Setting a course in Colors

Successful Simatic PCS 7 pilot project at BASF in Germany

Using the Siemens Simatic PCS 7 process control system, implementation of the automation system at BASF’s polystyrene plant in Ludwigshafen has been successfully completed. The conversion of the plant began three years ago and took place in several phases while production at the Ludwigshafen plant continued. PCS 7 did not only integrate all sub-sections of the plant in one process control system but offers an interface between company management level and production. Thus creating greater transparency and efficiency.

BASF is one of the world’s largest chemical companies, with plastics and fibers being among the biggest selling segments of the successful global player. In order to be able to react more efficiently and flexibly to the increasing demand of customers for special-

ties, BASF has restructured its plastics division in recent years. By concentrating the dyeing of polystyrene specialty products at the production site in Ludwigshafen, BASF wanted to reduce production costs, enhance plant flexibility and ensure high product quality in the long term. This also meant refurbishing the automation system of the two large production plants in Ludwigshafen. “The challenge to this problem was that we had to perform a “hot” conversion during operation. For economical reasons, a production shutdown was totally unacceptable”, explains Dr. Rainer Moors, Deputy Manager of the polystyrene factory. With the Simatic PCS 7 process control system, convincing project expertise and a dedicated team, Siemens had excellent credentials for the job.

Connecting worlds: Simatic PCS 7

For Eduard Reinschüssel, plant automation manager in this project, the decisive arguments in favor of PCS 7 were flexibility, uniformity, openness, redundancy and the capability to integrate third-party systems. The Windows-based interface made it easier for the operating team to get accustomed to the system. Since the operating stations of PCS 7 can be used for a broad variety of applications, the laboratory could also be included into the new solution. Different servers are dedicated to different plant units, so that each unit can be operated independently. The access authorizations are also designed specifically for operation of certain sections of the plant.

Successful pilot application

From the plant communication right up to the servers, the system is completely redundant in order to boost plant availability and to ensure that simple faults do not lead to a production shutdown. As there was no experience with redundant operation available at BASF at the time the contract was awarded, both BASF and Siemens were aware of the risk involved in the pilot application decision. Yet,
after several months of daily operation, it became evident that choosing fully redundant systems at BASF for the very first time has been the right decision.

Distributed remote I/O systems monitor several thousand I/O in the plant. The sensor and actuator signals are transmitted to the automation systems by the Simatic ET 200M modules in the control room. Fully redundant AS 40 automation systems are at the core of the new process control system. The permanent synchronization of the two sub-systems guarantees that the reserve system can take over without delay.

Customized adaptation

In the monitoring rooms, sophisticated process visualization makes sure that the operators have full control over plant performance. Diverse components and subsystems such as surveillance cameras, variable speed drives and weighing systems are integrated into a single automation solution. This results in both a comfortable HMI and uniform engineering. One engineering station configures and documents the entire automation equipment. All information from the process control system is recorded and evaluated by an operating data information system and can be used to analyze the operating processes so that the automation level is vertically connected to the plant management.

One of the most important tasks of the project was the integration of laboratory and production automation. Recipes, production and quality parameters form a common database. With PCS 7, BASF has the possibility to use the process data feedback for quality assurance and make historical data and the recipes management system available to laboratory and production processes.

Challenging complexity

The size and complexity of the plant require an automation system that can accommodate changing market and production demands. During the three-year project implementation, plant design was modified several times – and all these changes had to be incorporated in the control system. Simatic PCS 7 meets these requirements easily so that the process and plant enhancements parallel to the project could be easily implemented.

And last but not least, the excellent cooperation between the project teams of BASF and Siemens also made a decisive contribution towards achieving the ambitious goal of converting the plant during production. Rainer Moors and Eduard Renschschüssel both agree that this exemplary cooperation was decisive for the project’s success.

In the meantime the work had been successfully completed and the plant is working perfectly. The final fine-tuning stages has been completed successfully by mid-2002. The good cooperation of BASF and Siemens is presently being continued in the Tefuran plant in Ludwigshafen.

For the modernization of the polyester plant at the Oberbruch Factory, TWD’s main goal was to improve the control and handling of production and at the same time reduce plant personnel requirements. With its excellent price-performance ratio and the consistent use of the field bus technology, the Siemens concept with the Simatic PCS7 process control system and Profibus PA was able to convince the engineers at TWD. Thanks to the simple handling of the new control system, the implementation was carried out quickly and without any problems.

