“And it’s a good thing we’ve made a start,” says Dr. Thomas Tauchnitz, head of engineering of the Technology Process Group at the Frankfurt pharmaceuticals site of Sanofi-Aventis Germany, regarding the first pilot project for the integration of Comos and Simatic PCS 7. We spoke to him about results and his expectations.

Dr. Tauchnitz, you published an article back in 2005 that propagated the concept of integrated engineering for process technology and automation. The article ended with a reference to tools that could enable such integration at that time but that had not yet been used to implement it. What was your aim back then?

Tauchnitz: The reason was the current situation that existed at our company here in Frankfurt five years ago. You could say that there were irreconcilable differences between the process engineering and design and the implementation of the corresponding functions in the control system, although even then I believed that both worlds could be “happily married.” I therefore wanted this article to be understood as an appeal to our partners on the system supplier side to tackle this problem. We were already in negotiations with some providers. Then Siemens bought Innotec, whose Comos engineering software we had been using for years. That was the signal for me: our idea could now be realized.

What happened next?

Tauchnitz: The first pilot project was initiated in mid-2009. We had chosen a small but typical plant for pharmaceutical production – a preparation tank with a volume of 3,000 liters. We wanted to take a step in the direction of integration with this pilot project, and we were successful – although I must stress that we are still far from reaching our final goal even after the completion of this first pilot project.

Is this not a rather disappointing result?

Tauchnitz: Not at all. We knew we had a long way to go. The important thing is that we have made a start. Now we are working with Siemens to develop the integration further. We are working on important items that have not yet been implemented at the moment: the automatic creation of the equipment modules for PCS 7 and the bidirectionality of the automatic data exchange. The last item especially is important for us as an operator. We have also gained important knowledge about why process engineers
and control technology specialists sometimes have difficulty understanding each other, and we will use this knowledge in the future.

Does that mean the collaboration will continue?

Tauchnitz: Certainly. In the next project we will structure the plant during the functional planning of the process technology so that it is easier to reuse the software. I think Siemens has also learned that company-wide standardization of the equipment modules in process technology is not possible and not useful either. This will certainly be considered in the further development of the interfaces and func-

And how do you assess Siemens’ plans to integrate an appropriate interface for exchanging engineering data in Simatic PCS 7 and Comos?

Tauchnitz: This integration is important because it is the only way to maintain the interface, in my opinion. We will have a different Comos version and a different version of PCS 7 in 5 or 20 years. And it must still be possible to make changes to the plant in both systems and to create a uniform state of document-ation. An integrated interface is important for this, and from the point of view of a pharmaceutical company, I would of course want this interface to be validated.

Although it’s definitely too early to draw a final conclusion, what do you think of statements that claim that engineering savings of up to 20 percent are possible?

Tauchnitz: I even go so far as to say that 20 percent is an understatement for the area of functional planning and automation software creation because much of it is still very much “handmade.” But that’s just a fraction of the benefits, in my opinion. We can see the potential for enormous improvements in the following four areas: First, the project time is re-
duced considerably. At the moment we are talking about four months for the system programming between the function clarification and the commission-
ing; in the future this time will be about two weeks. In the ideal case, we only really need the runtime for the compiler – just a few hours, in fact. Second, the qualification will be easier. A qualified interface that transfers data between systems makes no mistakes. I only need to make sure that the data I entered were correct. I have already mentioned a third point, and that is the system documentation. At the moment it is difficult enough to have standard documentation at the end of commissioning that corresponds to the real plant conditions. Believe me – after a plant lifecycle of 20 years, the documentation has nothing to do with reality anymore. These lifecycle aspects are extremely important, especially in the pharmaceutical industry, and there is much room for improve-
ment here. And fourth, such a system provides the opportunity for us to become a learning organization. Once we have created the appropriate func-
tions for a preparation tank in the system, we can use them again and again. Certain modifications are always necessary, but we do not start from scratch. All in all, these advantages are much more decisive than the mentioned 20 percent engineering expense that I save in the software area.

Dr. Tauchnitz, thank you for speaking with us.

»We see the potential for enormous improvements.«

Dr. Thomas Tauchnitz, Head of Engineering of the Technology Process Group at the Frankfurt pharmaceuticals site of Sanofi-Aventis

Doesn’t this close collaboration make you too dependent on one supplier?

Tauchnitz: Dependency has very negative connota-
tions. For a company like Siemens, which focuses on fulfilling the wishes of its customers, such a project is a great opportunity to understand customers’ requirements even better.

Dr. Thomas Tauchnitz, Head of Engineering of the Technology Process Group at the Frankfurt pharmaceuticals site of Sanofi-Aventis

Doesn’t this close collaboration make you too dependent on one supplier?

Tauchnitz: Dependency has very negative connota-
tions. For a company like Siemens, which focuses on fulfilling the wishes of its customers, such a project is a great opportunity to understand customers’ requirements even better.
Successful pilot project at Sanofi-Aventis

Sanofi-Aventis and Siemens recently implemented the first application of integrated engineering of process control and process functions. The pilot project was a preparation tank with a capacity of 3,000 liters for the pharmaceutical production plant in H600 on the Frankfurt-Höchst industrial estate. This plant is small and compact, but it also includes many typical units and processes, which made it suitable for a proof of concept of integrated engineering. The preparation tank contains a total of 10 equipment modules.

The functions are controlled by the Simatic PCS 7 process control system. A Simatic PCS 7 Box RTX system that communicates with the distributed Simatic ET 200M I/O systems, a Simocode motion control system, and a Simovert frequency converter are used as hardware. The measuring points in the plant are linked primarily via Profibus PA.

From the typical to the function sequence

The appropriate Sanofi-Aventis Comos typicals formed the basis for the engineering. These typicals were ported to the corresponding continuous function chart (CFC) typicals in Simatic PCS 7. The project team used the plan-in-plan method. Every typical has the same name in Comos and in PCS 7 and has the same inputs and outputs. It is therefore immediately identifiable as a Sanofi-Aventis typical in every representation – which is important for good acceptance. In the pilot project, this step needed a few manual interventions. However, data were also transmitted automatically in parallel via the Simatic PCS 7 VXM-based interface. In addition, changes that arose in the course of the project were also made to the PCS 7 system during on-site commissioning and then transferred in the opposite direction to Comos. During the work on the real plant in Frankfurt, a team at Siemens in Karlsruhe also worked on a shadow system to further develop the functions for the bidirectional data transfer of engineering data between Comos and PCS 7.

From the concept to the plant

The entire project was carried out by the project teams in Karlsruhe and Frankfurt. First Siemens transferred the Sanofi-Aventis Comos PT typicals to PCS 7, and the system structure from the Comos PT environment was transferred to the appropriate hardware configuration in Simatic PCS 7 with tool support. Almost simultaneously, the measuring point instances from Comos PT were converted into Simatic PCS 7 CFC instances with tool support, and the equipment modules created in Comos PT were converted into PCS 7 sequential function chart (SFC) instances, partly with the aid of automatic tools and partly manually, and the application software for the plant operation was created.

The software was tested at Siemens at the end of July 2009, and the factory acceptance test for the software took place at Sanofi-Aventis at the beginning of August. The systems were installed in Frankfurt in mid-August so that commissioning and validation could commence on August 17, 2009.

Successful completion

Thanks to the partly automatic data transmission, the software engineering was completed much faster than expected. In the meantime, the functionality of the interface between Comos PT and PCS 7 was developed further so that subsequent projects will benefit from the experience gained in the course of this proof of concept.