engineers (trained in India and abroad) located all over India
- Hardware Resources – Spare parts logistics available seven days a week
- Call Management System – Integrated monitoring and evaluation procedures to help maintain a high level of customer care quality

The Siemens Customer Care program also targets emerging technologies, such as Web or mobile services that can complement the service portfolio. The program intends to expand its local presence by extending the service network throughout India.

Find out more:
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Energy-efficient drive technology and comprehensive automation solution at Mother Dairy Gandhinagar

Integrated Benefits
To keep abreast of current market trends, India’s Mother Dairy Gandhinagar decided to realize the fully automated powder plant it had first conceived in 2000. Originally called in to design a completely integrated automation and electrical solution, Siemens has now implemented this innovative upgrade program involving some of the most advanced process and production control technology available in the food processing industry.

The Mother Dairy plant in Gandhinagar has the capacity to process 1.7 million liters of milk per day. Approximately 0.8 million liters are packaged as pouch milk; approximately 0.7 million liters are processed in the milk powder plant, which has a capacity of 60 tons per day; and 0.2 million liters are destined for aseptic packaging in cartons. The liquid milk fats are used to produced cream oil. The dairy also produces 40 tons of butter oil and 0.14 million liters of ice cream. Fermented products, whey drinks, mozzarella cheese, and pizza round out the product spectrum.

Milk powder is one of the fastest-growing market segments, so in 2000, Mother Dairy decided to build another milk powder plant with a capacity of 100 tons per day. This plant is unique in all of Asia due to its size and high degree of automation.

State-of-the-art technology gives competitive edge
Mother Dairy wanted to equip its state-of-the-art greenfield project with the latest process control, drive, and switchgear technology to maintain its technological and economic lead in India’s dairy products industry.

The major issue was energy efficiency in order to optimize operational costs. Mother Dairy also wanted to implement an integrated plant automation, instrumentation, and electrical solution that would enable uniform control and optimization of all processes. One focus in this context was process instrumentation integration, as the plant operators wanted to be able to calibrate and monitor the process instrumentation parameters from the central control room. That way, the staff of the existing milk powder production facility would be able to also run the new, larger capacity plant.

Consequently, Mother Dairy Gandhinagar opted for a comprehensive plant automation concept, including process instruments, remote I/O devices, electrical systems, and automation and drive technology. All remote devices were to be integrated with the process control system via bus technology, using Profinet and PA as well as AS-Interface for networking the process instruments and remote devices.

After comparing the Totally Integrated Automation approach suggested by Siemens with other solutions, Mother Dairy chose Siemens because the company was convinced that the Simatic PCS7 process control system could provide seamless integration with the existing plant network and all other third-party devices, including electrical equipment right down to the field level, thus enabling the comprehensive solution that Mother Dairy required. Mother Dairy Gandhinagar awarded the entire contract on an lump-sum turn-key basis to the EPC contractor M/s GEA Process Engineering INDIA Ltd., and eventually Siemens was chosen as the automation and electrical supplier.

Integrated automation and electrical solution
Siemens began working on this project from the concept stage of the powder plant and provided a complete functional design specification involving the linking of automation with high-voltage and low-voltage electrical equipment via Profinet. Variable-frequency drives, also linked with Profinet, were suggested for fans and blowers. This approach netted substantial energy savings. For the first time in a dairy environment in India, the pumps were equipped with smart motor control centers (MCCs) with Simocode systems and connected to the plantwide Profinet network, enabling control and monitoring of all pumps from the central control room. The plant is also equipped with Siemens switchgear technology on Profinet. The order also encompassed engineering design, software development, equipment supply, and system commissioning.

The smart MCCs prevent the pumps from running dry, which reduces maintenance and downtime. The plant automation solution also offers an integrated energy management system that helps plant personnel monitor the energy consumption in individual sections. Energy consumption for any shift can now be analyzed directly by the management. Since all units are on Profinet, diagnostics can now be performed from a central controller.

Strong market position
Multiple product operations, changes in technology, and distribution requirements have all necessitated a change in the automation concept at Mother Dairy Gandhinagar. With Totally Integrated Automation, Siemens has been able to provide Mother Dairy Gandhinagar with the technological edge needed to keep the company ahead of the competition in the Asian dairy products and milk powder market.

Find out more:
www.siemens.com/pcs7
E-mail: rajarshi.shome@siemens.com
As India’s largest paint company, Asian Paints operates 28 paint production facilities to serve customers in 20 countries. In 2003, the company decided to build the largest water-based-paint manufacturing facility, near Chennai. The plant was designed to produce 100,000 kiloliters per year.

Large-scale paint manufacturing is a complex batch process involving several product variants being made using parallel equipment, as Sameer Salvi, chief manager projects at Asian Paints, explains. “Flexibility, particularly in allowing users to add new recipes, was the major factor in selecting the automation system for this project. The modularity of the system and continuous support were other important criteria. Asian Paints also wanted to integrate automated manufacturing with its current ERP system, originally supplied by SAP.” After extensive consideration, Asian Paints opted for Siemens as a project partner. “The overall automation system offered by Siemens was technically superior to the others,” says Sameer Salvi. “All the hardware components in the automation scheme are being manufactured by Siemens. This gave a natural advantage to Siemens, especially with regard to cost. Perhaps most importantly, Siemens India enjoys the strong backing of Siemens Germany, which has been crucial in establishing successful PCS7 connectivity with the SAP ERP system.”

At the beginning of the project, Siemens outlined a distributed automation solution design based on the Simatic PCS7 process control system. The Simatic Batch add-on component was offered to manage the complexity of batch functions and to ensure a high level of flexibility in daily operations. Siemens also offered to integrate the ERP system with PCS7 and Simatic Batch.

