Perhaps it is no coincidence that Iggesund Paperboard, a world-class producer of high-quality bleached board, is also a world leader in predictive mill maintenance. Preferring to take a proactive, rather than reactive, approach to maintenance, the Iggesund mill in Northern Sweden was among the first to install Metso’s FieldCare software for operation and monitoring of intelligent field devices. The success of the systems, the first of which was installed five years ago, has now led the mill to make Smart valves and FieldCare standard equipment for all new installations and rebuilds.

“Since we first installed this diagnostic tool, we haven’t had a single breakdown on the lines using it,” explains Peder Hägglund (on the photo), who is now the maintenance manager for the automation department in the boardmill. “It helps us to be much further ahead of things with respect to the condition of critical field devices like the valves. Since we know the condition of these devices and the trends, we do less unnecessary fire fighting. It allows us to separate the true areas of concern from the false alarms.”

First system installed in 2000

The first line to be covered by the FieldCare system was the new evaporator line that was built in 2000. As part of that initial installation, essentially all of the control valves on the evaporator line were equipped with ‘Smart’ digital valve controllers which have a built-in diagnostic function for on-line monitoring. This would not be possible with analog valve controllers.

The software was added as part of the valve package that Metso Automation delivered. Iggesund, under the guidance of Hägglund and valve engineer Tommy Nielsen, began to test the capabilities of the system. They quickly realized that it was a very valuable tool.

This system was of interest to Iggesund as part of the mill’s ongoing program to be more proactive in maintenance. The old, traditional method of maintenance had been simply to wait until a valve broke down or the operators noticed something going wrong. Several years ago the mill moved to a more systematic program of valve inspection, with the instrument men doing rounds to check the valve condition. But this was somewhat limited by the fact that the process needed to be shut down when the tests were performed meaning the results reflected a ‘dry’ test, rather than the state under true operating conditions.

The initial system on the evaporator line consisted of 32 control valves being monitored by previous Neles condition monitoring system, the Neles FieldBrowser, via a HART multiplexer which systematically moves from valve to valve on a regular schedule to check the condition. This polling of the Smart valves is carried out continuously.

In addition to the continuous real-time condition monitoring function that the system provides, it also is set up to automatically maintain an historical database of the individual valve data, so that the history of the valve can easily be called up. This can be very useful when trying to analyze the performance of the valve or see if there is some history which can indicate other problems.

Close to 500 control loops covered

Following the successful installation of the Neles FieldBrowser in 2000 on the evaporator line, the mill then decided to put similar equipment on both of the board machines in 2001-2002 as well as the chemical and coating preparation line on BM1 in 2004. This was followed by the steam and power systems in 2003, and the new recausticizing line in 2004. During 2005 the washing and screening systems in the pulp mill will add FieldCare as well. This means approximately 500 control loops will be included as of this year.

Hägglund and Nielsen are pleased with the insight that FieldCare has given them into the field devices. As far as device configuration and condition monitoring, the on-line system has provided a completely different way of approaching items such as valve maintenance.
“This has really changed our standard routines, giving us much better insight,” says Valve Engineer Tommy Nielsen. “We now have remote diagnostics and programming capability which saves us lots of time, effort and running around. Our daily routine is much more planned and efficient. Travel deviation on the valve positioner is the item that we watch most closely. Each day we check the status monitor for any problems. We get a warning at 2% travel deviation and an alarm at 4% deviation. But that doesn’t mean we have to run out immediately. The key thing we look for is a worsening trend, which indicates a potentially serious problem.”

The new standard: Smart is intelligent

Perhaps the most convincing proof of Iggesund’s trust in the intelligent field equipment and on-line monitoring software is the fact that it is now standard equipment for all major projects. Hägglund comments: “We consider intelligent field equipment and on-line monitoring to be our mill standard on all new projects or major rebuilds. The mill management is fully convinced of its value which means we don’t have to fight for it when it comes to budgets. That certainly makes things easier for us, both in terms of getting funding and carrying out valve maintenance programs.”

The benefits that Hägglund and Nielsen notice are numerous. First of all, rather obviously, they can see the field equipment status on-line in real time. They have observed a clear correlation between this capability and reduced process variation and upsets, reduced consumption of raw material and energy; and higher quality of finished product. In addition, they both feel that valve maintenance is now being done exactly when it is needed, meaning it is neither too early nor too late. “We don’t have valve breakdowns or emergency stops in the equipment covered by the on-line monitoring system,” says Hägglund. “In addition, we are using our manpower much more effectively. It is hard to argue with that.”

Other advantages that Hägglund points to are the value in monitoring of equipment that is rarely shut down such as the plant or boilers, finding serious valve faults besides travel deviation; troubleshooting; better sizing of valves and a more pleasant working environment due to remote access to valve information.

A benefit for customers as well

The on-line monitoring and intelligent field equipment system has even been shown to paperboard customers as a further proof of the Iggesund’s commitment to ensure that they get the right quality at the right time. “I think it says a lot that this maintenance tool has been included in presentations to customers,” comments Hägglund. “We think that this is an important aspect of our total quality control. Seeing problems before they become serious helps us assure customers that they will get the tonnage they need at the right quality and right time. It is a small but growing part of the high-quality image that we have.”

By using this advanced system to its full advantage, Iggesund has been able to smooth operations, reduce breakdowns and make more consistent quality products. Concludes Nielsen “It’s a very useful tool that gives us a much better understanding of the processes which are being monitored by it. I have been turning valves for years but now there is a much better, faster, more accurate and pleasant way to do it. It makes my job easier and more fulfilling. This also has a certain appeal and value in our efforts to recruit new talent from the younger generation to the mill.”

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