

Retrofitting a calendering system in the USA

A major film manufacturer in the USA once again relied on the expertise of Lebbing automation & drives GmbH for the comprehensive retrofit of its calendering line.



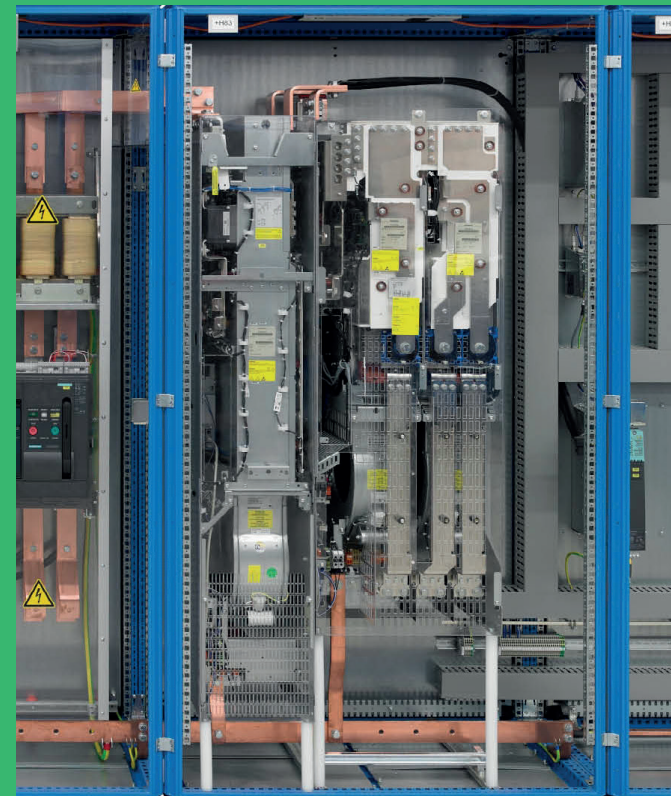
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Lebbing sees itself as a partner to both mechanical engineers and machine operators. The core competence lies in the field of electrical and automation engineering.

Services: Project planning and construction of switchgears, automation, visualization of production processes, In2Lutions (Innovative Industrial Solutions), modernization/retrofit of machines and plants.

Number of employees: 100

Year of foundation: 1998



TASKS:

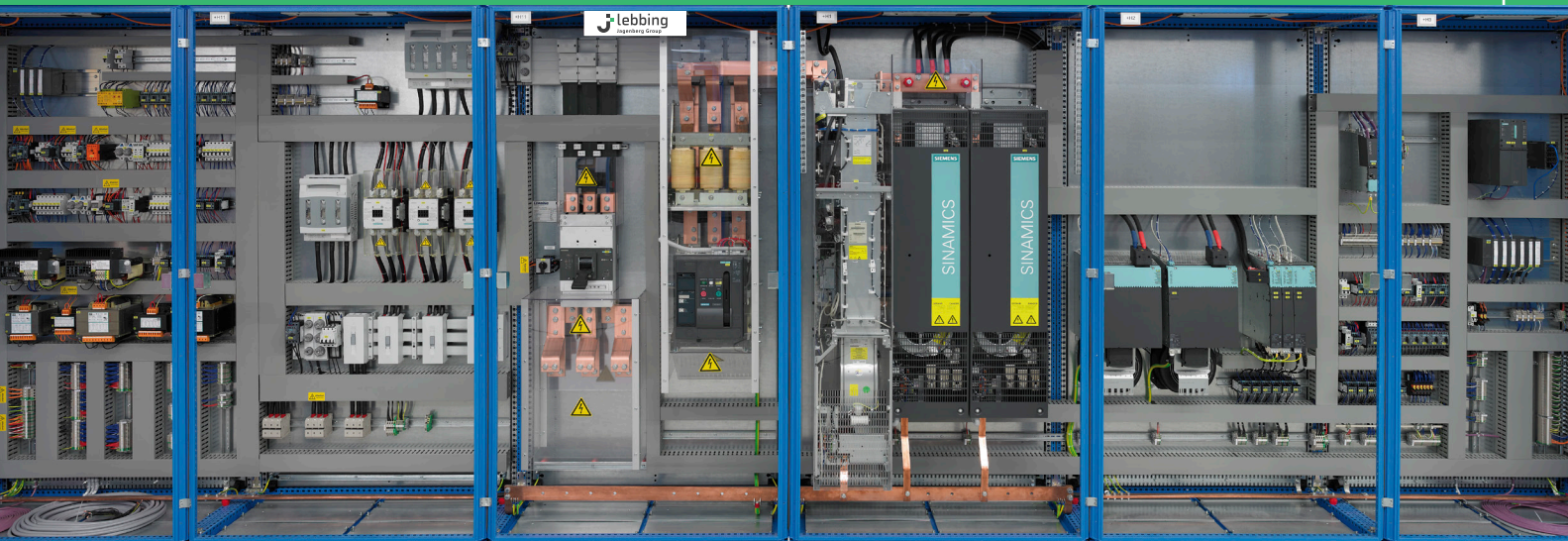
A well-known manufacturer of printed and finished plastic films entrusted Lebbing automation & drives GmbH with the modernisation of all the control and drive components of its ageing calendering line. It was important for the operator to retain the existing mechanical drive components, with the exception of the main drives of the mixing unit and the drives of the kneader, for which the customer supplied new drives. Moreover, current technologies had to be used to ensure that the procurement of spare parts, which is currently difficult, is guaranteed for the future.