Automation in the water-based-paint plant and the polymer block

A joint team from Asian Paints, SISL (Siemens Information Systems), and Siemens Germany implemented the system. The automation system in the water-based-paint plant comprises around 4,000 I/O devices (to be expanded later to 8,000 I/Os) being controlled by three (later six) PCS7 controllers. One of the controllers handles liquid raw material (the tank farm), the second takes care of solid raw material (powder additives), and the third manages the paint block.

All controllers are connected to a set of redundant operator station servers and redundant batch servers. Six PC-based operator station clients located throughout the plant and connected to redundant servers handle the operator interface and process control.

The tank farm and silo areas are connected using a fiber-optic ring network for...
Ethernet and Profibus. All other utility and auxiliary systems and machines in the plant are integrated with the main distributed control system (DCS) to generate production and maintenance reports. The system also communicates with energy meters in the electrical distribution network to gather information for energy consumption reports.

The interface between the automation system and the ERP system was created using the webMethods functionality of SAP and the API functions in Simatic Batch. A typical process flow involves creating a production order in SAP, which is downloaded via an SAP interface station to the automation system. Using parameters selected in the ERP system, a batch is automatically created and executed, with important batch data passed to SAP for reporting purposes.

The polymer plant automation system, which is currently being implemented, comprises some 1,500 I/O devices controlled by one PCS 7 controller and one set of operator stations and batch servers. Simatic ET 200iSP remote I/O devices, which are suitable for installation in Zone 1 hazardous areas, have been used to reduce cabling. The two systems are connected via Ethernet using the PCS 7 multiclient concept, which allows operation of both servers (paint block and polymer block) from all clients located in the plant, providing modularity without compromising functionality and precise control of temperature.

**Chennai sets example for other plants**

Sameer Salvi is very pleased with the performance of both the plant and the automation system. “The Siemens solution offers highly reliable hardware components,” he says. “So far, we have had zero hardware failures. We have great confidence in the solution. Additionally, we can rely on a highly experienced design, engineering, and commissioning team if any difficulties should arise.”

Asian Paints manufacturing facilities in Mumbai, Ankleshwar, Hyderabad, and Delhi also have automation solutions from Siemens.

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**Find out more:**

www.siemens.com/chemicals

E-mail: rajkumar.khanapure@siemens.com
Intelligent technologies for India’s water supply

Water for Growth

The face of India is changing rapidly – including in the area of water supply and wastewater treatment. The development of an infrastructure for water and wastewater is in full swing, both in the booming cities and in the provinces. Today, about 520 million people have no access to the public water supply. The water and wastewater industry is therefore an enormous growth industry. Siemens supports the rapid development of an economical supply and disposal system on the subcontinent with state-of-the-art technology.

Each year, thirteen million euros are being invested in India in sensor technology, measuring instruments, and systems in the field of process control and analytics in the water and wastewater sector alone. Experts are expecting an annual investment growth of up to 15 percent in the near future. In view of the increasing industrialization and population density, water consumption is projected to increase by more than a third over the next 20 years.

Precise control through accurate information

India is working on developing the most expansive water supply possible and relying on state-of-the-art technologies to achieve an economical utilization of the country’s increasingly valuable water resources. A major component of many of the current projects in the field of water supply is the setup of modern systems for requirement-based provision of water. In addition to the necessary electronic systems, this also includes the retrofitting of the existing pump stations and distributor systems with flowmeters that continuously measure the exact water throughput and therefore enable efficient process control.

For this, Siemens offers, among other instruments, the flowmeters in the Sitrans FUS series. These have been developed es-

Water for one billion people

- Population 1.13 billion
- Population density 343 people/km²
- Population without water supply 520 million
- Current water consumption 750 million m³
- Estimated water consumption 2026 1.05 billion m³
- Market for automation technology in the water industry 13 million €/year
- Annual market growth 10%–15%
especially for retrofitting existing pipe networks and can be installed by the so-called hot tapping technique without having to interrupt the water supply. These robust instruments, which have already been proven worldwide in tens of thousands of installations, are extremely reliable and require minimum maintenance. With their double-path ultrasonic technology, they supply exact measurements with an accuracy of plus/minus 1 percent of the measured flow rate.

Higher intelligence at a lower cost

Pumps can account for more than 50 percent of the energy costs in a waterworks. The intelligent pump control from Siemens ensures requirement-related use of the pumps by specifically exploiting the times in which the energy requirement is lower and the rates of the energy suppliers accordingly cheaper. Sitrans LUC500 ultrasonic level transmitters measure the exact level of the water reservoir and control the pumps so that they ensure trouble-free operation while at the same time making use of the cheap rate times where possible. This can save up to 10 percent of the operation costs.

Efficient wastewater treatment

An environmentally friendly water cycle includes the use of biological sewage plants for efficient wastewater treatment. Siemens has the complete know-how for this, including control technology and measuring technology for flow, level, pressure, and temperature as well as the latest analytical technology for monitoring quality criteria such as nitrate and phosphate content, conductivity, and turbidity.

The application of Siemens’ motto “Think global, act local” to the water and wastewater industry includes a specific technology transfer that unites global expertise with the skills of the local specialists.

Latest project highlights

A typical modernization project was recently implemented in the city of Mumbai. This international finance center with a population of 12.9 million decided in 2000 to equip its water pipe network with flowmeters to better understand the behavior of consumers and to be able to ensure requirement-related water supply. The Siemens flowmeters proved to be the optimum solution for retrofitting the existing pipe network. They can be installed easily by hot tapping, without having to interrupt the water supply. The authorities in Mumbai were clearly thrilled by the time-saving installation and reliable functioning of the solution and decided to use only these retrofittable Sitrans flowmeters in the future – for example, for the Pise & Panjarapor pump station, where the water throughput of a pipe with a diameter of 3 meters must be monitored.

