The process chain is everything:

New methods for switchgear cabinet construction

In switchgear cabinet construction the entire system is more than the sum of the individual component parts. It is not important whether switchgears with bus systems, combinations of different switchgears or ready-assembled mounting plates are used. Instead it is important to interlock design and production in order to control the process from the inquiry to the finished and approved switchgear cabinet. How can this interconnectedness be implemented so that switchgear cabinets can be produced economically and technically sound? ATR Industrie-Elektronik GmbH and Siempelkamp Maschinen- und Anlagenbau have developed a sophisticated process chain.

By Timo Amels

Switchgear cabinet construction ...

... at the Krefeld plant

To what extent are Siempelkamp and ATR Industrie-Elektronik GmbH connected with one another? ATR produces all switchgear cabinets for Siempelkamp Maschinen- und Anlagenbau and is therefore involved in all plant projects. The interface partner within the Siempelkamp business unit Machine and Plant Engineering is the division for Automation Technology. This division creates the electrical documentation that is exactly tailored to the production processes of ATR.

Both companies organize the process chain from the electrical design to the finished and tested switchgear cabinets as if all processes were handled in one and the same company. The benefit for the plant operator: The know-how of the different companies complement one another optimally because these are two specialized partners, one from the area of switchgear cabinet construction and the other from the area of machine and plant engineering, that are working together on one solution. All processes and the interface management are designed in such way that the equipment arrives as one at the customer site.

"With this strategy we have the objective to differentiate ourselves from the large competition in switchgear cabinet construction. The advantage for the customer: We meet the customer demand by producing switchgear cabinets that are technically sound and inexpensive at the same time because the close integration of design and production is an enormous benefit," explains Timo Amels, Managing Director ATR Industrie-Elektronik GmbH.

Werner Schischkowski, Manager of Siempelkamp's division for Automation Technology, adds: "Unique selling points in switchgear cabinet construction require vision. Everything that can be manufactured can be used in some way. The search for considerations and alternatives to the conventional switchgear cabinet construction will find its limits when one starts thinking about an optimal mechanical, electrical, and thermal design which will cover most of the common applications in machine and plant engineering. A head start against the competition can be most effectively achieved with an optimally controlled process chain. This is exactly the point where we start. We use the opportunities offered by our company structure and network!"

Process chain efficiency: Foresighted thinking is everything

What is the process chain procedure like in practice? From the beginning on Siempelkamp and ATR rely on foresighted thinking. A significant part of standard switchgear assemblies is produced for stock and is thus available for pre-wiring on time. This ensures optimal lapses of time.

Handicraft

Keeping track of everything

Before production start, the scope of supply and services as well as the implementing regulations are discussed in order to guarantee transparency without friction losses from the beginning on. Afterwards, production is precisely informed about scope and details of the projects. Even the time guidelines for the production are defined.

Afterwards ATR carries out the material planning for long-term projects. The ordering of material takes place via the interface of the machine supplier in ATR's ERP system. A cumbersome exchange of documents is omitted. Component parts are directly ordered from the supplier without paper handling. Switchgears and cabinet plates arrive pre-assembled to whatever degree needed. Terminal blocks are ordered pre-assembled via graphics and specifications or are assembled during the production process.

Enclosure layout: putting system into everything

Enclosure layout plans are developed by Siempelkamp's electrical design department. New constructional designs are discussed and optimized with ATR. The drilling data for the mounting panels are directly transferred via the CAE system to one of the three ATR drilling machines. Prior to equipping the mounting panels, all necessary component parts are assigned to the operations. Only the required parts are available, completely labeled and pre-assembled. Cable ducts and mounting rails are transferred from the CAE system to NC-Cut. The cut takes place semi-automatically.

Conventionally, the switchgears are exclusively wired by trained electricians. Here, the circuit diagrams that are optimized to this process are primarily used. For terminal boxes and consoles, the teams are using special wiring lists that tremendously shorten the time needed for wiring. It goes without saying that pre-assembled cables are also used. Another important process step ensuring quality and quick processes: During production and wiring work respectively, specific tests are performed which will shorten the final functional test.

On the test bench

According to test specifications and inspection plan, all switchgear cabinets are tested with regard to their functionality. The test concept is designed in such manner that all drives are preset and equipped with the respective set of parameters. "Our motto is:

Timing

We will preset and test as much as possible but as little as necessary," says Timo Amels.

Siempelkamp machines and plants are king-size and therefore cannot be tested and started up in the factory. "The more important it is to be prepared for the start-up at the customer's site with tested switchgear cabinets and oftentimes with the associated plant components. This will shorten the start-up times tremendously," explains Werner Schischkowski. With competent inspections, ATR makes a substantial contribution in this area.

This process chain demonstrates: The future of switchgear cabinet construction is determined not only by technical skills but mainly by the competence and know-how needed to control the involved processes. "We are proving this fact daily from the enterprise resource management to the tested switchgear cabinet," say Werner Schischkowski and Timo Amels.

ATR Industrie-Elektronik GmbH: Profile and portfolio

- 1970: Establishment of ATR as a company in the fields of development and production of automation plants in Viersen, Germany
- 1987 Merger of Industrie-Elektronik (company name since 1980) and ATR Antriebs- und Regeltechnik to become ATR Industrie-Elektronik GmbH and, as a result, the integration of measurement and control components needed for drive and automation solutions
- Since 1988 ATR Industrie-Elektronik GmbH has been a company of the Siempelkamp Group.
- Core competence: production of switchgears as well as development and construction of measurement and control electronics
- Quality management: in 1996 certification to DIN EN ISO 9001
- Quality standard: "For us, quality is not only related to product quality. Qualified consulting, short delivery times and flexibility also take a crucial role in our concept of quality!"
- Our production is complying with DIN VDE / DIN EN standards. With respect to the engineering of switchgears we also produce in line with international standards such as UL or CSA. The UL / cUL authorization may be exercised through our own staff.