Finnish innovation: Staying in the forefront
SEEING IS BELIEVING

PI was recently invited to visit Cascade’s La Roche mill, around an hour’s drive from Lyon in France. The mill nestles in the foot hills of the French Alps, and is surrounded by rushing rivers and rising, deeply forested mountains - two good reasons for the mill to be sited here 1876. Initially starting out as a pulp mill, the first paper machine was installed in 1925 and the mill now produces around 80,000 tonnes of pulp for its own use, and 140,000 tonnes/yr of high-quality board. The mill was taken over by Canadian company Cascades in 1985.

Over the last three years, the company has seen an impressive 20% rise in production, and an increase in quality that has seen rejects halved – this is made even more impressive by the fact that there has been no major rebuilds on either of its two paper machines, PM 2 and PM 3. Investments that have taken place include a new winder for its PM 3 machine, two new web inspection systems, a complete QCS for PM 2, and an automatic warehousing system.

The two paper machines mainly produce board for the pharmaceutical and food markets where quality is paramount for both visual and contact purposes. The weights produced range from 220-440 g/m² with 80% sold as sheets, the rest as reeis. Jean Noten, technical director at the mill says: “We work in the seriously high-end of the market when it comes to quality, and it is very important that our board stands up to the toughest tests, particularly when it comes to performance on the latest printing machines. Modern presses are becoming ever faster, and customers want to apply more and more processes, including extra colours and embossing, for instance Braille for the visually impaired.”

The production process on the paper machines at the mill involves eight layers or plys on PM 2 and four layers on PM 3 made up of both mechanical and chemical pulp. The machines have had a host of work carried out on them over the years, involving many of the larger suppliers in the industry, including Andritz, Bellmer, Metso and Voith and the mill has evolved into a bespoke provider of specialist board. And being flexible with the ability to change to grades quickly to respond to markets and orders has become a real asset. Noten explains: “Our machines are not the big width, high speed PMs that are popular with the producers of more commoditised grades, our specialisation is high quality coated board, tailor-made to order. Take the pharmaceutical industry for example, where we have a lot of small orders, all of specific grades and weights, here we can often deliver a special order in under a week.”
Around three years ago it was decided that the mill needed to increase capacity, productivity and profitability, but crucially, without any major rebuild or paper machine investment. Noten was brought in to oversee the ongoing evolving projects, he says:

"When I arrived here, I could see the mill had a problem, in fact we had lots of problems. Among them were quality issues. There were a number of differing defects on the board the mill was producing which were not being picked up by the quality systems we had in place and were getting to the customer resulting in a lot of claims. The defects included scratches, holes bumps of the back of the coating and indentation. We had to solve these problems, as they were affecting both productivity and profitability."

The mill did have an inspection system, an ABB Ulma 2000 but it was basic and rudimentary only picking up holes where the light was shining through, all the other defects were still getting through to the sheeters, and then beyond to the final customer. ABB’s account manager in the region, Nicolas Durand, says: "PM 3 at La Rochette mill was originally equipped with an old WIS Ulma 2000 which was only able to detect big holes, which meant all sorts of other defects were getting through the mill, these included starch stains, oil marks, creases, wave formations, lack of coating areas, blade lines and indentations of various kinds".

**TARGETS FOR IMPROVEMENT**

The mill came up with two targets in an effort to tackle the problems that were occurring; to identify the problems and then trace them back and solve them; and to make sure that no defective board got through the mill to the end user. To do this, a more sophisticated web inspection system was needed.

The mill entered into discussions in early 2009 and quickly chose ABB to be its partner in the acquisition, as it had experience with the suppliers’ QCS systems as well as the existing inspection system. "We first sent samples of our defects to ABB’s pilot plant in Finland to make sure that they could provide us with equipment that would be specific to our types of unique problems", says Julien Ravel, machine manager at the La Rochette plant. "We were really pleased with what they came back with, as they were able to identify all the defects we were having on a sheet, and..."
then suggest the architecture we could use that would fit best with our own existing systems."

ABB’s HDI800 web imaging system was installed on PM 3 in late 2009 and was started up at the end of January 2010. The system had to be a sophisticated one to enable all of the defects to be picked up, as well as to map where they were on the winder. The HDI800 system at La Rochette relies on a light and two digital camera beams which cover the whole surface of the web. "Two camera beams are needed because we want ultimate detection," explains Ravel. "We have three monitors, one in the operating room, on the coating station and another in the production office. The monitor displays a map of the reel, and all the defects are marked and colour coded as to what they actually are, for example, spots, holes, or oil marks.

"There is also intelligence in the system," continues Ravel. "If for example there is a defect that keeps reoccurring in the same spot, the system will highlight it, enabling the operator to trace the problem back through the rolls and felts to where it occurs on the machine and eliminate it."

To go along with the web inspection system, La Rochette also installed ABB's automatic braking system (ABS) on PM 3's winder. The mill also installed and inkjet system which is connected to the inspection system and the ABS and winder which then enables a defective area of the reel to be highlighted making sure the defects don't get through. Ravel explains: "Between the two systems, web inspection and the ABS we have an inkjet marker which automatically marks the sheet on the defective area, the information is then fed to the ABS which is able to slow and stop the winder within 1 meter of the exact location of the defect."

Added to this there is yet another system which marks a second time, but in this case the winder does not stop instead the defect board goes onto the sheeters where the marks are read by a digital reader and then taken out of the process at production speed. Ravel says: "All of these systems are fantastic for quality control, and we are getting close to our target of "no defects for the clients".

**START UP CURVE AND LEARNING CURVE**

So was it an easy start up, and did quality improve overnight? "Absolutely not," says Noten. "This is
equipment is not simply as "plug and play", and I would say it took a few months before the operators really got a hang of how to use it. One of the features of the HDI800 is its sensitivity, which is a good thing, and exactly what we needed, but at first it was easy to set it to be too sensitive, so we were rejecting too much. But after a lot of training, as well as fine tuning, we finally began to get results we were expecting.

And what are the results? Has the system helped the La Rochette mill to achieve its two targets - to fix the problems that have been causing the defects and to stop the defects getting through? "Our quality has improved dramatically," says Noten. "The system has allowed us to indentify all sorts of problems along the length of the machine, and fix them, including on the wet end, the size press, the blades and the coating unit. It has also cut customer complaints down now by at least 50%.”

The mill management at La Rochette were obviously happy with the HDI800 and the results the system was achieving, in 2010, ABB received a repeat order for an inspection system on its PM2 machine, and in 2011 the mill also ordered a complete new QCS, also for PM2.

And the bottom line? Noten concludes: "Production has improved dramatically at this mill over the last three years, we have increased production from 140,000 to 150,000 tonnes/yr, and we have dramatically improved our quality, without carrying out any major, expensive rebuilds." PPI