A highly prestigious project was recently secured in the capital city of New Delhi. In this turnkey project, a total of 39 open-channel flowmeters MultiRanger 200, 26 multipath ultrasonic flowmeters SONO 3000, and 21 electromagnetic flowmeters MAG 3100 and MAG 5100W were delivered and installed ready for operation. As per the demand of the project, the multipath four-track ultrasonic flowmeters were calibrated at an independent laboratory in The Netherlands, and accuracy of 0.4 percent was achieved. The performance at the site met the expectations of the customer and resulted in additional orders for flowmeters.

Find out more:
www.siemens.com/water
www.siemens.com/processinstrumentation
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Simatic PCS7 in pharmaceutical production at Jubilant Organosys

Highly Available and Efficient

To create a redundant system environment, two controllers are normally placed next to each other and operated in parallel. However, with the event-based synchronization of Simatic PCS7, it is possible to use only one controller each in two production sections and to synchronize these to achieve a redundant and highly available solution. These advantages persuaded Jubilant Organosys to install Simatic PCS7 in a production plant in Nanjangud, near Mysore in India.

Highlights
- Simatic PCS7 V7.0 process control system
- 2 AS 417-4-2H controllers with fast ASIC processors
- Redundant system architecture with event-based synchronization
- I/O modules from the Simatic ET 200 series
- Robust Industrial Ethernet network solution
- User-friendly engineering tools for fast, easy configuration without extensive programming knowledge
- Hardware and software in accordance with IEC 61131
- Ready for FDA audit of the solution in accordance with 21 CFR Part 11
Jubilant Organosys operates in three key markets: pharmaceutical and life science products, chemical industry products, and high-performance polymers. The Active Pharmaceutical Ingredients (API) division of Jubilant Organosys develops and produces APIs under contract for well-known pharmaceutical companies located all over the world. The company, which was founded in 1982, is active in a variety of fields such as pharmaceutical research and CRAMS (Custom Research & Manufacturing Services) to target increasing global demands in the respective areas.

Jubilant Organosys has its headquarters in Noida, near Delhi, in northern India. One of the production sites at Nanjangud, near Mysore, comprises production blocks, pilot plant, and R & D. The flexibly designed multi product plants manufacture a number of APIs for customers in the United States, Europe, and the rest of the world.

Explaining the rationale behind opting for DCS in their new projects, Mr. N. Thyagarajan, head projects of API division, explained that the DCS was seen as necessary to achieve consistent quality in products and optimum raw material consumption, as well as to enhance safety in operations. Cost leadership in manufacturing becomes inevitable and more so in the context of pressure on profit margins caused by intense competition from other Indian and Chinese manufacturers.

In conjunction with an expansion of the capacity at the Nanjangud site, the company was looking for a consistent automation solution – among other things, for the efficient recovery of solvents and for the automation of the storage and transfer facilities for chemicals and solvents. The DCS is also of great help in troubleshooting plant performance because of reliable historical data of batch parameters.

Turning four into two

The company ultimately chose Siemens and the Simatic PCS 7 process control system; a decisive factor was the necessity for a redundant system environment for two plants standing 50 meters apart. Siemens installed two AS 417-4-H2H controllers, which are linked by event-based synchronization. This patented Siemens technology allows real standby operation with smooth switching within milliseconds, without both systems necessarily having to be near each other. In fact, the controllers can be installed up to 10 kilometers apart. The advantage for Jubilant Organosys was that only one controller was required for each facility, yet the necessary redundancy could still be ensured for unrestricted availability. Four controllers would have been necessary with a conventional architecture under the existing geographical conditions.

More information, more transparency, lower costs

With the help of PCS 7, Jubilant Organosys was able to implement a number of process improvements that have had a decisive effect on production costs, quality, and product safety.

The necessary solvents can now be used more precisely, for example, and a large share can be recovered and recycled in the process. In addition, continuous recording of all of the relevant process data enables not only rapid error analysis during servicing, but also clear tracking of quality matters.

Archiving takes place in accordance with the internationally recognized regulations of the FDA. On the whole, a more efficient and more transparent process control has been implemented, which features a high degree of flexibility and expandability, and allows the company to achieve higher productivity with fewer personnel.

Demand for standardization

The system at Jubilant Organosys is the first application of PCS 7 in the production of active pharmaceutical ingredients in India. The company was very pleased with the trouble-free partnership with Siemens, and views Siemens as its preferred supplier wherever automation technology is concerned.

The company also suggested that DCS suppliers work in tandem with pharmaceutical equipment suppliers to replace their custom-built PLC-based automation systems in equipment with DCS integrated solutions, which will lead to cost reduction, reliability, redundancy and standardization.
Safety Integrated with Simatic PCS 7 in India

Integrated Safety
With the Safety Integrated concept, Siemens offers a solution in which all crucial safety functions are integrated smoothly into the control system. The Indian company Chemplast Sanmar chose the advantages of Safety Integrated for the fail-safe control of a combustion furnace.

Chemplast Sanmar Ltd. is part of the Sanmar Group, a broadly based corporation with production sites all over India. Chemplast has its headquarters in Chennai, the capital of the Tamil Nadu state in southern India.

Chemplast’s Factory 1, located in Mettur, manufactures a coolant called M22. The by-product M23 is a known ozone-damaging gas and may not be allowed to escape into the atmosphere. The company therefore decided to eliminate this gas in a special combustion furnace that is fully integrated into the production process of Factory 1.

Production in Factory 1 is already controlled by an automation solution from the Simatic range. Siemens delivered this system about three years ago. It was therefore a logical decision to choose to control the combustion process with Simatic technology, but Chemplast also examined several alternative offers. The company that built the combustion furnace, Caloric Anlagenbau GmbH, left the choice of the automation solution up to Chemplast.

