From the Director

By Paul Burnett

Honorable Members of PUPID,

My name is Paul Burnett, and I look forward to being your new Division Director for a two-year period beginning January 2010. With your support, my aim will be to increase membership of PUPID and bring you the benefits you expect as participants in our Division.

On behalf of us all, I extend thanks to Eugene Sabo, whose term as Director ends in December. Gene kept the Division intact during the period when we lost our prior multi-term Director, Brad Carlberg, to a secret Middle East mission. Brad has now returned to the States and I had the good fortune to meet him at the Fall Leaders Meeting in Houston, where he agreed to continue managing PUPID’s extensive website (www.isa.org/~pupid) and editing our Newsletter.

Providing you with helpful technical and industry-related articles via PUPID’s Newsletter is a priority, and in the fall edition you will find:

- an interesting commentary from Dave Strobhar (Beville Engineering) about the benefits to be derived from more automation in pulp and paper mills
- an intense article by Gilles Dorris (FP Innovations/Paprican) on potential cost reduction benefits of a new air content monitoring system used in de-inking and other processes
- Michel Ruel’s (Top Control) full article on asset management/performance optimization at a White Birch Paper mill
- PwC’s earnings round-up for Q2, 2009, which shows wide company-to-company performance variations. I will e-mail Q3 earnings results when they are available

We welcome your polite responses to these articles and suggestions for future articles and who should author them. Send them to Brad Carlberg (brad.carlberg@bsc-engineering.com) and/or to me (paulburnett@att.net).

We are fortunate that the Fall Newsletter also carries an article by Leo Staples, the future President of ISA, who, in the first instance wrote his article specifically for you, the members of PUPID. I hope it is an encouragement to you to become more involved with the Division and to enroll more members from the great international pulp and paper community.

ISA EXPO 2009 Attracts Thousands, Features Dozens of Special Events

ISA EXPO 2009, held at the Reliant Center in Houston, Texas, USA, on 6-8 October, attracted 8,500 attendees and included a 61,500 square foot exhibition showcasing 364 companies. The ISA Fall Training Institute ran 13 courses and trained 113 students at the event.

ISA EXPO 2009 featured seven co-locating organizations, including ARC Advisory Group, Industry2Grid (I2G), MCAA, OpenO&M, Microsoft and the Microsoft Manufacturing User Group (MSMUG), Houston SmartPlant Instrumentation (LTUF), and WBF.

The co-location of these organizations’ events with the ISA Fall Training Institute, Industry Standards Forum, six technical conferences, and the exhibition brought an abundance of technical content, professional development, and networking opportunities to attendees. New technologies were a focus of both conference sessions and presentations on the exhibit floor, with attendees anxious to see the latest trends in the field. “I’m always looking for new technology. That’s what I’m here to see. I’m a control systems engineer, and anything that can make our processes work better, whether that’s software, wireless, or fieldbus, I want to have a look,” said James Pitts of Goodyear Tire and Rubber in Beaumont, Texas.

The ISA EXPO 2009 technical conference featured six Exchange Conference Tracks centered on key issues facing instrumentation, automation, and control professionals, including safety, security,
The second annual iAU2M8 event, designed for middle and high school students, attracted over 600 students from the Houston area. Students had a chance to walk through the ISA EXPO exhibit, see automation technology in action through an interactive demonstration area, and learn about career opportunities from real-world automation professionals. Sponsored by Shell, the event attracted several participating organizations and schools, including Citizens for Affordable Energy, FIRST Robotics, Houston Community College, the Houston Museum of Natural Science, Lee College, the Offshore Energy Center, Texas State Technical College, and the University of Houston.

The students attended a keynote address entitled “Deadliest Innovation,” given by Greg Crouch, Embedded Systems Business Development Director at National Instruments. Crouch is active in National Instrument’s academic STEM (Science Technology Engineering and Math) program efforts, helping to expand excitement of engineering among youth.

During ISA EXPO 2009, ISA announced its plans for a new event in 2010. ISA Automation Week 2010 will be held 4-7 October 2010 at the Westin Galleria Complex in Houston, Texas, USA. ISA Automation Week is a new, knowledge-focused event that will feature educational and applications-based technical conference sessions delivered by subject matter experts. Discrete and process automation professionals will have a chance to learn techniques and solutions for creating more efficient, productive, and economical manufacturing processes. ISA training courses and standards meetings will also be held concurrently, making ISA Automation Week a one-stop shop for automation and control knowledge and networking opportunities.

ISA Automation Week will attract management, engineering, production, IT, and R&D professionals responsible for automation, control systems, plant-wide communications/networks, plant operations and maintenance, and systems integration in continuous and batch manufacturing environments.

process automation and control, energy and environment, wireless and networking, and enterprise integration. The conference program also included several events open to all attendees, including keynote addresses from key leaders. John Hofmeister, CEO and Founder of Citizens for Affordable Energy, and retired President of Shell Oil Company presented the opening keynote address on Tuesday, 6 October. Hofmeister’s presentation, entitled “Energy Security and Affordability in the 21st Century,” tackled these two critical concerns for industrial operations.

Wednesday’s keynote address, “Securing the Nation’s Industrial Control Systems Infrastructure,” was delivered by Marty Edwards, U.S. Department of Homeland Security Program Manager of the Control Systems Security Program (CSSP). Edward’s address discussed the current threat landscape, common vulnerabilities and security issues facing critical infrastructure control systems, and mitigation strategies being developed to address these challenges.

Lisa Long, Safety Engineer with the U.S. Department of Labor-OSHA (U.S. DOL-OSHA), presented the final keynote address on 8 October, titled, “Overview and Findings from OSHA’s Refinery and Chemical National Emphasis Programs.” Long’s address described the Petroleum Refinery National Emphasis Program’s inspection protocol and procedures, and reviewed preliminary findings from the program, including data on the most frequently cited paragraphs of the process safety management standards and example citation language.