The TWD Polykondensation GmbH is a subsidiary of the TWD Textilwerke Deggenhorst GmbH, which produces the high quality thread brands such as Biolen and Timbrelle, just to name a few. The factory at the Oberbruch location manufactures about 100,000 tons of high quality polyester granulate monthly for various textile and technical purposes, relying on the latest technologies to conserve resources and the environment and to guarantee a very high standard in production quality.

The production plant of the TWD Polykondensation consists of 14 production lines with autoclave and transesterification units. A master distribution system manages the adding of the important catalysts and the dimethylterephthalate (DMT) and glycol input, which are the main synthesis components. Until recently the plant was controlled by conventional MSR systems with a relatively large number of personnel. These systems were to be replaced by an efficient process control system to reduce the personnel requirements of the plant and increase flexibility in production. The new system should provide a modern foundation for the acquirement and archiving of production and quality data and support an interface to the SAP system of TWD Polykondensation.

In addition, TWD required that the entire modernization should take place during running production. Therefore, the entire project was to be conducted keeping to a tight and strictly defined schedule, converting the plant and setting up the interfaces to existing systems step by step, gradually replacing the old components.

Together with the local company R&M HIMA, Siemens was able to secure the contract for modernizing the plant. One of the main arguments in favor of the Siemens-HIMA Team was the fact that R&M HIMA was very familiar with the processes in the plant from its service work for TWD in Oberbruch and was able to guarantee that the deadlines were to be kept in all cases. Moreover, the solution based on the Simatic PCS7 process control system offered a potential for saving about 400,000 Euro by linking the field devices via the Profibus PA field bus system, and that was something competing suppliers could not offer.

Easy commissioning

During the implementation, which took place in four phases, the combination of Simatic PCS7, Profibus PA and optical Fast Ethernet scored many points with its simple handling. The parameterization and diagnosis of the process devices is performed directly from the central engineering station and the integrated engineering of all components saved a lot of time and money during commissioning. The training courses were also used to optimize all processes prior to commissioning before the programs for the individual production lines were copied. The fine-tuning of the procedures, operating masks and data entry systems was done on-site during commissioning.

Due to an earlier than expected plant downtime, the pair of lines planned for March 2002 could already be put into operation in May 2001 together with the safety test of the reactors, 10 months earlier than originally intended. This meant that TWD was able to benefit from the personnel savings thanks to automtatation of all production lines much earlier than anticipated.

Advantage through flexibility

With the new control system, production can now adapt quickly to new or modified parameters and recipes. PCS 7 is also able to control the plant’s processes much better, and the extensive diagnostic and analysis functionalities of PCS 7 and Profibus PA enhanced process reproducibility, increasing product quality significantly. With PCS 7, production is now able to get by with less personnel. Moreover, the old system required manual interventions, some of which had to be performed in Ex-hazard areas. Now the operator can control all processes from the control station via the click of a mouse.
In the world's most modern water paint production facility at Wuppertal, DuPont Performance Coatings is constantly searching for new strategies to make their processes even more efficient, reliable and secure. A special task force was set up to compare the field devices of several suppliers to find the optimum solution for pressure and temperature measurement. Sitrans P and Sitrans T from Siemens made such a convincing impression with their ease of use, advanced diagnostic features and excellent communication abilities that DuPont at Wuppertal decided to standardize on these devices for temperature and pressure measurement.

Precisely 200 years ago, French immigrant Etienne Irénée du Pont founded DuPont in Wilmington, Delaware. From the very start, DuPont was a science company, delivering science based innovations in such fields as food and nutrition, health care, apparel, home and construction. Since then DuPont has expanded and diversified. Today, DuPont is represented in 65 countries employing more than 83,000 employees. Their product range encompasses such famous brand names as Teflon, Lycra and Kevlar.

DuPont’s largest plant is located in Wuppertal, Germany. As part of DuPont Performance Coatings (DPC), this plant produces refinish and serial paints for automobiles, serial paints for industry and plastics and pigments for DuPont’s own processes. In addition, DuPont Wuppertal is the world’s most modern water paint production facility. Not only is the plant fully automated, it is also environmentally friendly. Using uniquely automated material handling techniques, where holding vessels are physically moved through the process, you cannot see nor smell the paint in this facility.