Low-cost safety without compromise
The process safety of the furnace was a critical issue because the factory is quite close to housing estates. Chemplast therefore required a fail-safe, state-of-the-art control system that would automatically shut down the furnace in the case of an incident. The system must, of course, comply with international safety standards such as SIL 3 and IEC 61131 and be tested according to the appropriate TÜV standards. Chemplast also makes significant demands on all the services connected with the control system. The company wanted a technology partner that could ensure extensive local support and that would be able to react quickly and at low cost in the event of a problem, for example.

Safety Integrated is the best answer
Siemens immediately realized that this was the ideal application for a process control system with integrated fail-safe technology and therefore suggested Simatic PCS 7 with Safety Integrated. The key feature of this solution is that all the safety functions are transmitted on the same network infrastructure as the standard functions. Safety-relevant signals can be transmitted parallel to regular communication with the Profisafe profile on the standard Profibus DP bus systems.

In a conventional configuration, in contrast, two completely separate systems are used – one for the distributed proportional-integral-derivative (PID) control and an additional fail-safe system especially for the safety-relevant functions. Safety Integrated therefore already offers cost advantages at the hardware level by using fewer components and requiring less installation effort. The Siemens system integrator Vasundhara Automation was also able to ensure round-the-clock service and therefore met the customer requirement of low-cost local support.

Safety Integrated as the decisive element
Safety Integrated proved to be the decisive element in the Siemens solution and ultimately gave Siemens the edge over all its competitors. Not only the initial investment but also the total cost of ownership was well below all conventional solutions. The costs for engineering, maintenance, and training were also much lower – not to mention the space saved in the control center by not having to install two parallel systems because the operating and engineering stations for the process control and the entire safety functionality are combined in a single system.

Of course, such an innovative concept as Safety Integrated had to come with convincing arguments. Siemens therefore placed great emphasis on maintaining close contact with the decision makers at the beginning of the selection process. This included, for example, a special presentation at which those responsible for the technology at Chemplast Sanmar were introduced to the functionality of Simatic PCS 7 and the Safety Integrated concept was demonstrated in detail. Siemens also presented the concept to Caloric Anlagenbau GmbH to ensure good collaboration with the system manufacturer.

The first process control system with Safety Integrated with PCS7 in India casts Chemplast Sanmar in the role of technological pioneer.

Find out more:
www.siemens.com/process-safety
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Indian cement customer reinforces its trust in Siemens’ expertise

A Solid Bonding

Success is in many ways a positive and fulfilling experience. A series of such positive experiences reaffirms one’s faith in a business relationship, and also serves as the most reliable source of recommendation. The partnership between Vasavadatta Cement and Siemens has successfully overcome a variety of challenges, prompting Vasavadatta Cement to rely on Siemens technologies and services for the further expansion of its factory.
The Vasavadatta cement factory is the second greenfield project of Kesoram Industries, which is a diversified Indian corporation that is active in the production of cement. In addition, the group also holds diverse interests in the fields of tires, rayon, transport, paper, spun pipes and chemicals. The Vasavadatta Cement factory in Sedam, situated in the province of Karnataka in southwest India, has been producing ordinary cement as well as very high-quality pozzolana cement since the mid-1980s.

The market liberalization and growth experienced by the Indian building and infrastructure industry prompted a rapid expansion of Vasavadatta Cement factory, and a second production line was added in 1997 followed by a third line in 2006. To keep pace with the booming economy and the huge demand from the infrastructure sector, a fourth line is already being planned. Siemens, which has been working with the company since the beginning, was once again contracted to develop, install, and commission the entire automation system in addition to the necessary drives for the construction of the latest production line in Sedam. The third production line has set new standards for the Indian cement industry in many respects. The mill can process up to 1,500 tons of limestone per hour and is therefore one of the largest plants of its kind in the Indian subcontinent. Its double rotator hammer and the energy-saving roller technology in the coarse and fine mills are state-of-the-art installations.

Building on a good relationship

The automation of the second production line of the Sedam cement factory, which went into operation in 1997, worked to the owner’s full satisfaction from the very beginning. Siemens therefore made a good impression on the management of Vasavadatta Cement. In the course of a relationship that has spanned over 20 years, Siemens has not only provided excellent services for building and commissioning and offered the latest technologies, but also offered comprehensive support throughout. On one occasion, when the entire electrical system of the factory caught fire, the technicians from Siemens were on hand immediately; they also gave a demonstration of the sophisticated Siemens escalation management approach and made sure that the factory resumed full production within 20 days.

It was this series of positive experiences that ultimately convinced the management of Vasavadatta to rely on Siemens again for the third phase of the factory’s expansion. In the third line, only the latest control and automation technology has been used. Siemens has installed its Cemat system, designed especially for the cement industry, together with the latest version of the Simatic PCS 7 process control system for the first time in India. The distributed control system is based on a robustly designed architecture of several S7-416 controllers. These are connected by a 100-megabyte-second glass fiber Industrial Ethernet with ring topology. This ensures faster data exchange and a highly available system architecture. Approximately 10,000 sensors and other peripheral devices and measuring instruments are installed at the fieldbus level throughout the factory. They are connected via Profibus to several switch cabinets, which communicate with each other via a glass fiber network that is also designed as a ring network in the critical areas. The finish raw grinding mill has an absolute state-of-the-art design and is the first plant of its kind in India. Its function was also automated with PCS 7 and integrated smoothly into the overall system. The tools contained in Cemat ensure optimum operation of the furnace in all respects. Several frequency-controlled drives were integrated into the control system via Profibus DP, as were other subsystems such as the gas analysis instruments and the weighing system sensors.

