Director’s Message
By Brad S. Carlberg, P.E.
BSC Engineering – Daphne, AL

Well, I’m just recovering from the long hours spent all last week at the 2002 Presidents Fall Meeting and the ISA 2002 Fall Conference & Exhibition in Chicago. I even got to spend an hour or so seeing the exhibits after the pulp & paper technical sessions got done, what a break.

I’d like to thank all twenty speakers and session developers (you know who you are – and if you don’t know who they are you can see AND hear their presentations by going to the PUPID websites). Despite a disappointing attendance (on Wednesday morning I heard that there were only 14,000) we DID have quality IF NOT quantity.

As for the Presidents Fall Meeting and, in particularly the Council of Society Delegates meeting, (can anybody spell “frugal”?) all of the agenda items that were voted on passed EXCEPT for the $10 new members processing fee; The Life Member qualification was increased five years to 25 years ISA membership and age plus membership must equal 90; dues were raised to $85 per year; the temporary reduction, from 20% to 17%, in the ISA rebate to sections also passed; the “virtual” Student Member status passed; and reduced membership for developing countries was passed. I suggest paying your 3-year dues BEFORE January 1 before they go up! (Even though dues may cost you a bit more, I promise to give you MUCH more than the other divisions in the form of free papers on the website, more technical content in the newsletter, and audio-visual presentations on the websites! You’ll have to accept the poor quality recordings this year since, even by attempting to plan months in advance, I wasn’t allowed access to the conference room sound system without paying a prohibitively-high fee; but next year I will have a wireless microphone. (I had thrown out that idea as too pricy, but was wrong!)

Out of the ten PUPID sessions, three of the four tutorials were published (only sixteen tutorials were published for the entire conference) and eight of the eleven papers were published in the conference proceedings; and PUPID invited the final keynote speaker, Chris Bannon, from the Biosphere 2 in Arizona. According to the ISA Conference & Exhibit committee, for the conference as a whole, there were 115 papers, 65 tutorials, 19 panels, and ONE poster session. You can see the fourteen pulp & paper presentations AND listen to what the speakers said by going to the PUPID website. The eight papers that were published in the conference proceedings are also there for you to read.

The other good news for PUPID is that the PUPID Scholarship Endowment has now been set up to perpetuate the yearly awards to students. You can go to the website to download the application. Spread the word to those deserving students!

We are in the middle of the planning for the Spring 2003 Symposium for which we will again partner with TAPPI; this time with the TAPPI Papermaking, Coating, Finishing, Microbiology, Process Control, Electrical & Information, Process & Product Quality and Engineering divisions at the Sheraton Chicago Hotel & Towers next May 11-15. We currently only have two sessions, but will hopefully get up to equal the four sessions we had at last spring’s TAPPI Paper Summit in Atlanta.

At the ISA Joint A&T/I&S Luncheon, I was proud to accept for PUPID the ISA Most Improved Division and Runner-up for the Communications Award. The Power Industry Division won both awards; you better look out next year!

Well, I’ll sign off now until next year; keep watching the PUPID website for upcoming attractions!
Tuning Tip

By Michel Ruel, P.Eng.

Improper update time is the most common problem with PIDs in PLCs. To ensure that PID is done at an exact point in time, an interrupt file is sometimes used. Due to programming error, often the interrupt file can be called more than required and causes the PID integral action to be excessive. The PID can be tuned by trial and error but the integral value achieved makes no sense. A simple way to monitor the file execution is to put an auto reset contact in the file and a counter to monitor the contact’s transition outside the file. If the counter counts up to more than expected, than the interrupt is serviced at a faster rate than required.

You can reach Michel at
mrue@topcontrol.com

Or read the latest TopControl Newsletter at
http://www.topcontrol.com

We’ve still need a ISA PUPID Newsletter

Editor

Join the PUPID Executive Board!
It ain’t that difficult!
We’ll give you a Microsoft Word template
& all you need to do is fill it up!