Strategies to boost productivity

In applying DuPont’s approach to increasing productivity to process instrumentation, a PTFL working group (Pressure, Temperature, Level and Flow) was formed in the summer of 2001. Its task was to study the current suppliers of process instrumentation at DuPont. In addition, the future of fieldbus technology was examined in the context of the current world market and to converge on suppliers offering the best combination of price, performance, quality in combination with worldwide service and support. Results of the workgroup were announced in February 2002. In Europe, two guideline suppliers were chosen for Pressure and Temperature, with Siemens being one of them.

However, as DuPont began working together with Siemens, they quickly recognized the value of compatibility of Siemens PCS 7 automation system together with Sitrans P and Sitrans T process instruments for pressure and temperature. ‘By applying Siemens Totally Integrated Automation with Proflibus, we save time in many critical areas, namely project planning and software development, documentation, start-up and commissioning. The process analysis tools made available by this platform are extremely helpful’, says Rheinhard Mueller, Project Engineer EMC at DuPont, Wuppertal. ‘In addition, we can apply Proflibus both in the field as well as in explosion hazardous areas. In many cases we have real space problems, however, we can eliminate unnecessary cabinets when selecting Proflibus instruments’. Higher transparency, better diagnosis

Using Simatic Process Device Manager software, Sitrans P and Sitrans T transmitters can be seamlessly integrated into the PCS 7 process control system. Profibus communication can then be used to return valuable process and diagnostic information from the instrumentation. Not only can the process engineer see the actual diagnostic status of the instrument, the devices will also provide minimum and maximum process pressure and temperature. In the case of a fault, the user is provided with more than just an alarm. Detailed diagnostic information on the cause of the fault, allows dispatching the proper corrective action directly and immediately.

Thus, DuPont in Wuppertal has decided to standardize on the Sitrans P and Sitrans T family of pressure and temperature transmitters. And it seems that the word is getting out, as DuPont sites in Asturias, Spain and Wilton, UK have followed suit.

The people at RSF Elektronik are very pleased with the new central control system and the Simatic HVAC Library. According to RSF Elektronik, the system’s greatest advantages lie especially in the high operating comfort and comfortable intervention options but also in the high fault-safety. The integrated and effective engineering tools saved a lot of time and money in the configuration and commissioning. Since PCS 7 can be extended and modified at any time, RSF Elektronik can be certain of having made a secure investment in the future.

Standardizing on Sitrans P and Sitrans T: the world’s most modern water paint production facility

Precision, reliability and ease of use - that were the key issues for the Austrian company RSF Elektronik when it came to deciding on a process control system for their new clean-room production. The Simatic PCS 7 process control central system met all these demands. Moreover, owing to the standardized and proven components of the Simatic HVAC Library, the system helped to save a lot of time and money during configuration and commissioning.

RSF Elektronik business focus lies in the development and production of opto-electronic encoder systems and the corresponding digital read-outs. The most important business segments for the Austrian company is the manufacturing of incremental linear encoder systems which they offer in many different versions with a resolution of a few micrometers right down to the sub-micron range.

As part of DuPont Performance Coatings (DPC), this plant produces refinish and serial paints for automobiles, serial paints for industry and plastics and pigments for DuPont’s own processes. In addition, DuPont Wuppertal is the world’s most modern water paint production facility. Not only is the plant fully automated, it is also environmentally friendly. Using uniquely automated material handling techniques, where holding vessels are physically moved through the process, you cannot see nor smell the paint in this facility.

At the company headquarters in Tarsdorf, Upper Austria, a control system had to be found for the clean room of a new production plant. The new plant had to ensure extremely high plant availability by offering appropriate redundant structures and a high degree of decentralization. Moreover, the control system had to guarantee that ambient pressure and temperature in the clean room are always within strict pre-defined limits.

The solution: PCS 7 and Simatic HVAC Library

RSF Elektronik and Siemens Lands Starfa GmbH, the automation partner in this project, found the right solution in the Simatic PCS 7 process control system. The automation systems of the two partners perform to easily guarantee the high control quality required. By using field bus technology consistently throughout the plant, distributed automation structures can be implemented without problems and

Software-related problems during commissioning.

Reliable, comfortable, future-safe

By now, the system in Tarsdorf is up and running. Ever since, the controls have been working without any problems and to full satisfaction, as the engineers and operators at RSF are knowledgeable. PCS 7 ensures that the temperature, pressure and humidity in the clean rooms of the production at Tarsdorf continuously remain within the defined strict tolerance limits. A redundant pair of servers and an optical Fast-Ethernet ring ensure the high availability required for manufacturing.