Further projects being planned

This joint Vasavadatta and Siemens project was also completed on schedule. The process control system went into operation as planned in January 2007, and the new production line is now working at full capacity. The development of the Indian building industry signals continuing growth, and experts are expecting an increase in cement demand of 8 to 10 percent per year over the next few years. Vasavadatta Cement is therefore already planning a fourth production line, which will also be equipped with Cemat. And thus the relationship between Vasavadatta Cement and Siemens continues.

Highlights

- First application of Cemat and Simatic PCS 7 in the Indian cement industry
- Highly available, redundantly designed system with S7-416 controllers
- Industrial Ethernet with glass fiber wiring in ring topology
- Linking of 10,000 I/O units and subsystems via Profibus
- Networking of switch cabinets via glass fiber ring network

Find out more:

www.siemens.com/cement
E-mail: santosh.a@siemens.com
Schwing-Stetter was established in 1934. In 1974, the company from Herne, Westphalia, Germany, founded a subsidiary in the United States and in 1999 also set up as Schwing-Stetter India Pvt. Ltd. on the Indian subcontinent.

Schwing-Stetter is well known for its expertise in the field of concrete manufacturing. Its product range includes everything from concrete pumps and concrete mixer trucks to entire factories for the manufacture of ready-mixed concrete or pre-fabricated concrete parts.

India as a growth market

Schwing-Stetter runs three production sites in India, for prefabricated concrete parts, concrete mixer trucks, and concrete pumps. The company has benefited greatly from the rapid expansion of the infrastructure in India and is expecting growth of up to 40 percent over the next five years. A typical feature of the Schwing-Stetter plants is their high degree of automation. The company uses Siemens automation components exclusively.

Anand Sundaresan, managing director of Schwing-Stetter India, sees a quite logical reason for this relationship with Siemens: “When we started in India in 1999, we were looking for partners with a global presence that were able to support our rapid growth. Siemens is not only able to meet our constantly growing demands but can also provide worldwide service and support.”

High tech with easy operation

Schwing-Stetter uses the Simatic S7-300 controller series for the automation of the plants. Integrated features such as process documentation, storage of customer and job-related data, and statistical evaluations have proved extremely helpful in ensuring the timely procurement of the necessary materials and guaranteeing a consistent quality.

Concrete must satisfy specific quality criteria in different areas of application. It is therefore very important to be able to switch between the different recipes quickly and easily during production. This is where the WinCC user interface in connection with the Siwarex weighing technology shows its full strength. It allows trouble-free recipe management, which even the less skilled workers from rural India can handle without any problems.

Cutting-edge technology and easy operation – these are the features that are ultimately responsible for the success of the Schwing-Stetter systems on the Indian market.

Find out more:

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Siprocess microprocess system proves effective at Lonza

Safe and Stable

Lonza is the leading provider of customer-specific syntheses of pharmaceutical ingredients and intermediate products. Lonza makes use of innovative process technologies such as microprocess technology and has worked closely with Siemens for many years. Lonza has recently been using the Siprocess microprocess system. We spoke to Dr. Dominique Roberge, project manager for microreaction technology at Lonza, about his experience with this system.

Dr. Roberge, how do you assess the benefits of microprocess technology for the requirements of your company?

Dominique Roberge: We evaluated the Lonza processes in a systematic study. The results showed that between 5 and 10 percent of the processes currently running are suitable for microprocess technology. There are also certain chemical reactions, such as nitration, which can only be achieved at a reasonable expense in microreactors.

What is your experience with Siprocess in the field of exclusive synthesis?

Dominique Roberge: We are constantly receiving new inquiries, which often include reactions that are associated with certain safety concerns. The Siprocess microprocess system is based on the leading process control system, Simatic PCS7, with integrated warning and monitoring functions. This enables us to run safe, robust chemical reactions for the production of kilogram quantities of fine chemicals in 24-hour operation, which is not possible in manual mode. At the same time, the automation software is widely accepted by our lab technicians who work with Siprocess, thanks to its ease of operation and practical archiving functions.

How important are the modularity and flexibility of Siprocess for you?

Dominique Roberge: The modularity allows us to adapt Siprocess to our requirements very quickly. The open, modular structure offers a great degree of flexibility. We can, if necessary, also integrate our conventional laboratory equipment into the hardware and automation at the same time. This triples our efficiency, which gives us a clear competitive edge.

Dr. Roberge, thank you for speaking with us.

Find out more:
www.siemens.com/siprocess
E-mail: sales.siprocess@siemens.com

Main benefits

- Significantly improved mixing and heat transfer performance
- Higher yield, lower energy costs, and lower hold-up

These advantages are particularly effective in:
- Organometallic chemical syntheses such as the production of organo-lithium compounds or nitration;
- Gas-liquid reactions such as partial oxidations, sulfonations, sulfidizations, ozonizations, and fluorinations;
- Processes where the material properties of the products depend strongly on the synthesis method (for example, polymerizations; crystallizations; emulgations in fast, mixture-sensitive, heavily exothermic processes), and safety-critical processes.

CASE STUDY
Process Technology

Visp is Lonza AG’s central production site for chemically synthesized products

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Dr. Roberge, thank you for speaking with us.
As a traditionally conservative industry, the process industry places great emphasis on tested solutions and has always been skeptical about introducing new technologies. It therefore took some time before fieldbus technology was able to establish itself in the process industry. However, the benefits of this technology (compared to classic analog interfaces), such as wide bandwidth, low wiring costs, and flexible topologies, were ultimately compelling, and bus systems such as Profibus are widely used today.

Especially where Profibus is already installed due to the use of a process control system such as Simatic PCS 7, it is only logical to use the capabilities of the fieldbus technology for other tasks too. Efficient distributed I/O systems can transmit large amounts of valuable information to the master control system via Profibus. This information can be used, for example, in supporting commissioning and maintenance, and therefore offers a clear additional benefit.