The event also featured activities for young automation professionals and students, YAPFEST, in its fourth year, attracted 200 automation professionals in the under-30 category to interact with sponsoring companies, learn more about careers in automation, and discuss how they might make a difference in the automation world. Students from several local colleges attended the event to learn about real-world applications of the automation and engineering concepts they’re learning about in school, and young professionals already working in the field attended to network and build their knowledge of the industry. Tamara Freasier, a graduate of LIT, works as a commissioning admin for Chicago Bridge and Iron. “We’re building a liquid natural gas plant in Sabine Pass, Texas,” she said. “I came to EXPO to get exposed to instruments and what they do.”
ISA recently unveiled plans for its new event, ISA Automation Week: Technology and Solutions Event, to be held 4–7 October 2010 at the Westin Galleria Complex in Houston, Texas, USA.

ISA Automation Week will feature intensive educational and applications-based technical conference sessions delivered by subject matter experts. Discrete and process automation professionals will have a chance to learn techniques and solutions for creating more efficient, productive, and economical manufacturing processes. ISA training courses and standards meetings will also be held concurrently, making ISA Automation Week a one-stop shop for automation and control knowledge and networking opportunities.

The ISA Automation Week conference program will focus on the latest industry developments and standards in key manufacturing disciplines like automation, energy and power, green manufacturing, instrumentation and process control, safety and security, systems and enterprise integration, and wireless, networking, and industrial communications. Conference sessions will include both theory-based and applications-based presentations to appeal to a wide variety of automation and control professionals. The event will feature a focused exhibition area for a limited number of companies to showcase products and services during scheduled networking and exhibit sessions. Currently, 65% of the space available for the exhibit has been sold.

"ISA Automation Week is organized around a different model than ISA has used in the past. The new model focuses on the conference as the center of the event, because we believe that automation and control professionals at every level seek knowledge above all else. By centering the event on the conference, we can help exhibitors create more successful interactions with serious and focused attendees at all levels," said ISA Executive Director and CEO Patrick Gouhin.

"ISA is all about knowledge. The conference focus of this event will help us deliver a top-notch technical curriculum to our attendees, and it will benefit our partners and exhibitors as well," said ISA Automation Week Program Committee co-chair and 2009 ISA President Jerry Cockrell of Indiana State University. "By drawing on our connections to the academic community to develop presentations in addition to our strong applications-based technical network, we can create a well-rounded program that attracts all levels of automation professionals."

The increased focus on the conference aspect of the event is a positive development for automation suppliers as well, said 2010 ISA President Nelson Ninin, who is the President of Yokogawa America Do Sul SA. "We believe that an educated prospect is a qualified prospect. Our attendees will spend three intensive days learning about the latest technologies and solutions in the world of automation and control, and they'll be ready to see the products that our partner companies have to offer in those areas. This is a great opportunity for a company to showcase its products as solutions to the technical challenges and developments presented in the conference sessions."

An Exhibitor Advisory Committee and other feedback mechanisms are being created to solicit input at various stages of the development process for the 2010 event and events in future years. Companies or individuals interested in learning more, or providing input toward the development of ISA Automation Week, should contact ISA at feedback@isa.org, or call +1 (919) 549-8411.
ISA Division Members: Top Three Opportunities to Contribute to ISA’s Success in 2010

Like most companies and organizations, ISA has faced economic challenges in the recent months. Our 2009 President, Jerry Cockrell, and our 2010 President, Nelson Ninin, have worked with the Society’s leaders to create a more sustainable business model for ISA’s long term success. I have been part of this process as the 2010 President-elect Secretary, and I am looking forward to all of the opportunities that these changes will bring to our Society.

ISA has made great strides in 2009 with our leadership role in the development of industry critical standards like ISA99 and ISA100; in our support of the development of the Automation Competency model; and in our outreach to young automation professionals through workforce development initiatives such as YAPFEST, iAU2M8.09, and the Automation Avengers campaign.

As Division Members, each of us has a unique role in ISA’s success. We are the technical arm of the Society, and we have much to offer in that regard. In fact, many of the changes we’re making call for an increased focus on technical content, and Division Members will be critical resources in this effort.

During my twenty years of membership I have been involved in many worthwhile activities. From a Society-wide perspective, I think there are several key roles for Division Members to play in our development. Here are my “top three” ways that you can make a real difference in 2010:

• Help ISA enhance the development and delivery of technical information. In the new Automation Week model, the technical conference is the center of the event and will be a great opportunity for our Division Members to present papers and presentations to a broad audience. In addition to submitting an abstract for the conference, you might also consider becoming a part of the conference programming committee. 2009 Industries & Sciences Department Vice President and Former Division Director Joe Provenzano (Water and Wastewater Division) and 2009 ISA President Jerry Cockrell will serve as co-chairs of the committee. Email (Jerry at gcockrell12@msn.com or Joe joe_provenzano@hotmail.com) to volunteer or to learn more about the committee’s work. In addition to Automation Week’s technical content, Members will also be more involved in creating technical content for ISA’s flagship magazine, InTech. Stay tuned for details on how you can share your expertise as we develop our plans.

• Do your part to promote the profession and tell the great stories that are out there. ISA organizes all kinds of events for young professionals and students, including YAPFEST and iAU2M8. Learn more about these events online and volunteer to help develop them through our workforce development committee, led by David Adler (davidadler@comcast.net).

• Help spread the word about ISA’s education and training opportunities. ISA’s certification programs, regional courses, distance learning programs, and onsite training classes increase the competence of automation professionals around the world. We need your help to market these great programs to the companies and individuals that you work with everyday, and we need your input to help us develop the next generation of training courses. We look to you, the professionals in the field, to help us determine the best subjects and topics to develop training courses around, and we want to hear your thoughts. Download a training catalog online at www.isa.org/training to learn more about these programs.

The common theme among these three opportunities is for us as Division Members to bring all of our collective value to the table to move ISA forward. We are a tremendous resource and strength within the Society, and I want to help each and every Division Member find the best way to make a difference within ISA. I look forward to continuing this dialogue in the months and years to come.