ISA Standards Committees Listserver at:
http://www.isa.org/shell/cgi/lyris.pl?site=isa&page=topic&topic=standards+committees&text_mode=0&lang=english

ISO Standards Technical Committee List

Calendar of Events

Get a quick overview of the ISA PUPID events for 2002 by going to the Calendar at:
http://www.isa.org/~pupid/2002_PUPID_Calendar.htm
OR
http://www.isa.org/~pupid/ISA_PUPID_2003_Calendar.htm

May 5-7, 2003
57th APPITA Annual Conference
Themes include: Managing Technology, Controlling Wastepaper
Contamination and Quality, Coating and Printing, Water and Energy
Conservation, and Systemised Troubleshooting
Carlton Crest Hotel, Melbourne, Australia

May 4-7, 2003
International Environmental Conference & Exhibit
With TAPPI, NCASI, PAPTAC, USDA Forest Service
Oregon Convention Center, Portland, OR

PIMA 2003
Vancouver, BC
April 27 - 30, 2003

2003 ISA PUPID Spring Symposium at the 2003 TAPPI Spring
Technical Conference & Trade Fair with PCEI, Paper & Board and
Coating divisions
Sheraton Hotel & Towers, Chicago, IL
Come & See the PUPID sessions!
May 11 - 15, 2003

ISA President’s Fall Meeting
Reliant Park, Houston, TX
October 18 - 19, 2003
Come meet your leaders & get involved!

ISA 2003
October 20 - 23, 2003
Reliant Park, Houston, TX

Upcoming ISA Conferences & Exhibitions

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
<th>Date</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td></td>
<td>October 21 – 24</td>
<td>Chicago, Illinois</td>
</tr>
<tr>
<td>2003</td>
<td></td>
<td>October 20 – 23</td>
<td>Houston, Texas</td>
</tr>
<tr>
<td>2004</td>
<td></td>
<td>September 20 – 23</td>
<td>Houston, Texas</td>
</tr>
<tr>
<td>2005</td>
<td></td>
<td>October</td>
<td>Chicago, Illinois</td>
</tr>
<tr>
<td>2006</td>
<td></td>
<td>October 9 – 12</td>
<td>Houston, Texas</td>
</tr>
<tr>
<td>2007</td>
<td></td>
<td>October 20 – 23</td>
<td>Chicago, Illinois</td>
</tr>
<tr>
<td>2008</td>
<td></td>
<td>October 20 – 23</td>
<td>Houston, Texas</td>
</tr>
<tr>
<td>2009</td>
<td></td>
<td>October 11 – 14</td>
<td>New Orleans, Louisiana</td>
</tr>
</tbody>
</table>
You can see the online calendar at [http://www.isa.org/~pupid/ISA_PUPID_2003_Calendar.htm](http://www.isa.org/~pupid/ISA_PUPID_2003_Calendar.htm)
### SEE AND HEAR THE PULP & PAPER INDUSTRY DIVISION PRESENTATIONS

