

New Investments in Process Control Key To Higher Productivity, Cost Reductions

Spending for process automation has slipped against information technology in recent years, and aging mill systems are now approaching obsolescence, especially in the U.S. — *By KEN PATRICK, EDITORIAL DIRECTOR*

The prolonged downturn in the paper industry, especially in North America, has taken a serious toll on several process segments. The chemical recovery island/boiler complex and the woodyard, for example, are areas that have received little attention and almost no capital funding in at least a decade. The chemical pulp mill itself has also been generally neglected, along with waste treatment, since the Cluster Rules fizzled to an anti-climax in 1997. In fact, North American paper machines, especially in the U.S., haven't been exactly pampered with new-technology makeovers lately.

But possibly more devastating to the industry as a whole, because it crosses over and impacts all segments, is the lack of attention and make-do attitude of the industry toward process control in recent years. Lack of spending for process automation has left the industry limping along with aging control systems that in many cases are at least technologically if not functionally obsolete. What little automation money has been allocated in recent years has gone increasingly for information technology.

Ole Fadum, president of Fadum Enterprises, points out that as much as \$5-7 billion worth of process control equipment in the paper industry could now be obsolete. By practice if not policy, many companies today do not replace process control equipment unless spare parts can no longer be found.

"We've heard warnings the past five years that spare parts are not going to be available for some of the older systems. Finally the time has come that spare parts really are no longer available. There are stories of companies buying old systems from their competitors just to have

spare parts for systems that were obsolete many years ago. The irony of this is that in a down market, such as the industry is currently in, quality and production costs become critically important. And process control is the key to improving both product quality and costs," he insists.



Ole Fadum

According to Fadum, increased spending on information technology is related to a paper industry trend away from manufacturing as a core competency. "Generally, many paper companies believe they are doing about all they can in regard to manufacturing. They feel that if they are to make their companies more profitable, they have to look in other areas, such as the supply chain and customer service. Thus spending has shifted more towards supply chain management systems, ERP systems, and customer relationship management systems," he says.

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At the same time that IT has become more important in the paper industry, Fadum says there has been increased interest in asset optimization. This can be done at the corporate level with asset tracking, purchasing and stores applications. "But most of the paper industry's assets are at the mills," he says, and to optimize mill assets will require increased automation spending.

"When you see large paper companies spending as much on an ERP system as they normally would on a paper machine, you have to wonder what's going on. But I believe paper companies will begin shifting interest back

to manufacturing in the near future, and that later this year or in 2004 there will be increased investment in the mills again, especially for process control. There has to be, to protect and optimize their assets," Fadum concludes.

Quality, Efficiency, Costs



Niel Casale

Niel Casale, senior VP, North America, Process Automation Systems, Metso Automation, agrees that "a lot of process control equipment in the paper industry today isn't exactly state-of-the-art." He says, however, that generally the older systems are meeting the short-term needs of some paper

companies. "It seems many companies are trying to do basically three things with what they have—improve or maintain quality, keep efficiency as high as possible, and cut costs wherever they can. They're not too interested in increasing production right now due to depressed market conditions."

Casale also points out that companies have cut back on technical resources, so obtaining efficiencies and quality through optimization, even with current systems, now requires outsourcing to automation suppliers. Metso Automation, he says, is addressing this through continuous life cycle management and its Future Care business concept.

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In addition to the totally new systems for three new paper machines in Canada, Metso Automation does have a considerable number of quality control types of projects on its North American order books, according to Casale, such as web inspection systems, profilers, actuators, etc. "Not many companies are upgrading big control systems at this time, but there seems to be an abundance of these moderate level projects designed to boost efficiency and quality or reduce costs."

According to Jeff Long, director of marketing, North America, Process Automation Systems, Metso Automation, there really hasn't been any "gang buster" reasons for increased investments in process control in recent years. He notes that the high growth and fast pace of automation applications during the 1970s and 1980s, followed by major developments in CD controls, actuators, etc., during the 1990s "created some easily justifiable reasons to invest. Overall, the technology has continued to get better, but lately there just haven't been any 'killer' things to boost investments. So many mills have opted to limp along with existing capabilities for a while."



Jeff Long

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Long notes that "we are seeing some tapering off on the IT side now. IT sort of went along with the high-tech movement of the 1990s, but now the industry appears to be trending back to control basics again. Classic control is still very valid in terms of investment, quality, productivity, etc. What we're hearing more and more from our customers is 'show us how to reduce costs.'"

Paul Steinitz, director of marketing, Foxboro Automation Platform, Invensys Foxboro, adds that from a production perspective, there has been a reduction in the level of control complexity. "Advanced controls that were going on 10-15 years ago just aren't happening right now. Money that was being spent there is now being spent to push information up the chain. But I believe there will be a rubber-banding effect, i.e., the industry will again realize there are real savings to be had and that we can run our plants and mills much better through improved process control."

Steinitz adds that the big push in process control 20 years ago was to reduce product variability. Today it is more of a throughput issue—how efficiently can we run...can we cut back on raw materials rather than

improve quality, etc.?" "It seems that the quality problem has been more or less solved today. If so, I would hope there will again be some thrust or emphasis on developing data not just about the mill, but the mill's performance (are control loops properly tuned...can we put more loops on automatic control, etc.?)."