H. Leo Staples, Jr.
Power Industry Division and Test Measurement Division Member
POWID Executive Committee Member & 2009 POWID Symposia General Chair
2010 ISA President-elect Secretary
Maximizing Automation Benefits in Pulp & Paper Mills

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In the last century, if a person said we are doing an automation project at our pulp or paper mill, a reasonable response would have been, “So you’re upgrading your control system.” Instrumentation upgrades and automation were frequently synonymous, if not interchangeable. The results were usually better than expected, with tighter control to set-points and the ability for more complex control schemes to increase efficiency and profitability. However, technology has continued its inherent progress forward. Automation has become more than instrumentation upgrades. It is not that improved control systems are no longer worthwhile. On the contrary, in addition to their previous benefits, they provide a platform for advanced control schemes and enhanced data collection for process analysis. It is automation that has expanded in its ability and scope, increasing the integration between the human and machine for safer, more reliable, and profitable plant operation.

The machine side of automation can be seen in the application of safety instrumented systems (SIS). Highly reliable devices take the guesswork of preventing a plant from operating in an unsafe manner. The decision on when to shutdown all or part of the plant is done in the calm of a conference room with a team of specialists, rather than in the chaotic moments of an upset at 3 AM by newly qualified operations personnel. While the primary function of the SIS is to prevent unsafe operation, it has other beneficial aspects. Since the SIS responds rapidly and reliably, the process can be operated with more confidence closer to its limits. Field personnel are no longer the primary means to implement safety related actions, with isolation valves going to their desired positions in the first few moments of an incident, the field operators now become a backup layer to the SIS. This has implications for how the field positions are staffed.

The human side of automation can be seen in the changing role of operators. The console operator becomes more of a process supervisor and less of a process controller. With fewer detailed interactions, the console operator can oversee more equipment and systems. This creates tremendous opportunity to alter overall operation for enhanced safety and productivity. Those parts of the plant which interact or compete for common resources can be placed under the control supervision of one individual, reducing the natural lags in the system and enhancing response time and accuracy. Without the need for everyone to rotate through the console position, field personnel can become more specialized, focusing on rotating equipment, instrumentation, etc. The net result is a plant that operates in a significantly different manner than it did before.

The integration of the two sides of automation is the realm of the interface. The console operator is no longer watching for a high level in order to start a pump. They also have more equipment than before to deal with. Enabling the change of role with increased span of control requires different tools for the console operator. Displays need to present information at a higher level, providing a wider view of the process by abstracting away the non-critical process variables. Qualitative information (good/bad) becomes more important, while the quantitative (150 DEGF) becomes less so. DCS programs to take parts of the process to stable, non-shutdown states, thereby enabling the operator to better concentrate on any problem at hand, become critical to ensure that the operator does not become overloaded. Similarly,

Without the need for everyone to rotate through the console position, field personnel can become more specialized, focusing on rotating equipment, instrumentation, etc. The net result is a plant that operates in a significantly different manner than it did before.

warnings need to be managed such that the operator is alerted to problems he can resolve, not just changes in the process. Automation in the 21st century has moved beyond instrumentation upgrades. Perhaps this is best epitomized by the change of the Instrument Society of America to the International Society of Automation. Maximizing the benefits of automation to a pulp or paper mill requires a similar refocus. Automation is more than instrumentation. If done properly, it is a tool to recast your mill for the operational safety and efficiency that the new century demands.

Make a difference in someone’s life—become an ISA Mentor

Are you an ISA Member who is interested in helping others in the automation profession? Sharing your expertise is a great way to make a difference in another person’s life.

Become an ISA mentor!
Join ISA’s Mentor Program and help a young professional Member or an ISA Student Member in his or her career. Learn more about this online program at www.isa.org/mentor.
ABB Helps Stora Enso Break Records In Paper Mill Productivity

Zurich, Switzerland (3 November 2009)—A complete ABB automation, power distribution and electrification solution is enabling a mega-size paper machine to break world speed and productivity records while minimizing power consumption in this, one of the world’s three most energy-intensive industries.

Following ABB’s handover of the composite plant solution for the PM12 paper line at Stora Enso’s Kvarnsveden paper mill in Sweden in 2005, the machine has twice set new world records for speed and productivity in the past four years.

ABB’s solution includes more than 45 variable speed drive systems, high efficiency motors, other power distribution and electrification equipment, and System 800xA Extended Automation for process and power system control. With a capacity of 420,000 tons, PM 12 is the world’s largest paper machine for the production of supercalendered paper like newsprint and uncoated-edged paper.

The machine set its first world record of 1,901 meters per min in 2005 and extended the record to 1,926 meters/min during a 24-hour period in January 2009. Machine speed determines mill productivity and annual production capacity. A key factor in raising and maintaining the high velocity of PM 12 is the 45 ABB variable speed drive systems that speed-control the process with exceptional accuracy. Each of the drive systems has to operate at a different, yet coordinated and highly precise speed. If they don’t, the web (paper) will break, reducing productivity and impairing product quality.

Energy efficiency begins with a well-designed power distribution and electrification system. The 45 drive systems are part of a large ABB Composite Plant Solution for PM12 – an all-in-one package in which ABB acted as EPC (engineering, procurement and construction) contractor and provided a complete power distribution and electrification solution including engineering design, construction, integration of all products and systems, as well as commissioning.

The package was one of the largest that ABB has delivered to the pulp and paper industry. Hundreds of ABB variable speed drives and high efficiency motors—as well as fine-tuning of the power system at each stage of the process and precision control by ABB’s award-winning System 800xA control system—ensure that the mill’s energy consumption and greenhouse gas emissions are falling year-on-year, and are among the lowest in the industry.

Over the years, ABB has supplied many Stora Enso pulp and paper mills with extensive power and automation solutions that improve the efficiency and productivity of the company’s operations. Most recently, the two companies formed a joint venture to run maintenance operations and improve efficiency at six Stora Enso plants in Finland. The joint venture is based on ABB’s Full Service concept for improving the performance and reliability of production assets. It is the largest agreement of its kind in the pulp and paper industry.

Verenium and VPP Sign Agreement to Test C5 Cellulosic Technology on Pulping Feedstocks for the Production of Ethanol

Cambridge, MA (4 November 2009)—Verenium Corporation (Nasdaq: VRNM), a pioneer in the development of next-generation cellulosic ethanol and high-performance specialty enzymes, today announced that it has entered into an agreement with Value Prior to Pulping (VPP), an organization created by the Agenda 2020 Technology Alliance, a special project of the American Forest and Paper Association, and CleanTech Partners, Inc., to test the effectiveness of Verenium’s C5 technology for the creation of cellulosic ethanol from the hemicelluloses generated by the pulp and paper process, creating higher value products without negatively impacting paper quality. VPP is funded by the U.S. Department of Energy (DOE), the State of Wisconsin and several large forest products companies.