The people at RSF Elektronik are very pleased with the new central control system and the Simatic HVAC Library. According to RSF Elektronik, the system’s greatest advantages lie especially in the high operating comfort and comfortable intervention options but also in the high fault safety. The integrated and effective engineering tools saved a lot of time and money in the configuration and commissioning. Since PCS 7 can be extended and modified at any time, RSF Elektronik can be certain of having made a secure investment in the future.
Smoother Production

Measuring PVC Powder Levels At Anglian Windows

Anglian Windows, headquartered in Norwich, is the UK’s number one home improvements company. With more than 30 years in business, Anglian has established a leading market position and earned a reputation for top quality, energy-efficient windows, doors and conservatories. To ensure smooth production, Anglian wanted an effective way to measure the level of PVC powder, one of its main production ingredients. Mercap measuring devices have mastered this demanding task.

PVC is stored in three 12.5 meter high aluminum silos, each holding up to 60 tons of material. Ingredients from the silos are supplied to the hot mix process to produce the final product for extrusion. The powder is similar in consistency to talcum powder and is notoriously difficult to monitor. The company needed an effective measurement technology for this application to prevent material shortages that could affect production.

Advanced solutions for challenging tasks

Anglian found an answer in Siemens Milltronics Mercap level measurement instruments. Mercap uses a unique frequency-based approach to capacitance technology that outperforms conventional devices. Its patented Active-Shield technology isolates the active shield portion of the probe from the sensor as the active measurement section. The measured signal is connected to the active shield portion of the probe, effectively eliminating the electrical potential difference between the shield and the measurement section. As a result, the probe is not affected by changes in vapor concentration, material buildup, dust or condensation. This means reliable, accurate level detection, even in demanding conditions. For this application, Mercap units with 10.5-meter cablestyle probes were mounted horizontally in the lower part of each silo to monitor the level of PVC powder. The cables are attached to the probe and secured vertically inside the silos monitoring levels to the top. The powder forms a dielectric between the silo wall and the probe, and the resulting capacitance value is converted by the Mercap unit to a signal which is proportional to the level of the silo contents.

The electronic transmitter, housed in an explosion proof enclosure, converts the change in capacitance resulting from the change in product level into a standard 4-20mA or HART process signal. Output from the Mercap units feeds directly into the plant’s SCADA system, providing operators with easy access to continuous monitoring data. The system automatically reorders materials when levels reach a set point. On an adjoining silo containing calcium – another production ingredient – the problem of rat holing made continuous level measurement impossible. To address this challenging weight challenge, they use four Siemens Milltronics Applied Weighing Safe Mount load cells to weigh the silo, which has a capacity of 40 tons.

Ensuring timely delivery

“The Mercap system achieved accurate results from the moment it was installed and has gone on to prove the system’s reliability,” says Mark Jobson, Continuous Improvement Engineer at Anglian Windows. “Our suppliers are updated every half an hour via a fax modem to ensure timely deliveries to our site for the replenishment of stock.”

Tim Little, Siemens Milltronics, Peterborough

A Perfect View

Lafarge Improves Load-Out Efficiency with Sitrans LR 400

Lafarge is the largest Cement Company in the world with annual production of 150 million tons. Its plant in Alpena, Michigan, is the largest in North America with an annual production capacity of 2.7 million tons. Sitrans radar technology monitors the level of cement silos in Alpena, improving load-out efficiency.

Located on Lake Huron, the high plant’s primary load-out method is onto barges and cargo ships. Material from the finishing mill is supplied to the cement silos with a dense phase pneumatic conveying system. Cement from the silos is then conveyed via air slides to the load-out barges that transport it to Lafarge cement terminals throughout the Great Lakes region. For the years, Lafarge tried several technologies to measure the level in the finished cement silos, but none were fully satisfactory. The silos are 100 feet (app. 30 m) high and very narrow. During extremely windy days, the extreme dust created during filling hampered most devices. An ultrasonic system measured reliably during stagnant conditions down to approximately 60 percent of the total height of the silo, but would then lose echo and produce erratic readings beyond that point. With the silo being continuously filled and emptied, the system could not read past the top 30 percent of the silo. The extreme dust completely attenuated the signal. Lafarge wanted to automate this process to obtain reliable readings, and to reduce staff and maintenance costs.