<table>
<thead>
<tr>
<th>Room N428C</th>
<th>Speakers Breakfast — Authors/Presenters &amp; Session Developers meet each morning to finalize session details</th>
</tr>
</thead>
</table>
| Room S404D Monday Session 1 (9:30am-11:00am) | Session Number: ISA02-P047  
Session Type: Tutorial  
Session Title: “Learn how to Assess and Improve Control Loop Performance”  
PROCEEDINGS PAPER  
AUDIO  
Developer: Hank Brittain — TOP Control |
| Room S404D Monday Session 3 (1:45pm-3:15pm) | Session Number: ISA02-P035  
Session Title: “The Powerhouse”  
Developer: G. Kevin Totherow – InSource Software Solutions |
| Room S404D Monday Session 4 (3:30pm-5:00pm) | Session Number: ISA02-P013  
Session Type: Tutorial  
Session Title: “Papermaking Retention Aid Control”  
PROCEEDINGS PAPER  
AUDIO  
Developer: Michael H. Waller |
| Room S404D Tuesday Session 1 (9:30am-11:00am) | Session Number: ISA02-P036  
Session Type: Panel  
Session Title: “Web-Based HMI’s”  
Audio: Marcos Taccolini – InduSoft  
Osvando Barsiv – OSIsoft  
NOT ON PANEL  
Scott Woolridge - Ci Technologies, Inc.  
NOT ON PANEL  
Anders P. Martinsson – ABB  
NOT ON PANEL  
Audio: Christopher J. Stearns – Honey Industrial Control  
Audio: G. Kevin Totherow – InSource Software Solutions |
| Room S404D Tuesday Session 4 (3:30pm-5:00pm) | Session Number: ISA02-P047  
Session Type: Roundtable  
Session Title: “Instrument Person’s Roundtable”  
Developer: Steve Moon – DES, LLC |
| Room S404D Wednesday Session 1 (9:30am-11:00am) | Session Number: ISA02-P042  
Session Type: Papermaking  
Session Title: “Consistency Meter Sampling & Calibration”  
Audio: Tom E. McCloskey, P.E. - Temco Engineering |
| Room S404D Wednesday Session 4 (3:30pm-5:00pm) | Session Number: ISA02-P158  
Session Type: Panel  
Session Title: “Web-Based HMI: Putting Technology Into Action”  
 ISA02-P139 – John Johnson - EnteGreat – “MES Isn’t Dead - It’s Alive & Well & Adding Value In Pulp & Paper & Converting Operations”  
 ISA02-P158 Keith A. Jones – Prism Systems – “Regulatory Reporting Made Easy”  
 PROCEEDINGS PAPER  
 AUDIO  
 Developer: Don J. Jenkinson – MEMECO SALES & SERVICE CORPORATION  
John Chapman’s PROCEEDINGS PAPER  
 ISA02-P158 Keith A. Jones – Prism Systems – “Regulatory Reporting Made Easy”  
 PROCEEDINGS PAPER  
 AUDIO  
 Developer: Don J. Jenkinson – MEMECO SALES & SERVICE CORPORATION |
### Welcome To New PUPID Members

#### 2002 New PUPID Members for October

<table>
<thead>
<tr>
<th>Name</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ian P. Drazin</td>
<td>Mark Coppler</td>
</tr>
<tr>
<td>Gilberto R. Chapa</td>
<td>Gordon R. Waye</td>
</tr>
<tr>
<td>Stephen Zitin</td>
<td>Dr. Edward Ratnam, PhD</td>
</tr>
<tr>
<td>Richard H. Krause</td>
<td>Faheem S. Pradhan</td>
</tr>
<tr>
<td>Paul Darche</td>
<td>Mihir Gangoly</td>
</tr>
<tr>
<td>John D. Roushey</td>
<td>Robert James Marvin</td>
</tr>
<tr>
<td>Joseph H. Walker</td>
<td>Allan W. Head</td>
</tr>
<tr>
<td>W. C. Morrison</td>
<td>David C. Rijoas</td>
</tr>
<tr>
<td>William L. Robinson</td>
<td>Mark R. Fernald, II</td>
</tr>
<tr>
<td>Rick Meeker, Jr., PE</td>
<td>Igor Alvarado</td>
</tr>
<tr>
<td>Darrell Howard Hargett</td>
<td>Glyn Phillip Hill</td>
</tr>
</tbody>
</table>

#### 2002 New PUPID Members for November

<table>
<thead>
<tr>
<th>Name</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. Thomas Grubb</td>
<td>Clark Minter, III</td>
</tr>
<tr>
<td>Jon G. Parker</td>
<td>James C. Long, III</td>
</tr>
<tr>
<td>Scott A. Davis</td>
<td>Kemal Y. Joomun</td>
</tr>
<tr>
<td>Robert L. Inglin</td>
<td>Jaret Kyle McCoy</td>
</tr>
<tr>
<td>Don Whitehouse</td>
<td>Garrett Morgan Nagy</td>
</tr>
<tr>
<td>John P. Sullivan</td>
<td>Trae Rushing</td>
</tr>
<tr>
<td>John W. Mitchell, PE</td>
<td>Larry Meagher</td>
</tr>
<tr>
<td>Gary A. Karnowski</td>
<td>Christopher David Barclay</td>
</tr>
<tr>
<td>Brian Thomas Mizner</td>
<td>Ms. Shyamala Shanmugavel</td>
</tr>
<tr>
<td>Ramakrishna Raghavendra</td>
<td>Paul J. Caragher</td>
</tr>
<tr>
<td>Raju</td>
<td></td>
</tr>
<tr>
<td>Ken Lea</td>
<td></td>
</tr>
<tr>
<td>Darrell A. Dawson</td>
<td></td>
</tr>
<tr>
<td>Gerald P. J. Desrochers</td>
<td></td>
</tr>
<tr>
<td>Virgil E. Sutton</td>
<td></td>
</tr>
<tr>
<td>Brendan C. McGlynn</td>
<td></td>
</tr>
<tr>
<td>W. H. Nilsson, Jr.</td>
<td></td>
</tr>
<tr>
<td>John E. O'Dell</td>
<td></td>
</tr>
<tr>
<td>Jerome R. Wenzel</td>
<td></td>
</tr>
</tbody>
</table>