“We are pleased to be partnering with VPP and enthusiastic for the opportunity to explore the potential of our C5 technology to create biofuels from feedstocks sourced from the pulping process,” said Gregory Powers, executive vice president of research and development of Verenium. “Integrating ethanol production into the pulping process could create an attractive market opportunity for Verenium and the pulping industry. If this project proves successful, Verenium will be well positioned to enable this new source of low-cost biofuels.”

It is estimated that a typical 1500 ton-per-day kraft mill could produce approximately 15 million gallons of ethanol annually. The total potential market opportunity is estimated to be between 1.5 and 2 billion gallons of ethanol per year. “We believe these types of opportunities to ‘bolt’ our technology onto existing industrial processes, where the feedstock sourcing, handling and processing are already well-established, and are complementary to our core biofuels strategy,” said Carlos A. Riva, president and chief executive officer of Verenium.

About Verenium

Verenium Corporation is a leader in the development and commercialization of cellulosic ethanol, an environmentally-friendly and renewable transportation fuel, as well as high-performance specialty enzymes for applications within the biofuels, industrial, and animal health markets. The Company possesses integrated, end-to-end capabilities and cutting-edge technology in pretreatment, novel enzyme development, fermentation and project development for next-generation biofuels. Through Vercipia, a 50-50 joint venture with BP, the Company is moving rapidly to commercialize cellulosic technology for the production of ethanol from a wide array of non-food feedstocks, including dedicated energy crops, agricultural waste, and wood products. In addition to the vast potential for biofuels, a multitude of large-scale industrial opportunities exist for the Company for products derived from the production of low-cost, biomass-derived sugars. Verenium’s Specialty Enzyme business harnesses the power of enzymes to create a broad range of specialty products to meet high-value commercial needs. Verenium’s world class R&D organization is renowned for its capabilities in the rapid screening, identification, and expression of enzymes-proteins that act as the catalysts of biochemical reactions. For more information on Verenium, visit www.verenium.com.

Forward Looking Statements

Statements in this press release that are not strictly historical are “forward-looking” and involve a high degree of risk and uncertainty. These include, but are not limited to, statements related to
the Company's operations, capabilities, commercialization activities, target markets, cellulosic ethanol facilities, target markets and future financial performance, results and objectives, all of which are prospective. Such statements are only predictions, and actual events or results may differ materially from those projected in such forward-looking statements.

Factors that could cause or contribute to the differences include, but are not limited to, risks associated with Verenium's technologies, risks associated with the costs, labor requirements and labor availability associated with Verenium's demonstration plant, risks associated with Verenium's ability to obtain additional capital to support its planned operations and financial obligations, risks associated with Verenium's dependence on patents and proprietary rights, risks associated with Verenium's protection and enforcement of its patents and proprietary rights, technological, regulatory, competitive and other risks related to development, production, and commercialization of cellulosic ethanol and other biofuels and the commercial prospects of those industries, Verenium's dependence on existing collaboration, manufacturing, and/or license agreements, and its ability to achieve milestones under existing and future collaboration agreements, the ability of Verenium and its partners to commercialize its technologies and products (including by obtaining any required regulatory approvals) using Verenium's technologies and timing for launching any commercial products and projects, the ability of Verenium and its collaborators to market and sell any products that it or they commercialize, the development or availability of competitive products or technologies, the future ability of Verenium to enter into and/or maintain collaboration and joint venture agreements and licenses, changes in the U.S. or global energy markets and laws and regulations applicable to them, and risks and other uncertainties more fully described in the Company's filings with the Securities and Exchange Commission, including, but not limited to, the Company's annual report on Form 10-K for the year ended 31 December 2008 and any updates contained in its subsequently filed quarterly reports on Form 10-Q. These forward-looking statements speak only as of the date hereof, and the Company expressly disclaims any intent or obligation to update these forward-looking statements.

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Minerals Technologies Inc. to Expand Satellite PCC Facility at Paper Mill Owned by Companhia Suzano Papel é Celulose, S.A., in Brazil

NEW YORK, NY (22 October 2000) - Minerals Technologies Inc. (NYSE: MTX) announced today that it will expand its satellite precipitated calcium carbonate (PCC) plant at a paper mill owned by Suzano Papel é Celulose, S.A. in Suzano, Brazil. The facility, which was originally constructed in 1996, is operated by Minerals Technologies do Brasil Comercia e Industria de Minerais Ltda. The satellite PCC plant that produces filler material for Suzano's uncoated freesheet paper, will increase from a two-unit facility to three units, with a unit equivalent to 25,000 to 35,000 tons of PCC produced annually. Minerals Technologies also provides PCC to Suzano Papel é Celulose, S.A. from its satellite plant at the papermaker's mill at Mucuri, Brazil.

“We are very pleased to be able to expand our operations and our long-term relationship with this world-class paper company,” said Joseph C. Muscari, chairman and chief executive officer, adding that the expansion will be in operation in the first quarter of 2010. PCC is a specialty pigment for filling and coating high-quality paper. By substituting PCC for more expensive wood fiber, customers like Suzano are able to produce brighter, higher quality paper at lower cost. Minerals Technologies originated the satellite concept for making and delivering PCC on-site at paper mills, and the company helped to enable the Brazilian industry to compete in the global paper market while optimizing the consumption of critical natural forestry resources. Minerals Technologies constructed its first PCC satellite plant in 1986. Today, the company has 53 satellite plants in operation or under construction around the world and continues to lead the industry with consistent quality and technical innovation. Minerals Technologies Inc. is a global resource- and technology-based growth company that develops, produces and markets worldwide a broad range of specialty mineral, mineral-based and synthetic mineral products and related systems and services. The company recorded sales of $1.1 billion in 2008. For further information about Minerals Technologies Inc., look on the internet at http://www.mineralstech.com/

UPM Chapelle Darblay’s River Transport System for Recovered Paper Awarded

UPM, Helsinki (4 November 2009) - UPM Chapelle paper mill’s innovative river transportation system for recovered paper in France has been honoured with two environmental accolades. The cities of Ile-de-France (Paris area) honoured the transport system with a special prize of the Environmental Awards. Also, the Initiatives of the Economy granted the innovative logistics system with a trophy in the category “Sustainable river transportation”.

