

# PULP PAPER & LOGISTICS

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**KUKA: Robotics solve labelling problems**  
**HEIMBACH: How vacuum capacity influences press dewatering and energy consumption**

**Forest Bioenergy Review supplement with this issue**

# Transparency is key to improving performance

**A project to upgrade the PM10 machine at the Stoneywood fine paper mill of Arjowiggins in Scotland has transformed its operation. Vince Maynard was there to see the project signed off**

**R**eal-time information about the operational performance of any paper-making line is key to improving quality and productivity.

When hardware upgrades were installed at one of the four lines at the Stoneywood fine paper mill operated by Arjowiggins near Aberdeen in Scotland, a parallel project to install state-of-the-art quality-control systems provided new-found transparency into the line's improved performance.

In a collaborative QCS/DCS project with ABB worth £1 million, the improvements to the PM10 machine – capable of sophisticated processes such as watermarking and colour variations – demonstrated how new life can be injected into an already well-established process.

At the end of May, the six-month project was signed off to the satisfaction of development

engineer Ian Kilgour, along with documentation that showed the positive effects of the hardware improvements.

In April, PPL magazine was exclusively invited to witness the outcome of the project. While in the PM10 control room mill operations manager Alex MacAllan entered with charts showing the production improvements, key performance indicators that spoke for themselves. Time taken for a total change was down by 12 per cent; weight and moisture change down by 13.2 per cent; colour change duration 14.3 per cent and an impressive reduction in breaks.

Following the sign off, MacAllan was fulsome in his praise, complimenting ABB for the quality of the project. "The mill is very pleased with the outcome of the project," he said. "It was

a great job very well executed. What is particularly pleasing is how enthusiastic the operations team on PM10 is with the system."

As an example of how the newly-completed QCS/DCS Project offers immediate operational benefits, the way in which it highlighted the outcome of replacing earlier designs of drives was an eye-opener.

Says ABB's Mick Cowdroy, who worked on the project with colleague Nick Evans: "The mill upgraded two old drive units at the wet-end of the machine with two new drive units and linked them electronically to the remainder of the machine drive system, thus allowing all sections of the machine to be fully synchronised and controlled more accurately.

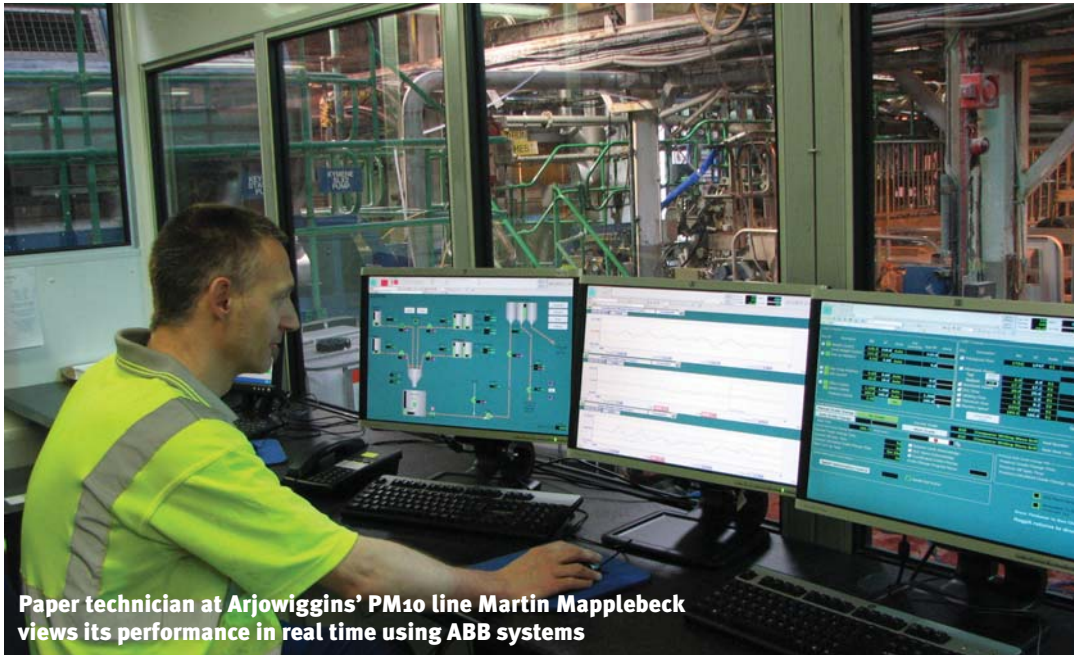
"This allowed the advanced

controls in the ABB system to be fully optimised and generate increased production benefits through more precise speed optimisation control, faster grade, shade and brightness change control, plus fewer web breaks and faster start-up."