**Come On Back!**

If any of you know any of these folks, urge them to renew their PUPID memberships.

<table>
<thead>
<tr>
<th>Name</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amit Pratap Singh</td>
<td>Yogesh Kishor Rao Pathak</td>
</tr>
<tr>
<td>John Murray</td>
<td>Claude Malaga</td>
</tr>
<tr>
<td>J. Paul Darche</td>
<td>Stewart S. Laing</td>
</tr>
<tr>
<td>Vinod Dattatrey Jadhav</td>
<td>Kishor Kishan Rao Joshi</td>
</tr>
<tr>
<td>William A. Smart</td>
<td>John Little</td>
</tr>
<tr>
<td>Bob Brophy</td>
<td>Travis W. McNeal</td>
</tr>
<tr>
<td>Michael F. Folk</td>
<td>Ray Reimert</td>
</tr>
<tr>
<td>Karl T. Kelley</td>
<td>Vishal Dileep Gosavi</td>
</tr>
<tr>
<td>Brian R. Watson</td>
<td>David J. Van Bergen</td>
</tr>
<tr>
<td>Mike A. Senechal</td>
<td>Dennis Cahill</td>
</tr>
<tr>
<td>Sandip Mohan Waghmare</td>
<td>Thomas W. Burdi</td>
</tr>
<tr>
<td>Jim Johnson</td>
<td>Rick Guliuzza</td>
</tr>
<tr>
<td>Shrikant Anilrao Kurundkar</td>
<td>Keith Sleater</td>
</tr>
<tr>
<td>Nitin Sudam Shevate</td>
<td>Bruce Allen Smith</td>
</tr>
<tr>
<td>D. Wayne Phillips, PE</td>
<td>Michael W. Smith</td>
</tr>
<tr>
<td>Timothy D. Locke</td>
<td>Jeff Linzmeier</td>
</tr>
<tr>
<td>Raghvendra Shivajrao Lavekar</td>
<td>C. Curt Davis</td>
</tr>
<tr>
<td>Randy P. Adams</td>
<td>Bill Hamby</td>
</tr>
<tr>
<td>John David Crowe</td>
<td>Jeffrey L. Roushey</td>
</tr>
<tr>
<td>Lou Heuchert</td>
<td>Charles L. Vivien, Jr.</td>
</tr>
<tr>
<td>Earl E. Otto</td>
<td>Stephen M. Nichol</td>
</tr>
</tbody>
</table>

---

**Come On Back!**

If any of you know any of these folks, urge them to renew their PUPID memberships.

<table>
<thead>
<tr>
<th>Name</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Michael Bischak</td>
<td>Mark S. Gimson</td>
</tr>
<tr>
<td>Kenneth Wayne Furra</td>
<td>Volker Schulz</td>
</tr>
<tr>
<td>Eduardo Guerra</td>
<td>Georg E. Mueller</td>
</tr>
<tr>
<td>Michael P. McKuen</td>
<td>Stephen Prout</td>
</tr>
<tr>
<td>Ronald M. Townsender</td>
<td>John P. Colby</td>
</tr>
<tr>
<td>Vanamali Ramaswami</td>
<td>Jim T. Noon</td>
</tr>
<tr>
<td>Robert Fuller</td>
<td>James A. Aldredge</td>
</tr>
<tr>
<td>Robert F. Sikora</td>
<td>Gary Moore</td>
</tr>
<tr>
<td>Vincent P. Hagan</td>
<td>John E. Lajoie</td>
</tr>
<tr>
<td>John E. O'Dell</td>
<td>Alper Aytekin</td>
</tr>
<tr>
<td>Mrs. Dara Reed</td>
<td>James C. Batchelor, Jr.</td>
</tr>
<tr>
<td>Nitin S. Bhatt</td>
<td>Philip C. Milliman</td>
</tr>
</tbody>
</table>
Emerson Receives $5.3 Million Project To Automate New Pulp Mill in Chile

