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Fieldbus

– ready to bring real benefits?

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To date, major promoters of Fieldbus technology have focused on capital investment savings, since this has enabled easy justification of Fieldbus use on green-field projects. But the early adopters of Fieldbus technology have found that once the initial challenges are overcome, the real benefit is achieved in mill run time: improved production efficiency, rapid production demand changes, flexible control strategy management, information flow, control data integrity, troubleshooting and device performance.

The long-term benefits of Fieldbus are based on increased production efficiency. To start with, standardized control functions mean flexible control for a potentially more accurate response. Fast and accurate control performance, and strategy optimization cut down process variability.

The operator's view of the operation is considerably expanded with Fieldbus, from field devices to enterprise planning systems. Efficient information flow from field devices ensures that the operator can make effective decisions. For example, a traditional transmitter with a transducer fault may continue to give a false signal, the control output is modified in response and the result: waste, recycle costs or additional chemical requirements. With Fieldbus, a status message is enclosed at every control cycle, indicating the validity of the signal. If it is not good then a selector can switch to using the signal from a back-up device.

Fieldbus features a consistent flow of diagnostic data. This allows devices with on-line diagnostics to provide focused maintenance planning, rapid root cause troubleshooting and reduction in shutdown spares usage. Information exchange with the field device is faster and more reliable than previously. Increased flow of information directly to advanced control systems has a strong effect on operational expenditure.

The nature of the Fieldbus lends itself to the addition of extra devices. Due to the reduced number of I/O interfaces, expansion can be achieved within current cabinet structures.

Common concerns

A common concern is how using a bus approach could inhibit redundancy. But when you look at the overall picture, this is unfounded. The higher-level communication layer means a high degree of fault/failure tolerance can be achieved.

Of course higher technology can bring reduced reliability. But calculations to determine the effective time to failure of a sub process reveal that since the number of connections and interface modules is significantly reduced, the overall failure rate is lower with Fieldbus, even allowing for a 30% reduction in reliability. In reality, the selection of the correct device and, in particular, interface components, actual-

With tougher targets, increased demands on efficiency and global legislation on emissions, the last thing you need is a technology change to add to your problems, right? For many, the device management interfaces, manufacturer bias and lack of true interoperability of Fieldbus have caused concern. Well, we just might have reached the stage where the benefits outweigh the challenges.



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ly gives greater reliability and less hidden failures when bus status communication is used.

Good quality training significantly reduces the typical pitfalls of Fieldbus. Approved installers' courses give good guidelines which, if followed, will reduce the early problems. Selection of devices with local keypad calibration aids the transition for maintenance personnel, since they can follow existing set-up procedures.

The key design element to look for is embedded functionality. Many devices rely on associated software for device management and diagnostics. Well-designed devices that are most easily transported between systems embed this functionality using functions such as methods and menus. Look for device vendors that include all control blocks as standard (AO and PID). Also ensure that when you select project contractors or system integration services, you audit their skill capability. Good basic engineering saves much strife in site installation and during the early run time phase.

Most manufacturers support all bus types at least in their system interfaces, so consider carefully which is most applicable for your objectives. The decision over suitability for your application is complex but bear in mind that Profibus has evolved from PLC architectures and offers ad-

vantages in manufacturing system integration, installed base, component availability and relative cost but also some challenges in control engineering. Foundation Fieldbus's strengths are in advanced control strategies, simplified interfaces and potential for greater data flow when taking advantage of field based control. So look for good independent advice and you will find that there will be a bus technology suitable for your mill.

When it comes to buying, remember that proprietary software and system interfaces do not allow best in class device selection. Also, go for simple interfaces: Current plant asset management (PAM) software is over-complex for the purpose. Using complementary skills of support services can be useful to keep your focus on core competencies. This can be particularly important in the start-up phase where previous experience is invaluable.

Fieldbus offers good opportunities for improved mill efficiency and capital cost savings in new projects. So with vertical integration and improved interfaces between bus systems, the time could be right for you to consider it. ●

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Information exchange with the field device is faster and more reliable than previously possible.

Analysis of the Sensodec 6S data has also uncovered the relationship between the paper machine stability and paper quality. Thomas Falkenström of Holmen and Metso's Hannu Rautiainen.



The purpose-driven combination of modern communication technology, sophisticated computer aided diagnostic tools and good old human knowledge and common sense is one of the cornerstones of Metso Future Care. A cooperative process and quality improvement agreement between Metso Automation and Holmen Paper has been implemented on Holmen Paper's new PM 11 paper production line at Hallstavik, Sweden. The PM 11 magazine paper machine with an online Metso OptiLoad calendar was started up in April 2002.

Remote support, local actions

Metso Future Care involves long-term partnership agreements with customers. These agreements, like the one with Holmen, focus on improving product quality and productivity during startup and over a production line's life-cycle. Metso provides the technologies plus the process and papermaking know-how to complement a mill's own capabilities. In a multi-dimensional and widely dispersed company like Metso, many people in different divisions and in different places have specific expertise and experience. Bringing that diverse knowledge together is essential to effectively solve many prob-