UPM’s innovative river transport system between Paris and Rouen decreases the CO2 emissions while it increases the group’s transportation capacity. Every week, a barge carries finished paper products to the printers of the Paris area and returns back to the Chapelle Darblay mill with recovered paper. The transportation system offsets 4,500 trucks from the A13 motorway annually. The Environmental Awards of the cities of Ile-de-France (Paris area) are granted to particularly innovating initiatives done in partnership with communities. The Initiatives of the Economy aim at highlighting initiatives implemented to stimulate economic development. The jury was composed of 70 journalists from the economic press.

“We are proud to gain recognition for our excellent environmental performance in this project, achieving 40% less CO2 emissions”, declares André Poiré, logistic project manager of UPM. “This was only possible thanks to our long-term partnership with the Syctom de l’Agglomération parisienne, the local recovered paper collector of the Paris area, as well as the support of both Port de Paris (Paris Harbour) and Voies Navigables de France (navigable rivers of France). “The new system is central to UPM's environmental approach. It encompasses sustainable forest management, preservation of natural resources and biodiversity, development of renewable biofuels and the efficiency of energy consumption. The Group also works hard to streamline its logistic solutions to minimise the impact of transportation.

The UPM Chapelle Darblay mill in Rouen produces 100 % recycled newsprint from recovered newspapers and magazines. In addition, a biomass-based boiler produces bioenergy used by the mill.
National Engineers Week 2010

14-20 February 2010
As a supporter of the National Engineers Week Foundation and its activities, ISA encourages you to join the mission of celebrating, sustaining, and growing the engineering profession for years to come. We invite you to participate in National Engineers Week 2010, 14-20 February.

The week features many educational activities in which you can take part to enlighten the hearts and minds of students and younger generations during this annual event.

National Engineers Week (EWEK), founded in 1951 by the National Society of Professional Engineers (NSPE), is a formal coalition of more than 70 engineering, educational, and cultural societies and more than 50 corporations and government agencies. This coalition is dedicated to raising public awareness of engineers’ positive contributions to quality of life.

EWEK promotes recognition among parents, teachers, and students of the importance of a technical education and a high level of math, science, and technology literacy; and motivates youth to pursue engineering careers in order to provide a diverse and well-educated future engineering workforce.

Each year, EWEK reaches thousands of schools, businesses, and community groups across the United States. These community outreach programs and K-12 DiscoverE classroom visits depend on grassroots organizations and local volunteers like ISA Members for success.

How can you be a part of National Engineers Week? Check out the events and activities that need your help by visiting [http://www.eweek.org/EngineersWeek/EngineersWeek.aspx](http://www.eweek.org/EngineersWeek/EngineersWeek.aspx)

Click on the “Get Involved” tab and you’ll find 50 ways to participate as a volunteer.

Membership Extension for Unemployed ISA Members Continues into 2010

To support loyal ISA Members during these difficult economic times, ISA is once again granting an extension of membership benefits to unemployed Members. This extension was created in 2009 and has been renewed for 2010. It will last for a period of up to 12 months from membership renewal date. During the extension, all Member benefits will continue, including Division memberships, except that delivery of InTech and any Division newsletters will be in digital form.

This program is available to Members entering active grace status on or after 1 January 2010 and who apply for the extension. Any Member, other than Student Members, may request this extension.

**How to Apply for Membership Extension**
ISA Members who become unemployed may contact ISA by e-mail (info@isa.org) or phone (+1-919-549-8411) to request a one-time, one-year extension of the current membership term. These Members need to advise ISA within the first three months of their renewal period.

**Your Job Search**
Membership extension is one component of a larger effort on the part of ISA to assist Members who have become unemployed. Other components include:
- [http://www.isa.org/ISAJobs](http://www.isa.org/ISAJobs)
- [www.automationtechies.com](http://www.automationtechies.com)
- [www.automation.com/career-job-center](http://www.automation.com/career-job-center)

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Photo by: F.T. Eyre, National Building Museum
MANAGING ASSETS WITH MODERN TOOLS
AT WHITE BIRCH PAPER

Eric Tremblay¹, Michel Ruel²
1- White Birch Paper, Quebec City, Quebec, Canada
2- Top Control Inc., Quebec City, Quebec, Canada, and Green Bay, WI, USA

Keywords: Process Control, Optimization, Oscillation, Performance, Key Performance Index, Proactive Maintenance, Performance Monitoring, Asset Management, Failure Detection, Alarm Management, Condition-Based Maintenance

ABSTRACT

To remain competitive in today’s global market, it is crucial to use information efficiently and effectively. Most plants have a lot of data. By using modern tools such as alarm management, control performance monitoring, and process optimization, it is now possible to convert this data into results and diagnostics. Energy costs are rising, markets are increasingly competitive, and managers must ensure that all resources are affected where they are the most needed so that they generate added value. All assets – especially process control equipments – must be maintained in an optimal state so that they provide the best performances. To reach these objectives, managers should use modern tools and make sure that their teams benefit from performance measurements and diagnostics.

Also, it is essential to sustain results and performance improvements. Performance can decline for various reasons:

- Operation procedures change;
- Raw material quality varies;
- Equipments wear out;
- Maintenance is done;
- Processes change;
- Costs increase;
- Personnel rotate.

Asset management and performance improvement are not new: traditional methods can be used, but modern tools with computers and software must be privileged. In fact, the key is in the approach: it is
important to ensure that constant efforts are made. The performance of process control systems will decline if they are not optimized regularly. In most plants, the performance of improvement projects will decrease by 50% per six months.