Oct 22, 2002 - Business Wire
Author(s): Business Editors And High-Tech Writers

ST. LOUIS--(BUSINESS WIRE)--Oct. 22, 2002--

Celulosa Arauco S.A. will utilize Emerson's PlantWeb(R) architecture in the largest-ever FOUNDATION(tm) fieldbus installation in the Pulp & Paper industry.

Contracts worth $5.3 million (US) have been awarded by Celulosa Arauco y Constitucion S.A. to Emerson Process Management, an Emerson business (NYSE:EMR), for process automation systems, equipment and engineering services for what will be one of the world's largest pulp mills.

Arauco, based in Santiago, Chile, is one of the world's largest forestry companies in terms of plantation size, lumber processing and production of market kraft pulp.

Already under construction near the city of Valdivia, Chile, the new mill will use a state-of-the-art process control network with Emerson's PlantWeb(R) digital plant architecture. The PlantWeb architecture will include more than 3,500 FOUNDATION(tm) fieldbus instruments and the DeltaV(tm) control system, making it the largest such installation of the fieldbus technology in the pulp and paper industry. Project design and execution services will be provided by Emerson.

Located 100 miles south of Santiago, the new mill will produce between 550,000 and 600,000 tons of bleached softwood and hardwood market pulp per year from pine and eucalyptus logs beginning in late 2004. Excess electricity generated at the mill will be sold to the Chilean national power grid. Arauco expects the entire project to cost $1.2 billion (US). A similar pulp mill to be built near Itata, Chile, is in the planning stages.

Arauco currently operates four pulp mills in Chile, with a combined capacity of 1.5 million metric tons per year, as well as seven sawmills. In addition, the company owns and manages 595,000 hectares of Chilean timberlands.

The selection of Emerson followed an extensive search to choose the best, proven new technology that would serve Arauco's requirements today and in the future, along with the project execution services needed to ensure a successful, on-time and on-budget project. Design requirements for the new mill included:

-- Low investment cost without sacrificing quality
-- Use of proven process technology and equipment
-- Efficient consumption of wood, energy and water
-- Low air and water emissions in agreement with the environmental permit.

Emerson's predictive maintenance software will be used to communicate with the field instruments installed in the mill to help insure high plant reliability and availability, and performance. Emerson is also expected to provide up to 21,000 hours of engineering services for installation, configuration and startup of the process automation system.

"The leading-edge PlantWeb digital plant architecture will make positive contributions to meeting all of Arauco's key design parameters," said John Berra, executive vice president of Emerson with responsibility for the process management business. "As the largest application of the PlantWeb technology in the pulp and paper industry to date, this project is a very significant example of the worldwide acceptance of PlantWeb digital plant architecture. It will serve as a benchmark for future investments in automation by this and other industries."

About Emerson Process Management

Emerson Process Management (www.emersonprocess.com), an Emerson business, is a leader in helping businesses automate their production, process and distribution in the pulp & paper, chemical, oil and gas, power, food and beverage, pharmaceutical, semiconductor and other industries. The company combines superior products and technology with industry-specific engineering, consulting, and project management, and maintenance services. Its brands include: PlantWeb(R); DeltaV(R); Fisher(R); Micro Motion(R); Rosemount(R); Performance Solutions; and AMS.

About Emerson

St. Louis-based Emerson (www.gotoemerson.com) is a global leader in bringing technology and engineering together to provide innovative solutions to customers in process control; electronics and telecommunications; industrial automation; heating, ventilating and air conditioning; and appliances and tools. Sales in fiscal 2001 were $15.5 billion.