Radar technology tackles difficult conditions

In July 2001, Lafarge undertook a trial of a new radar instrument system. In the past, this was a manual process. To ensure an optimal signal for the processing capabilities including Auto-False-Echo Suppression, and it is unaffected by vapors, high pressure, or extreme temperatures. The non-contacting technology requires virtually no maintenance. The output of the LR 400 was connected to the plant’s PLC system and the results were trended and monitored daily for performance. To ensure an optimal signal for the plant’s SCADA system, processed readings that make load-out easier and more efficient. The reliable performance of the Sitrans LR 400 enables Lafarge to automate the silo level system on the finished cement bins, eliminating the need for staff to take daily

The Sitrans radar instrument provides reliable level measurement even in the dusty conditions found in cement silos.

Wilhelm van Oosterhout, Siemens Milltronics, Breda
Partners in Siberia
Simatic PCS 7 in the largest PVC production in Russia

The town of Sajansk near Irkutsk in Siberia is the center of Russian PVC production, with JSC Sajanskchimplast manufacturing about 250,000 tons of this versatile plastic per year. The Simatic PCS 7 process control system helps the company to maintain its strong position in the national and international markets.

A part from their main product polyvinyl chloride (PVC), JSC Sajanskchimplast also manufactures liquid chlorine and caustic soda. The company was founded in 1970, and in 1998 the plants were no longer up-to-date. JSC Sajanskchimplast then decided to refurbish the PVC production step by step, implement an efficient process control system and modernize the factory's safety technology at the same time.

Local service and support were decisive
After extensive comparisons, JSC Sajanskchimplast chose Simatic PCS 7 as their new process control system not only because Siemens had built an excellent reputation as a supplier of high-quality products. Another important argument in favor of Siemens was that, at the time the project was in the bidding phase, Siemens was the only competitor offering an established service and sales structure in Siberia. In 1993, the Sinetik GmbH with its headquarters in Novosibirsk was enlisted as a partner for this task and is now one of the most successful Siemens partners in the whole of Russia.

In the first project phase between January 1999 and August 2000, three of the five process units, the utilities and the management systems for economic data in the vinyl chloride synthesis were converted to Simatic PCS 7. Based on the PCS 7 Version 4.02, Sinetik developed an automation solution tailor-made to meet customer requirements. In August 2000, JSC Sajanskchimplast decided to automate the safety technology with the new failsafe AS 4171H and to revise the user software for the safety technology, the utilities and another process unit based on the PCS 7 Version 5.1.

Making excellent progress in the project
These tasks are expected to be complete by August 2002. JSC Sajanskchimplast is very pleased with the course of the project and especially with the Simatic PCS 7 system. “With PCS 7 we can now monitor and control the processes more easily, comfortably and above all more accurately. The modernisation of the safety systems means fewer faults in the plant. Owing to the extensive diagnostic functions, we can now improve plant availability considerably and run our production processes more cost-effectively”, as Julij Ribinovich, responsible for plant automation at JSC Sajanskchimplast, reports.

Cooperation will continue
Starting in August, the last remaining process unit in the vinyl chloride synthesis will be converted to the new process control system. Due to the good experience made with the PCS 7 Version 5.1, the units already equipped with the older PCS 7 version will also be brought up to date. By the end of the year, the polyvinyl chloride plant and the production of liquid chlorine are scheduled for modernization. Siemens and Sinetik will be in the team and without a doubt keep up the good work.

Ralf Börger, Novosibirsk

When the requirements for the product portfolio at Fresenius Kabi in Friedberg were changed, the automation was switched over to a Simatic PCS 7 solution with BatchFlexible. What made this project so special was the fact that implementing the new system had to be completed during a period of three weeks, which only occurs once a year. The project team of Lang and Peitler Automation GmbH, consulting engineers in Ludwigshafen am Rhein successfully rose to this challenge.

The heart of production in Friedberg is the “Formulation” unit with eight production lines that are parallelly producing more than 500,000 bags of infusion solutions. These lines can only be changed over as a complete system. Therefore the project had to be carried out during the three-week production shutdown.

Since production losses were unacceptable, Fresenius wanted to have the option to switch back to the old system as a fall back strategy. One week of the three week period was therefore reserved for restoring the old system.

The main objectives for the new solution were clearly defined from the start: more reproducible processes, higher quality, greater plant flexibility and cost savings. In addition, the system had to offer a simple solution for the complex recipe management of the batch processes, be able to generate recipes independently of sub systems and process up to 25 concurrent control recipes. All this in accordance with GMP regulations and the special requirements for manufacturing sterile medical products.

After extensive research, the experts decided to replace the old system entirely with PCS 7 and BatchFlexible. After the company board had approved the investment in June 2000, the Ludwigshafen engineering consultants Lang and Peitler secured the contract for implementation of the project in October 2000.