In the past, White Birch Paper tried to use performance monitoring, but with limited success. Recently, the project manager decided to deploy tools in one sector to mobilize employees and to obtain good results. Since energy represents the main cost at this plant, the steam plant was selected. Three concurrent tools were used:

1. Alarm management using software and consultant expertise
2. Control performance monitoring using software and consultant expertise
3. Process optimization, including the use of advanced control strategies to manage fuels

Alarm management consists of producing an alarm management model that improves operational performance while meeting regulatory and safety standards. Effective alarm systems create effective operators, but ineffective alarm systems pose serious risks to safety, environment, and plant profitability.

Control performance monitoring consists of analyzing incoming signals (process variables, transmitter signals, measurements, generated set points, and states) and outgoing signals (controller outputs and set points) in order to determine whether the expected performance is reached. All signals are read from the control system (distributed control system, programmable logic controller, quality control system, etc.) via digital communications. The system detects oscillations, equipments that do not behave as benchmarked, process control problems, process problems, operation problems, etc.

Process optimization consists of reducing energy costs, managing fuel usage, and improving operations.

The project was done in three one-month phases. The consultant and plant personnel worked together and their collaboration was successful.

1. INTRODUCTION

As many industries, the pulp and paper industry capitalizes on economic variables and benefits from a favorable market cycle. In the recent years, the situation of the pulp and paper market has been difficult and competition has been pushing plants to their limit.

To remain competitive, managers try to leverage human and strategic resources. They adopt “best practices” and set performance incentives, while complying with security, health, and environmental norms. In that context, information is a critical resource: if it is used and managed properly, it can become a strong competitive advantage. Yet, although information is accessible, companies often lack resources and processes to exploit it at its full potential.

This paper shows how White Birch Paper adopted an approach to make a better use of their available data. To improve profitability and operations, they established a modern
and efficient structure for information management.

2. WHITE BIRCH PAPER

Headquartered in Greenwich, Connecticut, White Birch Paper is a privately owned, family-run business that manufactures and ships paper products to customers in North America and all over the world. White Birch Paper operates four pulp and paper mills: three in Canada and one in the United States. Together, these mills produce more than 1.3 million tons of newsprint and directory paper, with up to 50 percent of recycled content.

Purchased by White Birch Paper in 2004, the Stadacona mill is located in Quebec City, Quebec, Canada. This mill uses recycled fiber content in all its products, at levels that meet or exceed current or proposed government requirements. Recently, the Stadacona mill benefited from numerous investments: a thermo-mechanical pulp mill and a highly-efficient, state-of-the-art de-inking facility were acquired, and the “wet end forming section” for paperboard manufacture was modernized. Table 1 summarizes the Stadacona mill’s activities and assets.

<table>
<thead>
<tr>
<th>Products:</th>
<th>Newsprint paper</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Directory paper</td>
</tr>
<tr>
<td></td>
<td>Recycled paperboard</td>
</tr>
<tr>
<td>Annual capacity:</td>
<td>Newsprint: 410,000 metrics</td>
</tr>
<tr>
<td></td>
<td>Directory: 95,000 metrics</td>
</tr>
<tr>
<td></td>
<td>Paperboard: 45,000 metrics</td>
</tr>
<tr>
<td>Paper machines:</td>
<td>Newsprint: 3</td>
</tr>
<tr>
<td></td>
<td>Directory: 1</td>
</tr>
<tr>
<td></td>
<td>Paperboard: 1</td>
</tr>
<tr>
<td>Other:</td>
<td>Recycling plant</td>
</tr>
</tbody>
</table>

Table 1. The Stadacona Mill’s Activities and Assets

3. SELECTION OF TOOLS AND CONSULTANTS

White Birch Paper has developed rigorous approaches to choose its tools and consultants. In the past, tools have been installed with limited success: the connectivity was problematic and the databases were duplicated. Recently, White Birch Paper decided to adopt a structured approach to use the data that was already available in their PI historian. They selected three tools to improve their performance and operations:

1. Alarm management
2. Control performance monitoring
3. Process optimization and tuning of control loops and control strategies

The criteria they used to select the tools and consultant include:

1. Uniform environment
2. Web-based reports and data presentation
3. Common server installation
4. Use of archived data
5. Proven tools, references, good support, widely used in industry
6. Experts in process control
7. Experts in coaching and training management and plant floor personnel

OBJECTIVES

The objective of alarm management was to implement a system collecting all alarms and events coming to the operators. The system generates web-based, standards-compliant (EEMUA 191 and ISA SP 18.02) KPI reports that give an accurate snapshot of the current state of alarm management in the plant.

The objective of control performance monitoring was to implement a supervision
system that (1) detects, with pertinent indicators, any performance deviation of loops or sectors (according to the pre-set reference), and (2) proposes actions to correct deviations. The system must detect all problems related to control loops, process equipments, operations, and production. It must also handle special control strategies (cascade, feedforward, override, ratio, etc.) and generate predefined reports.

The objective of process optimization was to implement tools to tune multiple PID loops simultaneously through non-disruptive closed-loop testing, in minutes. The system keeps a record of all tests and decisions. It must be powerful but simple enough to be used by technicians.

**STEPS**

The project was organized in five steps:
1. Validate connectivity and data quality
2. Install tools in a specific area: the steam plant
3. Gradually imply personnel to create interest
4. Optimize steam generation, boiler operations, and control strategies
5. Develop KPI’s and quantify results

**SCOPE**

Alarm management was implemented at the steam plant only. The control performance monitoring system was installed on 1,000 loops, in seven areas. The process optimization tool was installed on the server and on a laptop computer. Figure 1 shows the network structure.

**Figure 1. Network Structure**

4. **EXECUTION**

The system set-up was executed in less than two weeks. After, performance indexes and the system structure were adapted and refined in successive steps, in collaboration with various plant departments. The complete process was supervised by Top Control.

A work team is set up since January 2008. It includes engineers, technicians, and operators from different plant departments, and two specialists from Top Control. They make sure that the tools meet the objectives. Most efforts were focused on the steam plant. However, when problems occurred in other areas, the tools were used to solve them.

**FOLLOW-UP AND COACHING**

A reliability director supervised all the steps and weekly meetings were organized to do close follow-up.

**PARTNERSHIP**

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Presented at ISA Expo 2008; [http://www.isa.org](http://www.isa.org)
White Birch Paper and Top Control have a partnership relationship; they meet on a regular basis.