The introduction of the Profisafe profile added fail-safe communication to fieldbus technology's area of application. Especially when bus wiring already exists for the standard application at the field level, the uniform linking of fail-safe circuits brings considerable cost advantages in comparison with conventional transmission, if ap-
Profisafe systems generally incur a certain extra expense due to the more complex software on the slave and the master system, but the effects on response speed, especially in fail-safe applications in the process industry, are negligible because the typical application is for switch-off tasks. One example of this is limit-value switches for fail-safe applications in the PLC, which switch off valves or pumps in the case of faults. Such hard operations are not performed in the millisecond range, so the bandwidth reserves of the bus technology are far above the actual requirements.

First fail-safe device for Profibus PA

In parallel with the development of the Profisafe profile, Siemens, as one of the Profisafe technology leaders, also pursued the development of fail-safe process instruments for Profisafe. With the Sitrans P DS III PA pressure transmitter, Siemens presented the world’s first fail-safe process instrument for Profibus some time ago. The Profisafe variant is based on a standard pressure transmitter that has been proven in operation and available on the market for years. It was originally designed as a SIL 2 device and not developed specially for fail-safe technology. Up to SIL 3 can be achieved by redundant diversitary design or appropriate extra effort in diagnostics.

Sitrans P DS III

With Sitrans P DS III, Siemens presents a new pressure transmitter that introduces a new generation of fail-safe field devices for fail-safe applications:

- Communication via Profibus DP with the Profisafe protocol
- Mixed operation of Profisafe and Profibus PA devices on the same bus
- Reliable data integrity due to extensive security mechanisms such as the cyclic redundancy check and watchdog function
- Fail-safe up to SIL 3
- Advancement of a globally proven standard transmitter with a large installed base
- Parameterization via Profibus, HART, and locally on the device

This first Profisafe process instrument is the first representative of a totally new generation of process devices. Siemens will also equip other transmitters with Profisafe drivers in the future and will develop new devices to meet SIL standards from the beginning.

SIL on the rise

Many users are now demanding appropriate SIL certificates in invitations to tender, even if only a few measuring points are actually related to safety. In view of this trend toward uniform requirements, Profibus PA and Profisafe offer further advantages because they support the standardization of process instrumentation. Fail-safe and conventional measuring points can be equipped with only one device type. Fieldbus technology will therefore continue to establish itself, as the market potential basically corresponds to the number of fail-safe measuring points. Their share as a percentage of all process instrumentation depends on the industry sector and ranges from 5 percent in chemical plants to almost 100 percent in the oil and gas industry.

Find out more:
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Simatic technology in high-precision dosing system

Accurate to the Tiniest Dose

Ludwig Schwerdtel GmbH has developed a new dosing and mixing system that allows highly accurate mixing of different components, thanks to a sophisticated mechatronic solution. The company relies on cutting-edge equipment from Siemens for the control and drive technology.

Schwerdtel in Karlsfeld, Bavaria, builds machines and systems for conveying, dosing, mixing, filling, and packing substances that range from liquid to very highly viscous. The company has concentrated on two types of containers: cartridge and vessel filling. About 50 percent of sales are in the sealants sector, 25 percent in printing inks, and another 25 percent in specialty machines.

The Karlsfeld-based company recently launched the new XKV machine series, which sets new standards for dosing accuracy, modular upgradability, the possibility of just-in-time production, self-cleaning
of the mixing system, and ease of operation. A system has been created in which the mechanics, electronics, and software work together with optimum efficiency. The basic structure of the machine series was implemented with an open section design providing adequate rigidity while permitting access to all components.

After the basic ingredients are fed in, they are conveyed into a dosing cylinder, which presses the material into the mixing chambers. Up to six components can be mixed in per mixing chamber (with star-shaped design). By adding a second mixing chamber, up to 12 components can be mixed. The highlight: customers can gradually expand their systems with one to twelve additional components. Adaptation to customer requirements is possible at any time.

Exactly dosed and mixed ...

The additional components are fed in by precision-controlled injection nozzles. This accuracy is achieved by, among other things, a measuring device that transmits 215 pulses per millimeter of liquid and therefore enables an extremely exact recording of partial quantities. The injection mechanics also have highly accurate adjustments. The injection is performed by pneumatic cylinders because of the highly dynamic action required. To ensure precise positioning, the cylinders move against adjustable stops. These stops are set exactly to a thousandth of a millimeter by Simodrive Posmo A servo motors. "This increases the dosing accuracy to an error of 0.3 percent of the volume," says Reinhold Walther, head of development mixing technology at Schwerdtel.

The added components must then be mixed as uniformly as possible with the base material. This is done with static mixers – flow-deflector plates in a complex layout that mix the substance intensively as it flows through. The mixer itself has no moving parts. This design works so well that, for example, an amount as small as 0.03 milliliters can be mixed totally uniformly in a cartridge of 315 milliliters.

The entire system is also self-cleaning. Bernhard Stoll, managing director of Schwerdtel, says, "The machine cleans itself within a maximum 10 strokes when changing a color or component. It no longer needs to be cleaned." Production of a new product can begin immediately after these 10 "empty strokes." This enables just-in-time production. Since the machine sets itself automatically to every recipe and cleans itself, very small batches can be produced. Intermediate storage is unnecessary or drastically reduced. In addition to the dosing accuracy, the dosing quantity can also be adjusted in very wide ranges: from 0.01 to 15 volume percent (XKV variant) so that thousands of recipes can be implemented.

Implementing all these functions requires an appropriate electrical equipment complete with controller, bus system, and drives. Here, Schwerdtel relies to a great extent on Siemens. "First of all, the systems meet our functional requirements, and, second, Siemens is present in all the important markets so that spare parts supply is ensured abroad as well," explains Bernhard Stoll.