The countdown was on
By April 2001, the PCS 7-hardware and software including the operation and visualization as well as the simulation program were completed and the necessary reconstruction work in the process was finished. On the 16th of July 2001, the project entered its most critical stage: the annual production shutdown began and with them the round-the-clock conversion phase. Unit by unit, the project team gradually completed the systems, tested them and checked the basic functions and their interaction. Thanks to the commitment of Lang and Peitler and Siemens, the system was running normally after three weeks, as Stefan Faber, Project Manager at Fresenius Kabi pointed out. “Not even the staff of the downstream filling lines noticed anything about the time-critical situation during the changeover to Simatic PCS 7.”

Everything running smoothly
The employees have been quick to adapt and to accept using the new features. Now they can detect parameter offsets and their causes by themselves. The flexible structure for creating recipes provides the users with components for “composing” production procedures. Plant availability is now also increased significantly. Thanks to the greater dosing accuracy adjustments have become rarer and the higher availability of process data for plant management makes condition-based maintenance easy.

Valve nodes distribute the media to the individual storage tanks

It is therefore no surprise that the engineers and opera tors at Fresenius Kabi all see the project as a success – and would always make the same decision for PCS 7 from Siemens and the know-how of Lang and Peitler again.

Clavdia Cich, Lang and Peitler Automation GmbH, Ludwigshafen
One system does it all
Sitrans FM flow meters in paper production

From preparation of the pulp right up to treatment of the sewage, in paper production the flows of such different media as pulp, filling materials or chemicals must be measured exactly – especially when such high-quality papers as Gruppo Cardennons SA in Malmedy, Belgium, produces are concerned. With the Siemens Sitrans FM flow meters, the company has found an integrated solution for all these diverse tasks.

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hort-fiber and long-fiber raw materials and recycling paper from the site are processed in Malmedy in three lines with the help of process water, chemicals and treated with additives and other fillers such as pigments. The two different long- and short-fiber pulps and the recycling paper are used to generate the suitable paper pulp for the desired paper quality and fed into the paper machine. After the paper has been pressed and rolled, it is transported to the dryer section where it is dried with steam-heated drying cylinders. In between the dryer sections, the paper can be coated or subjected to an additional surface treatment in the coating section. The wastewater from the paper production is treated in the factory’s own sewage treatment plant.

Whatever the task, measuring the flows of all added substances is vital in paper production.

Even the slightest fluctuation in the dosage of dyes and in controlling the pH value can already dramatically alter the shade of the paper rendering it useless. In the surface treatment of the paper, the coating must have a completely uniform distribution on the paper surface or the quality of the end product will suffer.

For that reason, the engineers in Malmedy were looking for a system that could handle the wide range of different process media and flow volumes. They found the right solution with the Sitrans FM flow meters from Siemens.

Always the right solution: Sitrans FM

The magnetic-inductive devices of the Sitrans FM series are available in two different versions. Sitrans FM Intermag operates with a clocked unidirectional magnetic field and is used in Malmedy for standard applications. Due to the high signal-to-noise ratio these devices are well suited for the reliable monitoring of contaminated process water flows for instance.

The patented clocked alternating field of the Sitrans FM Transmag greatly extends the range of the Sitrans FM devices. It can also cope with pulsating or highly viscous media such as paper coating and is even suitable for materials which have a very low conductivity such as the heating steam condensate in the dryer sections.

In addition to the chemically resistant PTFE liner for the test tubes, the Sitrans devices can also be delivered with a Novolak liner that is used frequently in paper mills – especially for tasks with aggressive or abrasive media. In Malmedy for example, a Novolak liner is used in the devices that determine the flow of the paper pulp before the paper flows into or out of the sewage treatment plant.

Standardization releases potential for rationalization

With the Sitrans FM devices, the paper factory in Malmedy can use an integrated system for such different measuring jobs as determining the supply water flow or measurement of subtle flows of dyes or chemicals. This high level of standardization not only saves money in spare parts stock and procurement – it also simplifies the maintenance and repair of measuring devices because the personnel only have to be familiar with one type of flow meter.

Catalysts for tomorrow

In cooperation with Siemens, Buderus Heiztechnik GmbH has developed a lab-test compartment to investigate the operational behavior of fuel cells developed for domestic energy supply systems. The compartment supplies a realistic feed gas for the fuel cell and analyzes both input and output gases used for calculating the complete mass balance in and around the fuel cell.