5. EXAMPLES

ALARM MANAGEMENT

Alarm management was the first tool used. Bad actors were identified and problems were fixed. Alarm management was also used to debottleneck the process, pinpoint nuisance alarms, review critical alarms, and modify alarm priorities.

The alarm reports obtained for two months, before and after alarm rationalization, are shown in Figure 2.

Table 2 compares alarm statistics for the two months. It can be noted that alarm rationalization allowed to reduce the total number of alarms by 59%.

<table>
<thead>
<tr>
<th></th>
<th>February 2008</th>
<th>June 2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>24 269</td>
<td>9978</td>
</tr>
<tr>
<td>Worst day</td>
<td>2974</td>
<td>1399</td>
</tr>
<tr>
<td>Average</td>
<td>35</td>
<td>13</td>
</tr>
</tbody>
</table>

Table 2. Comparison of Alarm Statistics for February 2008 and June 2008

Figure 3 shows a common alarm performance indicator (API), before and after alarm rationalization. Each symbol corresponds to one day. It can be noted that alarm rationalization allowed to reduce considerably the number of hours during which the operator is flooded by alarms.

CONTROL PERFORMANCE MONITORING
Control performance monitoring was used to identify oscillatory loops, loops that were not performing well, and control strategies that needed to be reviewed.

Figure 4 shows control performance reports for two months, before and after control performance monitoring. The reports include service factors (i.e., percentage of time during which the loop is in the right mode). Three areas have been optimized: they are identified with red rectangles. It can be noted that Chaudière7’s service factor increased from 65% to 85% thanks to control performance monitoring.

The treemap visualization tool is useful to identify which areas and loops are performing, at a glance. The treemap tool can display all loops (at this plant, there are 863 loops) or loops in a specific area. Also, it is possible to apply filters to view only certain loops or areas. Figure 5 shows treemaps for the steam plant (101 loops) divided in areas, for two months. The size of each box depends on performance (speed of response) and the color depends on the service factor. When this project began, many boxes in the treemap were yellow (warning) or red (benchmark violation). The top left area corresponds to the first line in Figure 4 (biomass boiler).
PROCESS OPTIMIZATION

The process optimization tool was used to tune control loops, cascade systems, and more complex control strategies. This tool was used by technicians and engineers during normal operations. TaiJi PID software generated a small excitation on set points and the response was analyzed to modelize the process, and to tune loops and control strategies.

Figure 5. Treemaps for November 2007 and April 2008

For example, the most important loop (Pressure plant master PIC1900) has been tuned successfully. In the past, employees tried to tune this loop with other tools, but too many disturbances occurred during the

Figure 6. Plant Master Performance

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Presented at ISA Expo 2008; http://www.isa.org
tests. The loop is now performing well in all conditions. The results are shown in Figure 6. It can be noted that process optimization allowed to eliminate oscillations and improve settling time, which is now 15 minutes.

6. SUSTAINING PERFORMANCE

PERFORMANCE DECLINE

In any plant, performance continuously declines, for various reasons:
- Operation procedures vary
- Quality of raw materials varies
- Equipments wear out
- Maintenance modifies equipments
- Configuration changes are made
- Processes are modified
- Costs increase
- Etc.

Using a performance monitoring software can allow to sustain performance (as shown in Figure 7). When a threshold is reached, an alert is sent.

Figure 7. Performance Decline

SMALL GESTURES THAT COUNT

Over time, employees’ interest declines, support decreases, and regularity becomes erratic (as shown in Figure 8).

Figure 8. Interest, Support, and Regularity Decline

To avoid this situation, it is essential to establish a workflow with daily, weekly, and monthly procedures. Also, a champion should take the lead of the project. Gains should be quantified, communicated, and explained, and employees should be encouraged to build on successes.

Figure 9 shows the cost reduction obtained over a six-month period for steam production. For confidentiality reasons, x has no units; the real cost has been multiplied by an unknown factor.
Figure 9. Cost Reduction

The results are better than expected: the costs were reduced by 50% even if combustible costs increased during that period. The return on investment is excellent: it is less than three months.

7. CONCLUSION

The purpose of this article was to show the benefits of using modern tools to improve plant performance. Adding value to actual data results in a considerable competitive advantage. Using the reports, managers and operation personnel can manage the resources more efficiently.

Today, the approach described in this article is used in other areas of the mill. The tools have been deployed to benchmark each area. Thanks to employees’ commitment, management’s involvement, White Birch’s rigorous approach, and Top Control’s expertise, the project was a success.

REFERENCES

INTRODUCTION

In pulp and paper manufacturing, numerous functional gases are used for pulp bleaching, liquor oxidation, pulp or water acidification, ink flotation and effluent treatment. However, air above all, can seriously impair pumping, washing and papermaking operations when it is not added on purpose.

At FPInnovations’ Paprican Division, we have been working on a simpler and cheaper way for real-time measurement of entrained or injected gas in various types of streams. The system we have moved towards is based on measuring the pressure difference between two points, which gave us the opportunity to design portability and ruggedness into our instrumentation. Also, we were able to use pressure-based technology because we found that the problems of density variations that arise in other industrial applications do not arise to any significant degree in pulp and papermaking streams. The launch of the Air Content Control System was the outcome of our efforts. It was developed in conjunction with Process Measurement & Controls, Inc., Danbury, Connecticut (www.Pmc1.com), and full details of the system can be found at http://www.pmc1.com/Capability.asp?CapabilityID=1028&Cat1ID=80.

In brief, the FPInnovations(Paprican Division)-PMC Air Content Control System provides a real-time measurement of entrained or injected gas content in a pre-determined zone of an aqueous suspension. The dispersed air probe is comprised of a plurality of flush-mounted pressure sensors in direct contact with process liquid. The PMC sensors are typically fixed laterally on one or several pipes that are firmly held in place on a plate or in flanges that are mounted on the top or on the side of a tank, vessel or flotation cell. The change in pressure between at least two accurately determined positions provides a precise measurement of dispersed gas content between the two pressure readings. The
probe provides accurate and repeatable gas contents in various pulp and papermaking streams, in process waters and in effluents. Up to eight probes can be mounted temporarily or permanently in both non-agitated and agitated vessels, over a broad range of temperatures, in corrosive and abrasive media. It can be easily made portable for monitoring and troubleshooting air content in various site locations.