A Simatic CPU 317-2 DP is the core component of the system and features high performance, a simple structure, and efficient engineering. Programs are created with Step 7. All communication takes place via Profibus DP. A touchscreen version of the Simatic Multi Panel allows all inputs to be made easily and shows all necessary displays. The ease of operation was decisive for Schwerdtel.

The intelligent, distributed Simodrive Posmo A drive motors are also connected via Profibus. These motors carry their converters piggyback. This provides a very compact total drive for positioning tasks, requiring little room in the switch cabinet, small cable ducts, and minimal wiring effort. Up to six motors are used per dosing head.

The entire system can be connected to customer networks via an Industrial Ethernet interface with a CP 343-1. Remote diagnosis of the machine via modem is also possible. The recipes are archived on a memory card that can store hundreds of recipes. Another advantage that is not to be underestimated is the self-learning function of the software. The various machine parameters optimize themselves automatically during production, in relation to the product to be filled. These data are saved with the recipes so they are available the next time the recipe is called. The machine then starts immediately in the optimum performance range after the learning phase.

Schwerdtel already has eight of its new machines in operation at customers’ sites. The positive feedback has encouraged the company to supply other areas of application, such as the food industry. Even more complex machines will be built for this purpose.

Find out more:
www.siemens.com/s7-300
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ProMinent Dosiertechnik AG is a family-owned company with 1,700 employees in 43 branch offices around the world. The main line of business is diaphragm dosing pumps, which are used in virtually all industries. ProMinent also supplies the plant engineering market with systems for ozone and UV water treatment, as well as flocculation, preparation, and dosing systems for water-treatment units. ProMinent produces and installs both individual components and entire customer-specific packages complete with storage tanks and panels, including the dosing pumps with fittings, dosing and purge pipes, and the appropriate electrical cabinets.

**Growth in package unit business**

One of ProMinent’s subsidiaries is in Regensdorf near Zurich in Switzerland, where systems are built and sold primarily for the Swiss market. Werner Altherr, technical manager at the Regensdorf facility, stresses the importance of the package unit business: “A stand-alone pump is almost impossible to sell on the saturated Swiss market because the customer can order it anywhere. You have to offer a complete package unit!” ProMinent already achieves about half its sales in Switzerland with package units, 35 percent through the series product business, and about 15 percent with maintenance and after-sales service.

**Tailor-made solutions for different requirements**

Based on the efficient dosing pumps, ProMinent develops a solution for every dosing task, designed to meet the special requirements of the customer. For example, a dosing pump with the appropriate valves and pipes can be offered either with or without Sitrans technology enables exact dosing in water treatment

**The Right Ingredient**

Exact, reliable dosing systems are the trademark of ProMinent Dosiertechnik AG. Wherever particularly high dosing accuracy is required, Sitrans flowmeters support the precision dosing pumps in their work – for example, in the Werdhölzli wastewater treatment plant in Zurich, Switzerland.
external flowmeter, depending on the degree of accuracy and the additional information the customer demands. Altherr says, “With less demanding applications – for example, a normal flocculant dosing – the dosing accuracy of the dosing pump is sufficient.” The ProMinent Delta dosing pumps, with their innovative OptoDrive technology, already achieve a high degree of accuracy.

Wherever high dosing accuracy, exact flow volumes for logistics and ordering, or documentation of the dosed amounts as proof of quality are required, ProMinent complements the installation with an external flowmeter. The company prefers to use Siemens Sitrans devices because, according to Altherr, “the Siemens devices suit the ProMinent system design well. The whole package unit has a vertical structure, primarily for ergonomic reasons. The combination of the Sitrans FM MAGFLO MAG 6000 transmitter and the Sitrans FM MAGFLO 1100 sensor can also be installed vertically so that the digital display can be read without tilting one’s head. This is very important to us. But the Siemens devices are also a good choice as far as their price/performance ratio and acceptance in the market are concerned.” For applications that demand particularly high dosing accuracy, ProMinent has recently been relying on Sitrans FM MASSFLO mass flowmeters. “We use the MASSFLO devices, for example, for dosing additives in post-pellet applications in the animal nutrition industry or for special dosing tasks in detergent production,” says Altherr. “Here, the dosed substances are either very expensive or the amount added must be exactly documented. But we have also installed the MASSFLO devices in a dosing system for methanol – and the devices work perfectly.”

Dosing system in stainless steel
One of the current highlights, in Altherr’s opinion, is the methanol dosing system for the Werdhölzl wastewater treatment plant, in which the internal return water from process sludge with a high nitrogen load is purified separately in a newly constructed return-water treatment system with a sequencing batch reactor. For reliable contaminant elimination, methanol is added as a carbon source for the microorganisms. A ProMinent dosing system was recently installed for this task. Since methanol can form a flammable mixture with air, the whole unit is in Ex zone 2 or, directly in the housing, in zone 1. The dosing system is made entirely of stainless steel and is equipped with two dosing pumps and two mass flowmeters. Sitrans FC MASSFLO MASS 6000 mass flowmeters and Sitrans FC MASSFLO MASS 2100 sensors, both in the stainless steel version, are used.

Positive review of outcome
Since commissioning, all systems have been working to the full satisfaction of the customer and ProMinent. Altherr is pleased with the results of the project design of the unit for Werdhölzl and draws a positive conclusion: “The collaboration with Siemens is very good, as is the support from our sales partners at Siemens. The products are excellent and offer clear advantages, especially as far as the installation possibilities are concerned.”

