Success Story

The transition to automation

Innovative production technology ensures competitiveness

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HAIGER/RATHENOW – The MAP Maschinen- & Apparatebau Produktions GmbH increases their investments in automated production technology. Last year, the Rathenow company commissioned three new CLOOS robot systems. Thus MAP accelerates the production processes and increases the quality at the same time.

MAP's 90,000-square-metre premises could just as easily have housed a giant theme park. Instead, it is a place of welding, drilling and milling where 280 employees manufacture complex structural steel components, containers and vessels as well as other components for different industries. MAP is traditionally strong in the field of electrical engineering and the construction of heavy-duty installations, appliances and containers. Within the company's crane-operated production hall with a total floor space of 25,000 square metres, parts weighing up to 60 tons are assembled, processed, and transported — the company thus connects to the long tradition of boiler and apparatus construction of Rathenow city which dates back more than a century. Beyond this, MAP can also look back on many years of experience in the areas of renewable energy and mining. In addition, series production of welded assemblies with subsequent machining is becoming increasingly important for the company. Since 2007, MAP has been part of the Neuenhauser Group, whose members include around 30 companies throughout Germany. With innovations in automated manufacturing technologies, MAP is responding to the increasing competition in Asia and Eastern Europe. "We want to achieve higher productivity with maximum quality, more predictable costs with reliable lead times and ultimately sustainable jobs with reduced burden on our staff here," explains Lutz Abram, head of sheet production at MAP.

Three new robot systems with cutting edge technology

MAP has thus begun operating three new CLOOS robot systems in the last year. All three systems are characterised by maximum flexibility — an important prerequisite for the variety of different components that are manufactured by the company.

On the largest system, a QIROX QRC-350 robot welds generator housings for wind turbines, among other things. Mounted in overhead position, the robot can flexibly switch between the two stations. Usually, the employees prepare the components at station 2 while the robot welds at station 1.

The welding robot is fitted with two welding torches: Whilst the bent single wire torch is used for welding small, segmented and difficult-to-reach welds, the straight tandem torch can perform long straight welds at high speed. The torch change is performed automatically via a command from the respective program, enabling the system to be used flexibly for different component types.

In the mid-sized compact system, a QIROX QRC-350-E welding robot welds different components. The large range of the seven-axis robot both simplifies and speeds up the welding of the partly complex workpieces. The robot is mounted in overhead position on a C-frame at a floor-mounted linear track. A carriage moves the robot in horizontal direction. Mainly small and medium-sized components are currently welded on this system, however larger parts are planned in the future. The system also has two stations, which speeds up the entire process enormously. While the robot welds the workpiece at one station, the employee can remove the welded parts and reload the fixtures again at the other side.

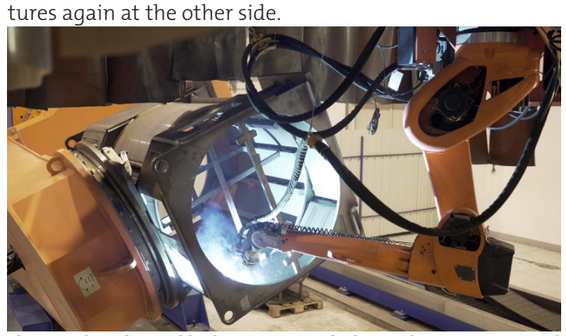

Photo 1: The robot welds short seams with the single-wire process and long welds with the tandem process.

The third CLOOS robot system is an "All in one" system, in which the workpiece positioners, robot and robot positioners are combined in a single unit. They are mounted and aligned on a base plate which allows a fast and cost-effective assembly because no fine adjustment is necessary. In addition, the electrics and mechanics for the "All in one" systems are pre-installed in full, making assembly and maintenance work simple and time-saving. This system is also flexible and thus suitable for welding a wide range of different components.

Rising orders through optimised delivery performance

Through comprehensive investment in automated welding systems, MAP has managed to achieve higher productivity at a lower total cost. "For many components, we were able to strongly reduce the welding time by switching from manual to automated welding," says Marvin Triebwasser, robot programmer at MAP.
In addition, MAP now achieves exactly reproducible welding results and can therefore guarantee customers consistent quality. Whereas with manual welding there were sometimes large variations, the robots now weld even demanding seams uniformly and with a consistently high quality.
"Although we are still at the beginning of automation, we have already managed to improve our delivery performance to our end customers, and have thus far received only positive feedback with regard to part quality," says Abram. Because orders are continuously growing and new components are constantly being added to the production program, Abram intends to have the robots working in three shifts in the near future.

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Photo 2: Previously, one MAP employee used to weld 150 of these small parts per shift. Today, the welding robot in the compact system manages 350 parts per shift.

Improved working conditions for employees

The staff also benefit from the introduction of automated welding. As the welding robots carry out the physically heavy work, the general danger from arc radiation and welding fumes is much lower. At the same time, the welders can concentrate more on monitoring the process. Ultimately, to take full advantage of the innovative technology, well-trained employees are essential.

At MAP, a total of 64 welders are employed in various fields, including ten who are now trained in robot programming at different levels. Intensive training — both on-site at MAP and at the CLOOS training centre in Haiger — ensures that employees are familiar with the new equipment. Five more MAP employees will soon complete their training in robot programming. "Through innovative production technology we want to continuously improve the quality and skills of the MAP staff and provide attractive jobs within our region," says Abram.

Further investment is planned

The partial move away from traditional welding tasks with manual production towards semi-automated manufacturing represents a major challenge for a medium-sized company like MAP. "The conversion takes place in many small sub-steps," explains Abram. "During this time, we depend on good, reliable partners like CLOOS." Through its use of the new CLOOS systems, the company intends to initiate a new chapter in its history. Its sister company, Glüpker Blechtechnologie GmbH from the Neuenhauser group of companies, has already depended on CLOOS welding technology for decades. In addition, MAP and Glüpker are actively supported by the company Engelking, a long-time sales and service partner of CLOOS.

Currently, MAP's employees are still gaining experience with the new robot systems, and the company's internal logistics processes are not yet tuned one hundred per cent to automated production. However, Abram is certain that MAP will make consistent progress along the path to automated welding — two new CLOOS compact systems have already been ordered and will begin operating in mid-2016. "In addition, we are also interested in new, innovative methods, such as laser and laser-hybrid welding, which bring many benefits to the production process," adds Abram. "Only with expertise, innovation and high quality standards can we satisfy our customers and thus ensure our competitiveness in the long term."

Photo 3: The large range of the 7-axis robot simplifies and accelerates the welding of the often complex workpieces.

Video on CLOOS TV

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