A further focal point while implementing the project was the renewal of the process visualisation of the entire calendering line, including the extensive „mixing unit“ with several silos and mixing stations. The project objective included a complete and transparent presentation of process-relevant data for the user and thus involved connection to the customer's existing MES system in its entirety.

Retrofit Calender C23



New main control panel



Section of the switchgear of the retrofit described here

INITIAL SITUATION

The calendering system under consideration here (manufacturer: KKA – built in 1997) essentially consists of the following components:

- mixing unit
- kneader A
- kneader B
- heating
- calender
- non-stop winder

Prior to the modernization of the components described above, various automation systems manufactured by AEG and Rockwell Automation were used. The Siemens SIMODRIVE or MASTERDRIVE drive controllers were used for drive control of the winder and AEG drive controllers were used for the remaining parts of the system.

The controllers used as well as the various drive controller variants had already been discontinued by the manufacturer. As a result, the availability of spare parts for the components was no longer fully guaranteed and manufacturer support had also been largely suspended. Due to the obsolete technology, reliable service could no longer be ensured.

Due to these reasons, the customer decided to have the system modernized, with the exception of the winder, which had been subsequently supplied by a German mechanical engineering company as a new component. The customer continually relied on the retrofitting specialist, Lebbing automation & drives GmbH from Bocholt, during this process.

As the mechanical components showed little or only negligible wear and tear due to good care and regular maintenance, they remained mostly unaffected. The basic substance of the system, which was mostly very stable and of high quality, was thus retained. By retrofitting the system, the customer was able to benefit from significantly lower costs as compared to new acquisition of the production system. In addition, as compared to new acquisition, retrofitting resulted in production being interrupted for a considerably shorter period.

IMPLEMENTATION OF THE RETROFIT

For the retrofit described here, the critical components were therefore replaced with components that are not only currently available but will also be available for at least another 10 years. The primary focus was on replacing the old control and drive technology. In addition, the machine control (HMI) was completely renewed and made more intuitive.

In order to ensure consistency in the selection of components, the system was first analyzed in detail by the experts. Special attention was then focused on the use of uniform components for the complete system to ensure that the spare parts inventory could also be reduced to a minimum.

In engineering, the drive controller of the Siemens Sinamics S120 and G120 product family and the control components of the S7-41x product family were agreed upon in consultation with the customer. Due to the current Profibus structure of individual sensors and actuators, the customer deliberately decided to retain this communication protocol. The current stock supply was not converted to ProfiNet, the current industry standard. The selected components are also being used in the customer's already retrofitted systems.

This retrofit, as well as extensive mechanical maintenance, was carried out within 8 weeks at the customer's facility in the USA after a preparation phase of approx. 8 months. The required control components of the complete system were installed in newly manufactured control cabinets in the system for this purpose. All components (converters, I/O stations, controls, etc.) were already electrified and commissioned in the workshop in advance.

The new operating terminals for the machine controls were provided by the customer and integrated into the system. The entire operating philosophy of the system was implemented in conformity with the customer's other systems in order to make the system operation fully consistent. The visualization was implemented by Lebbing experts.

In a second retrofitting step, the new winder, which had been thoroughly tested in a factory test beforehand, was then integrated into the system and successfully tested. The complete control and drive technology for the new winder was also supplied by Lebbing. In the long term, this technical modernization has created a reliable system with significantly increased machine availability, and the availability of spare parts has also been significantly optimized.