The process experts from Siemens Axiva can draw on years of experience in fuel cell research and took on the task of developing an analyzing process. Together with the analytic specialists from Siemens, the project team developed a solution based on Siemens analysis systems. Ultramat 6E-2P devices measure the carbon monoxide content, Ultramat or Oxymat 6E devices monitor carbon dioxide and oxygen. Ultramat 6E devices with an upstream convertor measure the nitrogen oxides and an Ultramat 5‘ maps the water content.

A Fidamat SE determines the hydrocarbon contents. Also part of the system is a lab-test computer that can either select the individual measuring points automatically or manually evaluate the data.

The new lab-test compartment started operating in May 2002. Since then the experts at Buderus are continuously working on optimizing the fuel cell prototypes so that households will soon be able to generate their own electricity with this innovative and highly efficient technology.

Frank Valverdenb, Karlsruhe

Siemens analyzers monitor the conversion process in the fuel cell

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he next few years will see stricter European standards aiming at restricting NO\(_{x}\) emissions in combustion exhaust gases. It is therefore necessary to develop new catalysts, which can reliably convert nitrogen oxides to nitrogen in the presence of hydrocarbons and oxygen.

A team of scientists at the Jussieu University in Paris in close cooperation with industry has taken up this challenge. With the aid of modern Siemens analyzers, the research group is investigating the behavior of new catalysts in a micro-reactor. A Fidamat SE device measures the content of hydrocarbons in the gas stream precisely, and a chemoluminescence analyzer CLD 700 AL from ECO PHYSICS determines the percentage of NO, NO\(_{2}\) and NO\(_{x}\) at the reactor output related to temperature and reaction time. Since the test reactor operates with very small flows of only about 250 milliliters per minute, the Fidamat and the CLD are equipped with an upstream amplifier system that adds air to boost flow volume. Nevertheless, the highly sensitive devices achieve the required measuring accuracy. The added air is used to back up the flame in the Fidamat.

Parallel to this an Ultramat 6E monitors the 18-active components CO, CO\(_{2}\), and N\(_{2}\). An up-stream Permapure desiccant removes water vapor from the micro-reactor without affecting NO\(_{x}\) and hydrocarbon contents.

This analysis solution is working successfully not only in Paris. A similar system was recently sold to Vietnam where research in this field is also being conducted.

Eric Hénin, Paris
Michel Kulb, Karlsruhe
Absolutely pure
Sitrans FM 711/A transmitters guarantee drinking water quality

One of today’s most innovative drinking water treatment plants in Germany can be found in Siegburg-Siegelknippen. There, a new process concept was able to reduce the amount of conditioning chemicals. The concept relies on the highly accurate Sitrans FM Intermag transmitters. Built-in grounding rings enable excellent measuring results with all pipe materials.

In order to save a lot of time and money during the implementation of their projects, customers can commission Siemens to do a plant simulation run to identify and eliminate system faults in advance. Siemens develops and tests driver components for proprietary field devices and if a customer has developed function modules or solutions for the PCS 7 control system, Siemens tests their suitability and certifies them for the PCS 7 Add On catalog. Customers from the pharmaceutical industry can also get Validation Support from Siemens.

The Factory Acceptance Test (FAT). It is up to the customer to decide whether Siemens is to conduct the entire FAT or only provide the appropriate infrastructure.

Carsten Köhler, Karlsruhe

Experience and clever ideas are what it takes during plant planning and development. Siemens offers services tailored to their customers’ needs, which form the basis for fast commissioning and successful plant operation.

I n the configuration inspection, Siemens experts check whether the configuration developed by the customer is technically feasible and offers more potential for optimization and develop alternative solutions where necessary. Whether in the field, control, MES or ERP level, Siemens Interface Support offers extensive support in the planning, creation and execution of the optimum interfaces.

Support for beginners
Customers using a Siemens system for the first time can rely on the application support of Siemens. The system experts give tips and tricks that help the user in getting a firm hold of the new technology and its application.

Upon request by the customer, Siemens will also take over the entire configuration and software engineering of a plant, deploy additional personnel during times of staff shortage and take responsibil-ity for the entire project management.

In about 200 training centers around the world, Siemens holds numerous customer training seminars and courses adapted to regional require-
ments. Normally both the course and the appropriate training material are available in the language of the country. Via the extensive Online Sup-
port, the customer can access an additional information pool 365 days a year 24 hours a day. The Technical Support answers ques-
tions about the technology of the Siemens systems and prod-
ucts round the clock.

