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All on edge

Why the graphic paper market is in turbulence

ABB

All's well that ends well!

In December 2008 the PM 2 at Sappi in Stockstadt, Germany, was equipped with a modern direct drive concept. One year later the paper mill was hit by a fire in a switchgear area which caused considerable damage to the PM 2 and machine hall. The support of ABB played an important role in both cases, and *ipw* was there a short while ago to hear about the cooperation.



Aerial view of the mill

The decision to modernise the PM 2 drives was made back in 2007, recalled Norbert Kessler, the Technical & Engineering manager. The paper machine ran with DC motors and old control technology then. The failures piled up, and there were also problems procuring spare parts, coupled with the fact that the number of the supplier's service staff who were familiar with the system was decreasing all the time.

For this reason Kessler and his team made safeguarding the availability of the machine the priority for this project. After checking and comparing several offers the decision was made to award the order to ABB. The decisive factors were good experience with an ABB drive on a coating machine and the short distance to the ABB branch in Mannheim.

Joachim Gutjahr, who is responsible for Electrical Engineering in Stockstadt, found the DTC control procedure and compact design especially attractive in view of the difficult spatial circumstances. He also emphasised a further argument in favour of awarding the contract to ABB, which was its simple, intuitive programming; the EMR Manager Eugen Seitz stressed that, due to digitalisation, all operations in the drives were transparent and that they were therefore understood quickly and could be better diagnosed.

In all 34 drives were replaced and the controllers assembled again. Where possible, the gears were dismantled

and the motors directly coupled to the rollers of the paper machine. The entire project encompassed the supply of power transformers, ACS800 Multidrive frequency inverters, eleven frequency inverters for permanent magnet motors and 23 frequency inverters for AC induction motors including assembly and commissioning. The direct drive system consists of permanent magnet motors which are regulated using ACS800 frequency inverters. The number of incremental encoders was reduced to seven as a result of the new drive system. The PMC800 application software guarantees the fault-free functioning and safety of the frequency inverter systems.

According to unanimous statements, the changeover went smoothly for Sappi employees who operate the system. The old drive system had analogue operation with potentiometers, push buttons and measurements along the line. These elements were replaced by digital control panels in the ABB solution. These G2000 graphic control panels create an efficient and user-friendly operating interface for frequency inverter applications on paper machines.

Sappi spent over EUR four million on the modernisation of the drives, and following more than three years of operation, Eugen Seitz confirmed that optimisation by own servicing staff had also become much easier because there was no longer any need for analogue adjustment. Seitz: "One of the objectives we wanted to achieve with this project was the reduction of maintenance work, and it has been possible to reduce this by at least two-thirds."



Norbert Kessler



Joachim Gutjahr

Other positive changes mentioned to *ipw* were that the availability of the PM 2 was actually considerably greater now that the number of faults caused by the drives had been substantially reduced, and that the synchronisation and pulling actions of the paper machine functioned much better. The start-up behaviour of the machine was also greatly improved. In short: "We have eliminated uncertainty from the drives", declared Norbert Kessler.

Despite this, he and his colleagues well recall the nerve wracking days and weeks before and during the conversion. One of the difficulties, for example, was the fact that the old concrete foundations had to be cut away and disposed of prior to the conversion. Additional wall openings were created to permit fast movement in and out of the building. However, the precise planning meant that everything went well. The dismantling and erection took place in succession so that when the last drive was removed, it was possible to activate the first new one. Furthermore the entire switchgear was tested from top to bottom in situ in Stockstadt during a one week test phase. "That reassured and enabled us to feel confident that we were already familiar with the plant", said Kessler.

It took just eight days in total to retrofit the drives on the PM 2. 300 people were occupied on the paper machine during the main phase, 80 of whom were working on the drives. Everything went as planned and without accidents, and the plant started again safely. "That was a huge relief", said Kessler. Although one of the ABB commissioning engineers discovered immediately that a motor was damaged, a spare part was procured within 24 h. In the meantime, the paper machine operated with a makeshift solution. The faulty part was subsequently replaced without a problem. Norbert Kessler praised the ABB team in general for their efforts: "They were all specialists and we were very satisfied with their work".



ABB Drive control at Stockstadt

This story might actually have come to a positive conclusion if it had not been for the fire the following year. During Christmas 2009 a fire broke out in the switchgear of the PM 2 that took several hours to put out. The main damage occurred to the wiring, and the central control room housing the control system of the machine was contaminated by smoke. The entire wiring had to be replaced as did 240 UMC22 motor control units and 61 ACS800 frequency inverters. Joachim Gutjahr and his colleagues assumed the planning, implementation, installation and commissioning themselves on this occasion, because it had to be completed very quickly.

"We only managed it because of the great efforts made by ourselves and our staff", said Gutjahr. "What is more we already had experience of ABB devices. We knew from what we had seen elsewhere that these parts could be connected successfully to our site system". Nevertheless he emphasised the support of ABB in supplying the required devices promptly. Therefore this unplanned conversion was also handled successfully, so that we can finally say: all's well that ends well!

Sappi Stockstadt

Sappi Stockstadt GmbH is a paper and pulp mill founded almost 115 years ago. The enterprise has been part of the South African Sappi Group since 2009. Coated and uncoated fine papers for quality art prints are produced at the Stockstadt am Main location. The annual production capacity is 430,000 t of paper and 160,000 t of pulp. The principal markets are Germany, France, Italy and Great Britain.



PM 2 is now running with new drives

For German version:
www.ipwonline.de/stockstadt