

Stora Enso relies on ABB at the world's widest newsprint machine

Client: Stora Enso

Location: Langerbrugge, Belgium

Scope of Delivery: Drive system, process electrification, web imaging, quality measurement, ventilation, installation materials and engineering, installation, start-up, commissioning and training

ABB was one of the main suppliers in the project, and played an important role in completing it in time.



Stora Enso's latest investment, the largest newsprint machine in the world exclusively using recovered paper as a raw material, started at the Langerbrugge Mill in Belgium on May 31st, 2003. ABB delivered a range of automation, electrification, drives and control products.

According to the mill management, the start-up on PM 4 has been excellent. Within 14 days the machine ran for 48 hours without a single break and average production was running at 800-900 tpd.

With a wire width of 11.1 m, PM 4 is the widest paper machine in the world. Valued at approximately 500 million USD it is also the largest single investment that the company has ever made. On reaching full production in two years time, PM 4 will run at close to 2000 m/min and have a capacity of 400,000 tpy.

The "Newslines" production line produces newsprint of 45 g/m².

ABB supplies solutions

ABB delivered a comprehensive range of solutions to the Langerbrugge mill. Choosing ABB as one of the main suppliers was based on the good relationship between companies, but first of all on reliable, experienced technical solutions.



The electrification supply from ABB included the switchgear engineering, related auxiliary systems, connections to the utility company, commissioning, start-up and training. The system consisted of 36 kV GIS switchgear: 37 cabinets with REF545 relays, 36 kV power link 125 MVA, an IS-limiter 1250 A, 6 kV motor control switchgear: 6 cabinets with REM543 relays, a MicroScada network control and monitoring system including control and monitoring of the 36 kV and 6 kV networks, energy reporting and OPC interface with the distributed control system, six 6 kV motors, 620 400/690 V and 500 V motors.

ABB's drive system covers the whole production line from PM 4 to the two winders and the re-winder. It includes a total of 62 drive sections. The system runs and controls the production line via a Control^{IT} control system integrated into the automation system, providing the control precision, functionality and reliability required for the high-quality paper making. ABB delivered all product-related services such as startup, commissioning and training.

For quality control ABB delivered an Industrial^{IT} Web Imaging System and an Industrial^{IT} Quality Measurement System. The Web Imaging System detects and documents both discrete and continuous paper web faults across the entire paper web. The system detects a potential deterioration in the production process at an early stage, therefore guaranteeing high machine availability. Problems that could occur later on in printing full color newspapers, are already identified and prevented during the paper production process.

The Web Imaging System is linked to the drive system and to two ABB Automatic Braking Systems for two winders, increasing their effectiveness by optimizing the time to locate defects for removing or patching. It is controlled through Operate^{IT} Process Portal operator stations installed at the winder and re-reeler.

When the reel is transferred from the pope reel the operator selects the specific reel data from the Web Imaging database.



By noting both the location of the defect and the limitations of the specific winder drive the ABS calculates the optimal speed curve needed to locate the defect. It then automatically slows down the drive to either crawl speed or stop at the precise location of the selected defect. The ABS soon proved to be useful in running the winder, was told by operators.

The Quality Measurement System is used for accurate measurement of all sheet parameters providing extra information for greater and faster control. A consistent surface with a uniform color is crucial for printability. A measuring frame incorporating traversing sensors makes sure that specified basis weight, moisture level and color are maintained on PM 4.

Installation of the main power distribution cabling took place in the busiest portion of the project from February to March 2003. Eighty technicians from ABB carried out the project. They installed cables, cable trays and bridges amounting to a total of 400 kilometers of cables, and 40 kilometers cable trays. Close to 1000 safety switches were also delivered. One major installation included the cable and ducting bridge that connected the machine halls with the power plant.

ABB also supplied the ventilation system for the PM 4 machine hall and de-inking plant, including the supply and exhaust air ventilation and local air extraction for the de-inking plant. In this system soundproof fan units, mounted on the roof of the machine hall, feed cool fresh air down through hollow panels in the wall at intervals along the machine hall and the de-inking unit. At the main working floor level each of these panels has a full width section drilled with hundreds of small holes, some angled, so that the cool air disperses evenly around the machinery and working area without creating a strong draft of air in one place and nothing in others. This system is so effective that when walking along the machine's working level one is aware of the flow of fresh air blowing but it is not immediately obvious where it is coming from.

For Langerbrugge's PM 3 rebuild, ABB also delivered a Quality Measurement System and a drive system comprising of 32 drive sections in total. PM 3 was restarted in December 2002, and a new de-inking unit was started six weeks ahead of PM 4. PM 3 and the de-inking unit served as a very useful test bed for the recycled fiber furnish before it was required for the new machine.

Langerbrugge Mill

In 2002 Stora Enso was the fourth largest producer of standard and improved newsprint in the world and the largest in Europe. Although PM 4 has a design capacity of 400,000 tpy the additional product on the market will not increase by this amount. At the same time as the PM 4 production came to the market, Stora Enso closed a paper machine at Langerbrugge and switched PM 3 (165,000 tpy) from standard newsprint to SC grades.

The Langerbrugge L4 project had some very unique factors that had to be taken into consideration. The feasibility study, to a large extent, concentrated on the latest technology and the local requirements. The project management had to look carefully at the logistics surrounding the existing mill - in the middle of the old, densely populated part of the town - and had to change its whole structure. It meant turning a mill making 350,000 tpy into one delivering 550,000 tpy of product using at least 700,000 tpy of raw material. The new PM 4 uses 100 % recovered paper to produce newsprint. The recovered paper is gathered from the surrounding area, within a range of 300 kilometers. The region has a population of over 80 million inhabitants.

Situated on the west side of the Ghent-Terneusen canal, Ghent is a major industrial port, with a direct connection to the North Sea and Europe's inland network of canals and waterways. It also has close connections to the major European forest industry port of Antwerp.





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