In order to save a lot of time and money during the imple-
mentation of their projects, cus-
tomers can commission Siemens to do a plant simulation run to catalog. Customers from the pharmaceutical industry can also get Validation Support from Siemens.

The Factory Acceptance Test
At the end of the planning and development phase is the Fac-
tory Acceptance Test (FAT). It is up to the customer to decide
whether Siemens is to conduct the entire FAT or only provide
the appropriate infrastructure.

Carsten Köhler, Karlsruhe

Level monitoring via Profibus DP
The Siemens Mältronic Enviro-
Ranger ERS 500 is reliably mea-
suring the levels in the feeder of a sewage treatment plant in the Ruhr region, transferring the data us-
ing the plug-in SmartLinx card via Profibus DP to the Simatic S7 Con-
troller. The data is used to control the sewage flow to the treatment plant. Communication via Profibus DP can be easily implemented. The drivers are delivered on floppy disk with the EnviroRanger and can be easily in-
stalled on the central visualization PC. After just a few minutes, the level monitoring results can be viewed on the PC screen.

Rudolf Raustert, Essen
Making a Contribution to Progress

Siemens was recently awarded the order for a Quantra FT-IR Mass Spectrometer from Engelhard Catalyst Corporation based in Lincoln, New Jersey. As a major manufacturer of catalyst used for emission control and refinery operations, it is important for them to continually develop new and innovative catalyst solutions.

As part of those efforts, the need arose to monitor the exhaust-gases from various catalyst test systems. It was important to know the concentration of a wide range of gases from the parts-per-million range on up to the percentage levels. It was also important that the analyzer be flexible to handle various composition scenarios as well as be able to identify unknown compounds should they be present. This was a precursor description of the features found in the Quantra.

Traditional quadruple mass spectrometers have difficulty telling the difference between N₂ and CO₂ (approx. mass 44) and the difference between N₂ and CO (approx. mass 28). However, with the inherent high mass resolution power of the Quantra, these components are easily separated for interference-free measurement.

Dowerije means confidence

Despite an annual mean temperature of -14°C, Norilsk in Western Siberia is home to the largest company for the mining and processing of non-precious metals. From here, Norilsk Nickel supplies about 40% of the world market with palladium. The company was privatized in 1994 and also mines many other non-precious metals, contributing with two percent to the total gross national product in Russia.

In view of the special conditions in Norilsk, "Dowerije" – confidence – in the abilities of the supplier for analysis systems plays a major role. After all, the technology still has to work perfectly even when Siberian winter temperatures drop below minus 50 degrees Celsius. In the course of modernizing the 20-year-old factory, Siemens Moscow succeeded after long and intensive negotiations in winning the order for delivering complete analysis systems and more than 200 sensors and transmitters. The systems are designed and built by Siemens in Karlsruhe.

This important order further strengthens the good, trusting relationship between Siemens and Norilsk Nickel.

Simatic IT in action at Rhodia Acetow

Rhodia Acetow is the third largest manufacturer of cellulose acetate tow for cigarette filters in the world and one of the leading suppliers of cellulose acetate flakes. Forburg in Germany is the home of the Rhodia Acetow headquarters and one of the six production sites – and also of a modern MES system supplied and implemented by Siemens.

The integration platform Simatic IT Framework interconnects the different MES components and bridges the gap between MES and the Enterprise Resource Planning (ERP) systems. Moreover, an implementation of the Simatic IT Scanning Manager is planned to allow for the future integration of barcode scanners.

The comprehensive concept of the Simatic IT solution was a convincing argument in favor of Siemens – but what was even more important was the fact that Siemens as a global player has the know-how to transfer the MES concept to other filter tow production sites. Rhodia therefore decided to give the general contract for the project to Siemens. The second stage of the project is expected to be complete in February 2003.

Dow Chemical Company

The Dow Chemical Company and Siemens have entered into a global agreement in which Siemens is named as the strategic supplier of Continuous Gas Oxygen Analyzers for all of Dow Chemical’s manufacturing sites around the world. This agreement has resulted from the quality and performance of the OxyMat oxygen analyzer in Dow facilities.

This agreement focuses on the oxygen analyzer. But because Siemens has an excellent reputation as a supplier of high-quality products and has a strong global service organization and the performance of the Siemens IR analyzers in Europe, Dow is also listing Siemens as a supplier of infrared analyzers in the Acceptable Manufacturers and Suppliers List.

Gas Analyzer Agreement with The Dow Chemical Company