In the development stage of the technology, the dispersed gas monitoring system was brought to several kraft and recycling mills in order to identify the positive or negative role of gas content on numerous unit operations. It became clear that acceptance of the Air Content Control System by mill technicians depended on it performing a useful control function. Adoption of the system was seen as well justified to the extent it helped improve the effectiveness of cleaning operations such as de-inking, resolve a costly operational problem and/or reduce chemical usage and waste. The opportunity to cut chemical costs was viewed as an especially attractive benefit.

In the following section, I describe just one example of the successful application of our Air Content Control System. Other important examples are described in more detail elsewhere [see references 1 and 2 at the end of the article].

**EXAMPLE OF APPLICATION**

*Air Content in a Flotation Rejects Tank*

*Effect on a microwave consistency signal*

It is notorious that air content in pulp stocks affects the reading of most flow and consistency meters. Though various measurement principles (e.g., optical, shear force, microwave, etc…) are used to measure pulp stock consistency or total solids, air content affects the reading of each transmitter type to different extents. It was shown that between 0% and 1.4% air content in pulp stocks, air sensitivity for three types of transmitters using diverse sensing principles increased in this order: shear force, optical, microwave [3]. The authors concluded that with a microwave transmitter in particular, air content monitoring was an important factor for proper control of pulp consistency. This assertion was verified in a recycling plant, where the signal of a microwave pulp consistency transmitter played a key role in the monitoring and control of flotation rejects. In this mill, secondary flotation rejects flowing from a foam tank eventually feeds a press. The suspension in the tank, which carries a considerable amount of air from secondary flotation cells, consists primarily of filler and fines with a relatively small amount of long fibres, ink and stickies. This heterogeneous mixture of solids is well suited for a microwave sensor application though the variable amount of air in the suspension has caused concerns about the reliability of the consistency transmitter and hence the control strategy. To avoid excessive amounts of entrained air into the tank, a defoamer was usually metered in, but there was no effective means to assess the optimum dosage required because the air content was generally unknown. To assess the effect of air content on the reading of a microwave consistency transmitter, the air content probe was mounted in the bottom of the rejects tank, at a position near the microwave
consistency sensor. The air content and total solids readings were recorded simultaneously in the Distributed Control System (DCS), while foam tank samples were occasionally taken for total consistency measurements in the laboratory. During the testing period, total solids concentrations varied between 2.7% and 4.4%, whereas, air content in the suspension fluctuated over a broad range of 1.5% to 14.7%.

As shown in Figure 1, total consistencies estimated by the microwave transmitter were rarely in agreement with the actual consistencies. Indeed, microwave transmitter readings were often too low, rarely equal and sometimes much too high, especially for suspensions of high consistencies and air contents. With very variable air contents in the floated rejects feeding this tank, the calibration of the microwave consistency transmitter could not provide an accurate consistency reading unless air could be eliminated, maintained in a narrow range or measured continuously in order to correct the consistency signal. Figure 1 shows that when the microwave consistency and air content signals were included in a multiple linear regression model, agreement between predicted and measured consistencies was very good, with a relative error of less than 3%.

![Figure 1. Microwave transmitter consistency reading, without and with a correction for air content, versus actual](image)

\[
y = 2.7014x - 5.3613 \\
R^2 = 0.8544
\]

\[
y = 0.9971x \\
R^2 = 0.9714
\]

**Defoamer control**

Defoamer is widely used in the pulp and paper industry to control the air content and the degree of foaming in liquor and whitewater streams. Because the air content is rarely monitored on-line in mills, there is a general tendency to overdose defoamer, which is not only a costly practice but also a potential cause of deposition. To test the
applicability of the air probe for automatically controlling the defoamer feed rate in the same flotation rejects tank described above, defoamer additions were changed in a stepwise fashion. As shown in Figure 2, the air content signal responded well to step changes in defoamer dosage. At the normal defoamer charge, corresponding to 50 mL/min, air content in the foam tank was about 4%. Upon the reduction of defoamer dosage, air content rose to 7.5%, which led to an erroneous estimate of the consistency by the microwave transmitter. With on-line monitoring of air content, it became clear that defoamer dosage could be adjusted automatically to any pre-set air content in the rejects.

Figure 2. Step changes in defoamer dosage and their impact on the air content in the foam tank collecting the secondary flotation rejects.

To automatically control the defoamer dosage, changes in air content with time, $\varepsilon(s)$, shown in Figure 2 were analysed by a first order kinetic model of the form:

$$
\varepsilon(s) = \frac{g}{\tau + 1} e^{-Ds}
$$

(1)

In equation (1) $s$, $g$, $\tau$ and $D$ represent the time, the gain of the controller, the time constant of the tank and the time delay between defoamer addition and the response of the air probe. For this tank, the model showed that the gain was -0.09 %/mL, the time constant was 9 min, with a delay of 5 min. A good fit of the data to the model is shown in the upper part of Figure 3, where the response (air content) was normalized according to
the mean value. The bottom graph presents the step change with the time of the normalized defoamer dosage. By using this model, it became a simple matter to automatically control the defoamer dosage to a preset air content, at which the material could be pumped and the consistency properly determined by the microwave consistency sensor.

The concurrent monitoring of consistency and air signal has eventually allowed correcting the consistency signal over a broad range of air contents in the foam tank, while minimizing defoamer use. Indeed, data collection at the mill on tank behaviour at different air contents has eventually led to the elimination of a defoamer. Savings in defoamer have resulted in a six weeks payback for the probe. Finally, the probe was not only used to correct the consistency measurement, but also to compensate the flow measurement, and develop on-line measurement of the cell mass rejects rate.

Figure 3. Fit of the air content data to the kinetic model of the foam tank (Eq.1).

CONCLUSIONS
A simple example was used to demonstrate the usefulness of an on-line gas content monitoring system based on accurate pressure reading between two points of a suspension. It should be pointed out that the system can be used in any aqueous stream that is not subject to important variations in density. Most pulp, papermaking and effluent streams have a stable density of one and are therefore perfectly suited for this technology.

REFERENCES