The new system replaced a QCS (Accuray 1180) dating from the early 1980s and with a Taylor MOD300 (also an ABB product) was mainly used as a data gatherer for process signal for collating all the machine process data and sending it to the mill's Management Information System (MIS). It was also the interface between the QCS and the MIS as the 1180 was incapable of direct linking to the outside world.

All of the machine's process controllers were 'stand alone' units from a number





**Paper technician at Arjowiggins' PM10 line Martin Mapplebeck views its performance in real time using ABB systems**

of manufacturers: Fisher ac2 (circa 1970s), Turnbull Control Systems (TCS, and eventually part of Eurotherm) were also late-1980s technology. There were two distinct models of single-loop controllers and eight-loop controllers. On top of this there were a few field-mounted controllers plus Refiner KW controllers, all dating from the mid-1990s.

It was decided to replace all of these systems and in addition install slice lip profile actuators (to replace the manually-set ones) plus remove all Start/Stop buttons for the wet end pumps and the like.

Working with ABB on the project was the continuation of a long history of collaboration between the Stoneywood Mill and Accuray/Combustion Eng/ABB since the mid 1970s. Most recent was the successful installation of an 800xA system on the mill's PM08 line in 2009.

Work on the latest project started in the spring of 2010 with Tom and Neil Gordon, of Process Instrumentation Ltd, carrying out preparatory work and then

producing a User Requirement Specification (URS) with input from the mill production team, utilising their extensive knowledge of the older system's functionality.

"The content and quality of this URS enabled the ABB project engineers to programme and configure the control system functions to a high degree of accuracy and ensure an efficient Factory Acceptance Test (FAT). The order was raised in December 2010," said Cowdroy.

With ABB starting work at its Dundalk base in Ireland, pre-installation at Stoneywood included remote I/O panel building, installation of trunking and cabling, re-housing crew's 'bothy' to enable the old one to be re-built as a wet end control room and ABB rack room, all of which was carried out between January and June 2011.

At Dundalk, the QCS Factory Acceptance Test (FAT) was completed in May 2011 by ABB Project Manager Nick Evans and QCS expert Jim Matthews, all under the supervision of Niall Gairdner from the mill's Process

Control Department. Next stage was the DCS FAT which took place at Stoneywood at the end of June 2011 along with ABB representative Lucas Hedl, again led by Gairdner

During the annual summer shut-down at Stoneywood in July 2011 the PM10 was stopped to enable dry testing, followed by wet testing which was completed on a Sunday at the end of month.

The next morning, 1 August, stock tests took until lunch time as steam from the boiler house was raised and at 2pm a sheet went through the machine for commissioning of the drying control loops. By 6pm saleable paper was being produced. The machine ran all night on the same grade and from 8am the next morning the second tuning of other grades began with colour control following a few days later, but ahead of schedule.

Another reason for working with ABB was the size of the scanner. Originally, ABB had suggested a direct replacement of an earlier 'C' frame for a later version. With very little space before the



**The £1m QCS/DCS project at Arjowiggins was signed off successfully in May 2012**

◀ Reel-up Section the options were limited so, after an extensive review of all potential options ABB's Network Platform 700 was chosen due to its industry-leading compact installation footprint. The result made space more available.

This greatly assisted Stoneywood in the mechanical installation of the scanner as major civil and mechanical work would have been necessary to install a Network Platform 1200. Had the NP1200, or similar, been the only option this would have raised the overall project costs (by about £250,000 or 25 per cent) but also extend the shutdown period by up to ten days with a huge knock-on effect due to lost revenue.

As an added bonus, Arjowiggins and ABB agreed to include the

boiler controls within the project scope. This allowed the mill to remove the MOD30 controllers which controlled the drum level and the fuel loops. This has also been a great success.

The overall result has been measurable improvements in net production, saleable paper and mill profitability.

They are the result of Arjowiggins personnel having access to, and having confidence in, much more reliable and accurate information from the QCS 800xA system. The system is also automatically providing faster and more accurate measurements to the control algorithms which in turn are now calculating the required process changes much more quickly and with greater accuracy to get the process variables to target

## Global sweep for creative paper

The Stoneywood mill is one of six in the Arjowiggins creative paper segment with operations in Scotland, England, France, Spain and China. Its papers are made for corporate communication and promotion, luxury packaging, fine arts, bookbinding, speciality applications, casting papers and tracing papers. There are 25 mills in the company's worldwide operations.