Find out more:
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Café Iguaçu benefits from automation with Simatic PCS7

Perfect Taste

Companhia Iguaçu de Café Solúvel, a Brazilian instant-coffee manufacturer, is already benefiting from its investment in the automation of the extraction process. The new extraction line IV, automated with Simatic PCS7, went into operation last November. Improvements in performance have been even greater than expected.
The new automation solution is one of the most complex applications ever to be implemented in Brazil (as well as worldwide) by a coffee producer. It was an immense project, even for Café Iguaçu, which has been producing instant coffee for 39 years. A new extraction line was implemented to increase the overall production volume, and the efficiency of the roasting plant and the concentrator also had to be increased for this purpose. The company wanted a high degree of automation and installed exclusively state-of-the-art technology.

Extensive requirements
Extraction involves both continuous and discontinuous processes, which makes automation very complex. “The number of valves and possible combinations is almost infinite. Converting this into a software solution was a great challenge for the process engineers,” says Hugo Djalma Luz, sales manager at SHW, the company responsible for implementing the solution.

“We looked at the hybrid systems of numerous providers and finally chose Simatic PCS 7 because it offers convincing options for automation networks and control hierarchies,” reports João Eduardo Carvalho, one of the project engineers.

Broad framework
The first components of the project were implemented in December 2004. This phase included two redundantly operating servers, the networks for the user interfaces, and the AS networks. The first machine, the APV concentrator, was commissioned in February 2005.

Extraction line IV went into operation in November 2005. “We have also integrated extraction III and two roasting machines into this semiautomatic process in the meantime,” Carvalho says. The system architecture consists of approximately 200 Profibus PA devices and more than 800 ASI slaves; the devices on the Profibus network measure pressure, temperature, and degree of concentration parameters while the ASI network links the discrete input and output devices. Four Simatic AS 416-3 automation systems control all the processes in production: one system is intended for extraction IV, the second for the other extractions, the third for the concentrator, and the fourth for the roasting plant. Carvalho says it was very important that the automation take other sections of the factory into account in this phase of implementing the extraction line and the concentrator.

Today, parts of extraction lines I, II, and III are automated. The roasting plant is still using the SCADA system. Other concentrators are to be automated by next year.

Increased production capacity
The major advantages of the new solution include better reproducibility and extensive diagnostic and monitoring functions. The automation has greatly increased the company’s efficiency.

“The system allows an increase in productivity without causing quality problems,” explains Eduardo Morales, production engineer at Café Iguaçu. “Our production process was completely manual and depended a great deal on the machine operator. We were also missing necessary information. There were some deviations in the production sequence that we could not explain. The process is now more transparent, and we get the necessary information in real time so that we can immediately see which production stage the product is passing through at the moment. We can improve the quality of our products at the same time.”

Superior information management
Another advantage of the automation was that it also simplified the implementation of a plant information management system. Café Iguaçu uses the Simatic IT Historian component for this. The system collects the data from all company departments in a single central database and places them at the disposal of all company users via Client Tools. In addition to the automatic data generation, a manual data-entry application was developed that makes the use of handwritten notes completely superfluous.

The production department knows exactly which raw materials and machines are to be used for which products in production. The machines are programmed according to the product properties and can be adapted by the machine operator as necessary.

A total success
The machines at the Iguaçu factory in Cornélio Procópio will produce 16,500 tons of instant coffee this year. “The automation enables us to visualize all the process variables and to control the production process more efficiently. Extraction IV has not produced any substandard product to date,” says Morales.

Find out more:
www.siemens.com/food
E-mail: ruediger.selig@siemens.com
Level-monitoring technology helps brew a great cup of coffee

Instant Readings

Instant coffee is produced by extracting liquid coffee from roasted, ground beans. The mixture is spun in a centrifuge to remove water and any residual coffee grounds left after filtration, and then spray-dried to make the granules in the jar. During this process, level monitoring is critical. Siemens technology helped solve a challenging measurement solution in the process recovery tank.

Coffee has a high commodity value, so it is important to extract maximum flavor from the coffee beans. Situated below the centrifuge is a 4,000-liter stainless steel tank that fills with water heated to 60 degrees Celsius. When the water reaches a set level, a valve opens to inject the coffee solids collected by the centrifuge.

The rapid changes in tank contents must be tracked reliably, as overfilling means costly spillage and can block the inflow from the centrifuge. Underfilling is inefficient and creates wear and tear on equipment. The measurement system must be able to measure reliably through steam vapor and withstand high process temperatures as well as the frequent cleaning-in-place (CIP) process. There is also turbulence from the sudden injection of the coffee solids into the tank, and the stirrers create electrical “noise” that interferes with some measurement technologies.

Ultrasound solution

Recently, the plant operators conducted a trial with the Sitrans Probe LU transmitter. The tank is also equipped with a Pointek CLS 200 capacitance probe, which acts as a high-level fail-safe switch to stop the process if the tank overfills. The patented Sonic Intelligence signal-processing technology of the Sitrans Probe LU differentiates between true and false echoes and can consequently eliminate signal interference from stirrers in the recovery tank. The Probe LU is easy to install and can be programmed without opening the lid, using the patented infrared handheld programmer. The transmitter face is made of PVDF to withstand the daily CIP process.

Significant benefits

The Probe LU is integrated into the SCADA system. Based on the level readings, the system controls the recirculation and removal of liquid from the tank. When it receives an “empty” level signal, the system initiates the CIP process.

The ultrasonic transmitters have performed beyond expectations. The Sitrans Probe LU provides the operator with a continuous reading of the level in the process tank, despite the agitation, recirculation, foam, and water vapor. This allows the operator to control the process effectively. It also eliminates overfill and underfill conditions, which could lead to costly downtime in production.

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To illustrate the benefits of a true real-time PAT solution for the pharmaceutical industry, Umetrics and Siemens are giving a comprehensive PAT seminar at several locations in the USA and Europe. The seminar will share knowledge, case studies, and experiences of PAT and include the demonstration of real-time PAT applications and illustrate how to implement a PAT solution to increase quality and process understanding.

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