

STMicroelectronics treats water with Siemens process control system PCS 7

Near to drinking water

Ondeo Industrial Solutions GmbH Hager + Elsässer Center of Excellence in Stuttgart, Germany, designed and built a treatment plant for diluted waste water automated with Simatic PCS 7 for STMicroelectronics in Crolles, France. Ondeo IS S.A., France, is responsible for operation and overall maintenance of the plant.



The use of acids, bases and solvents to manufacture semiconductor components requires the latest technologies for treating the waste water due to today's environmental protection regulations. If the treatment plant fails, produc-

tion would come to a halt in a few hours because the waste water may not enter the environment under any circumstances without prior treatment. The costs of such a failure would amount to several million dollars.

Near drinking water quality

At STMicroelectronics, one of the five leading manufacturers of semiconductors worldwide, complex chips are manufactured at two plants in the Isère Valley in

Crolles between Grenoble and Chambéry. The new treatment plant went online in October 2003 for the entire site. Once the start up and test run phases are concluded, the plant will be able to treat up to 500 m³ of waste water per hour without passing through a regional water treatment plant. After treatment, the waste water reaches a near-potable water quality.

Depending on the composition and source within the production chain, the contaminated waste water is collected from the various production buildings and purified in six treatment steps using physio-chemical and biological processes. The most important treatment process concerns the waste water from the CMP (Chemical Mechanical Polishing) process. After completion of the last treatment step, the ratio of residual contaminants is distinctly lower than the limit values specified by the inspection service of the DRIRE (regional public authority for industry, research and the environment). Thus, the treated waste water can be discharged directly into the Isère river. This very tangibly demonstrates STMicroelectronics' commitment to the environment. The residue in the filter presses are treated and disposed of in an environmentally-friendly manner by external, authorized specialists. Because adherence to the specified limit values must be documented appropriately, the plant includes a station – in addition to the series of automatic online analyzers – which automatically takes water samples above the outlet and stores them until they are handed over to the inspection authorities.

Complete offer

Initially, STMicroelectronics concluded a BOO (Build, Own and Operate) contract with Ondeo S.A. over 5 years. This contract provides that Ondeo will assume total responsibility as the operator – from planning to construction and operation of the plant all the way to disposing of the residue. A total of nine people work at two stations and make sure the water treatment runs efficiently.

Three collecting tanks are provided for the untreated or insufficiently treated waste water should the plant function fail. Its capacity is equivalent to 36–48 hours of production. Consequently, the failure must be remedied by no later than this time in order to avoid interrupting production.

Ondeo Industrial Solutions is one of the main providers of complete solutions for the treatment of process water and desalinated water as well as for the treatment and recycling of industrial waste water. The company belongs to Ondeo, the water division of the Suez Group, which is the market leader in the areas of both energy and environment.

Ondeo IS GmbH Hager + Elsässer Center of Excellence in Stuttgart, Germany, are the application specialists for semiconductors, the pharmaceutical industry and power plants. The entire range of products extends from requirement analysis to project development, to design, installation and set up, all the way to operation and maintenance.

More information about Ondeo:
www.ondeo-is.com



Simatic PCS 7 for safety

To prevent such a serious failure, both the central treatment groups as well as the most important components of the automation technology are designed with redundancy.

A total of 2,800 data points are connected to two S7-417-4H CPUs and two S7-417 CPUs via distributed ET 200 I/O devices, which are redundant either in part or according to availability requirements. Because the pump station was built 1 km from the actual fab, the system bus is designed as a fiber-optic ring. A second S7-417 provides the connection for this device and the remote equipment, located away from the actual treatment plant, through the exchange of necessary information via digital and analog signals.

All plant information is collected at a control station that is equipped with a redundant PCS 7 server in order to guarantee fail-safe operation around the clock.

Ondeo IS GmbH contracted the company ATB Automatisierungstechnik Lothar Brodbeck, which had also delivered the control cabinets for the PCS 7 system, to design the automation concept, develop the user software and set up the system. When developing the software, they used the program library designed by Siemens in conjunction with customers in this sector specifically for the needs of the semiconductor industry. The use of this library, which has been

tested and proven in the field, guarantees the users an application that is reliably designed and delivered on time. As Mr. Leitmann, Technical Director of ATB Brodbeck, proudly reports, this is the first project from ATB Brodbeck designed with PCS 7 V6.0. He goes on to say that familiarization with version 6 as well as with the project itself went smoothly.

Productivity with Siemens

When questioned why Ondeo decided on a solution with PCS 7, Victor Skibinski, who was the project manager and responsible for the design, answers that in addition to the known reliability of the system and its performance, positive experiences from previous projects made the decision easier. "Ondeo focuses increasingly on standardized concepts in order to achieve the productivity increases required by the market and to be able to comply with the ever shorter deadlines. Therefore, Siemens has proven itself as an ideal partner with its PCS 7 standards for semiconductors."

In addition, the worldwide presence of this partner at the heart of the European and Asian markets was a considerable deciding factor for Ondeo, which recently opened an office in Shanghai after those in Singapore and Taiwan. ■

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