The other four segments in the group are:

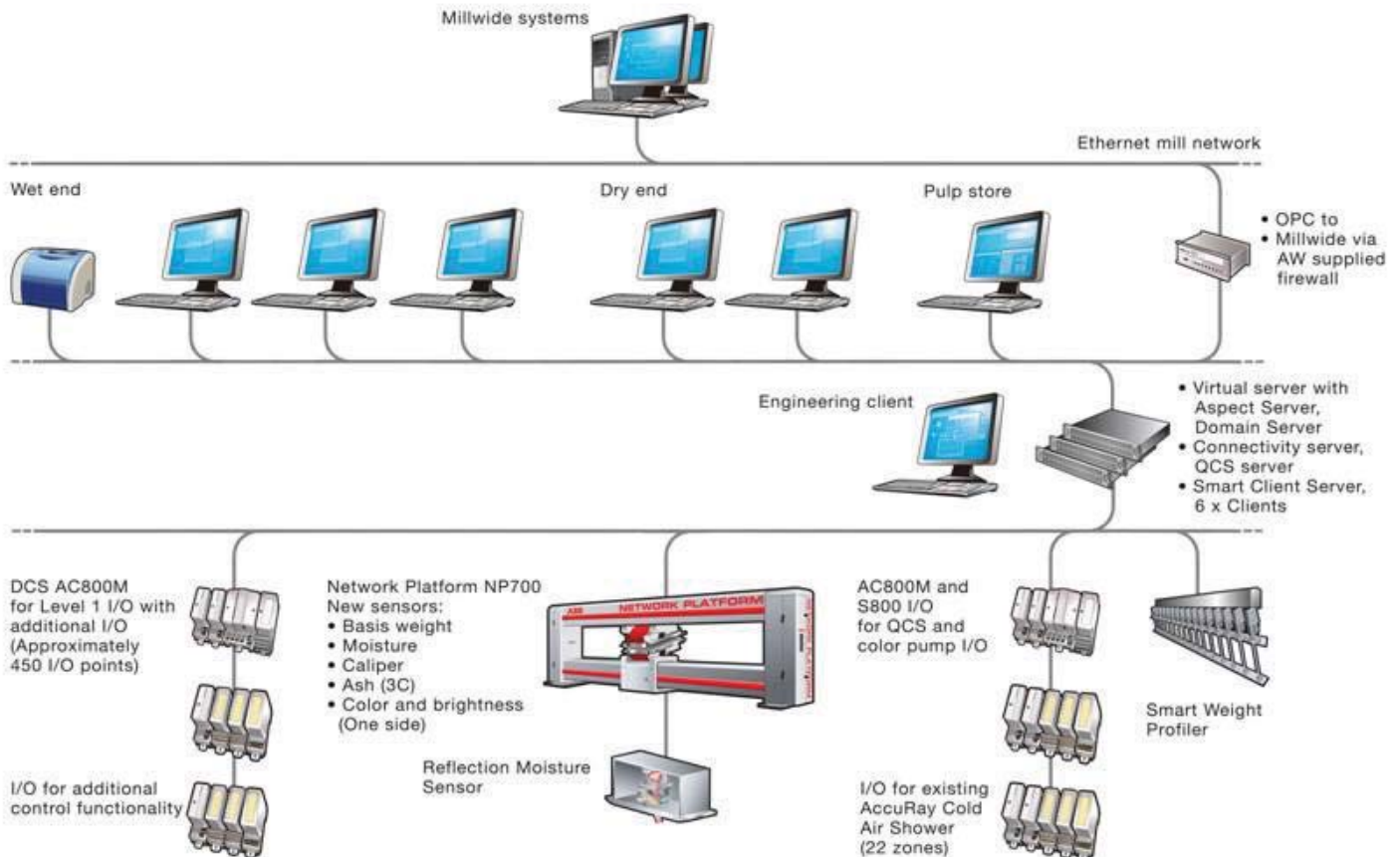
- **Graphic papers:** Coated and non-coated paper, standard or environmentally-friendly, for printing, advertising and publishing, specialty papers, premium 100 per cent recycled pulp
- **Coated US:** Coated paper for traditional and digital printing, specialty products, and unique text and cover products
- **Industrial Solutions:** Papers for industrial applications (abrasives, decorative paper), papers for Medical / hospitals applications (sterile packaging, sterilisation wraps), thin papers
- **Security:** Papers for banknotes and secure documents, e-documents, brand protection, synthetic papers

more quickly than the previous technology would have been able to accomplish.

More information from ABB,

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## AW Stoneywood PM10



Layout of the ABB QCS/DCS project solution for the Arjowiggins PM10 paper making line