Roger Evans

As Roger Evans, marketing manager, Pulp and Paper, Invensys Foxboro, explains, both quality and cost competitiveness are key drivers in today's globalized paper industry. "In an overly supplied market, reducing costs or improving operating efficiency is probably the major

opportunity, especially compared with increasing production or even improving quality for that matter. Some mills could argue that if they can sell everything they make, why worry about improving quality? But, of course, it's not that simple.

"The interesting fact is that both efficiency and quality can be improved at the same time," Evans continues. "It's possible to justify a control project for the bean counters in terms of reducing costs, while improving quality to help sell products more reliably and possibly at a slightly higher price. There are many such opportunities in today's integrated pulp and paper mill."

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Ron Powell, VP/GM, Pulp, Paper and Printing, Honeywell, points out that the degree of process control obsolescence in the paper industry varies by geography. He notes that the problem is more acute in North American than in Europe and other parts of the world. "Currently producers in Europe are doing a better job of putting some discretionary capital toward maintaining their processes and investing in process control. For various and different reasons, the Chinese and Asian paper industry is currently

playing a leadership role in the automation and control area," he says.

Recent consolidations and globalization have had and will continue to have a significant impact in North America, according to Powell. A rationalization of assets is taking place at some of the larger players that are emerging from these consolidations, which will lead to decisions to invest here and not invest/shutdown there. As these asset rationalizations are completed, there likely will be increased investments.



Ron Powell

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Powell adds that after the consolidations and asset optimizations currently going on, "whatever is left of the North American paper industry will have to be 'world class.' It will have to be able to perform favorably in comparison with operations anywhere in the world. Otherwise, it will be up against their imported products. Productivity is the key going forward. There's no doubt."

Anders Kornblad, VP of global marketing, Pulp & Paper, ABB, points out that the ROI for completely replacing older DCS (distributed control systems) of the 1980s and early 1990s is low. "So we don't expect a return to the high spending levels in North America of the past, given the limited number of greenfield projects here."

Kornblad notes that the situation is somewhat similar with QCS (quality control systems), adding, however, that there are much stronger obsolescence drivers involved with this side of the control arena. "QCS is fairly hardware intensive and involves a lot of equipment out in the machine area environment. These systems need to be replaced every 8-12 years. It's very hard to live without QCS, or even to live with poorly performing QCS equipment."

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Anders Kornblad

Strategies, Trends, Outlook

Kornblad explains that ABB's IndustrialIT strategy for growth beyond the minimum obsolescence replacement business is focused more on HSI (human-system interface) technologies.—“putting more efficient tools in the hands of opera-

tors that will help them make faster and better decisions.” He says that other emerging market areas include the development of concepts involving “data mining”—e.g., utilizing existing data not just as process historians do, but putting in some new functionality that perhaps draws from a mill's existing process historian and creates new decision support capabilities.

For example, Kornblad says that ABB has been working “quite aggressively” in the pulp mill area to develop new optimization strategies. “In some regards, a large pulp mill can be like an open sea where things are poorly optimized, even though on a balanced level. By applying clever algorithms to available data, we have been able to come up with some improved operating strategies that enhance the bottom line quite significantly. Going forward, we expect to do the same thing with paper machines as well as other process segments.”

Kornblad also says that in regard to HSI technologies, another recent trend is the use of mobile wireless interfaces such as PDAs, small laptop computers, etc., in pulp and paper mills. “This is already going on in Scandinavia,” he reports. “These systems effectively put the screen-based systems of a control room in the hands of an operator walking around the mill. However, this increases the need to integrate automation with maintenance and other control room functions.”

Historically mills have pushed for higher degrees of integration, to have as few screens as possible—if not a

single screen operation—in the control room, Kornblad continues. “The wireless interface more or less mandates a higher level of integration, because if there are several control systems—drives-QCS-DCS-PIMS, etc.—it becomes impractical to carry around multiple mobile units. Control integration and the use of wireless, mobile control units is progressing rapidly in Asia as well as Europe and Scandinavia, and it will soon come to North America in a big way.”

Powell emphasizes that to stay viable and productive, mills must have a path forward with their control systems. “Eventually you have to get off of these old platforms and move to something that's sustainable. Today's systems and technologies are a lot more capable and there's considerably more functionality we can deliver to a mill. But fairly high bandwidths, networking, etc., are needed to be able to take advantage of this—and the older systems simply don't allow it.

Evans explains that there have been some new sensor developments for the paper machine wet end in recent years—charge sensors, retention measurement, etc.—that are significantly improving performance. Stock prep to the headbox, which is essentially being handled by cascading controls, also represents a significant new opportunity, he notes. “Any improvements in stock prep, particularly in regard to grade change, tend to stabilize the machine and read right across into performance at the reel. Foxboro has applied multivariable controls very successfully in this area. There is a lot to be gained there.”

According to Evans, “the question for today's paper industry, especially in North America, is how do you liberate capital to modernize mills and make them truly cost competitive? The bottom has been reached now in terms of the industry's investment in process control, and there's actually a great opportunity shaping up to replace some of the \$5-7 billion worth of obsolete control equipment out there. There's certainly some opportunities in the chemical recovery areas as well as energy in general.

“It's not going to be a dramatic turnaround, but it's going to come gradually and surely. Although capacity has contracted 10 million tons in North America in recent years, there's still a lot left—a lot of opportunity,” Evans says. ■