PlantWeb, Fisher, Micro Motion, Rosemount, DeltaV and FIELDVUE are marks of Emerson Process Management. FOUNDATION is a mark of the Fieldbus Foundation. Other marks are the property of their respective owners.
Invensys Recognized for Outstanding Performance on Major Fiberline Expansion Project in Brazil

Sep 12, 2002 - Business Wire  
Author(s): Business Editors

FOXBORO, Mass.--(BUSINESS WIRE)--Sept. 12, 2002--

Aracruz Celulose, The World's Largest and Most Modern Pulp Mill,

Names Invensys a “Pro-Active Partner”

Aracruz Celulose, the world's leading producer of bleached eucalyptus pulp, has named Invensys Systems Brazil as a Pro-Active Partner for the Invensys unit's outstanding performance on the very successful startup of the 780,000 metric tons per year Fiberline C project at the Espirito Santo mill in Brazil.

As the principal automation vendor on this world-class expansion project, Invensys provided Foxboro intelligent field instrumentation; I/A Series control systems and associated services; plus Advanced Process Control solutions for pulp mill optimization. This includes two advanced control applications utilizing Connoisseur MPC (model predictive control). Invensys also provided Esscor FSIM simulation to emulate the I/A Series system.

Invensys coordinated closely with several process equipment Engineering Procurement Contractors, project consultants, and the end-user in order to provide the required automation scope.

"We're very honored to have been named as a Pro-Active Partner by Aracruz Celulose," said Ricardo Pereira, General Manager of Invensys Brazil. "Our relationship with Aracruz extends back more than a quarter of century and we're pleased to be able to continue to provide Aracruz with the latest I/A Series automation systems and other advanced Invensys technology solutions."

Aracruz selected the I/A Series system for the Fiberline C expansion project based on the system's open and flexible architecture, well-proven reliability, digital field integration capabilities, and ease of configuration. The I/A Series system is utilized in all major units at Aracruz Celulose to help improve operating performance and reduce costs. InTouch HMI software from Wonderware, another Invensys unit, is also used in the woodyard.

ABOUT ARACRUZ CELULOSE

Aracruz Celulose is the world's largest producer of bleached eucalyptus pulp, sold worldwide to manufacturers of tissue, printing, writing, and specialty papers. With the completion of the Fiberline C expansion project, Aracruz has the capacity to produce 2,000,000 metric tons a year of pulp from planted eucalyptus forests. It exports 97% of its production and is one of the largest generators of net foreign exchange for Brazil. In 2001, it had 4,831 direct employees and it is estimated that it generates about 50,000 indirect jobs.

For more information on Invensys, please visit www.invensys.com.

Invensys, I/A Series, Foxboro. Connoisseur, Simulation Sciences, Esscor, InTouch and Wonderware are trademarks of Invensys plc, its subsidiaries, or affiliates. All other trademarks are trademarks of their respective owners.
Matrikon's ProcessDoctor Online improves plant reliability, performance and profitability

Apr 10, 2002 - Canada Newswire

Online condition-based maintenance improves plant operating margins, resulting in millions of dollars annually for process manufacturers.

EDMONTON, April 10 /CNW/ -

HIGHLIGHTS

- Typical process manufacturing plants have hundreds of control loops and not enough manpower to determine which loops are not performing at optimal levels.

- Poor control loop performance contributes to such problems as poor product quality, poor production rates, emissions violations and high equipment maintenance costs.

- ProcessDoctor helps by identifying the 'bad actors' that negatively impact plant operating margins.

USER BENEFITS

- Instant value: from installation to configuration and reporting, clients can identify the most problematic control loops in a matter of hours. Identifying and adjusting these control loops often delivers return on investment in a matter of weeks.

- Continuous improvement: continually prioritize and schedule control loop adjustments.

- Sustained value: through continuous online monitoring and scheduled analysis, control loops can be maintained at optimal performance.

Matrikon Inc. (TSE: MTK) today announced the release of ProcessDoctor Online v3, a condition-based monitoring product that improves plant profitability by detecting and diagnosing poor plant performance. ProcessDoctor Online uses advanced analysis, leading research and web delivery of information to provide a complete solution to clients in the utilities, oil and gas, chemicals, pulp and paper and mineral processing industries.

A typical industrial plant has hundreds of control loops that function to maintain system performance close to desired specifications. Poor control loop performance is a leading cause of production problems, resulting in inconsistent or poor quality product, increased energy and raw material consumption, low production rates and damage to equipment. Up to 50% of the control loops in modern plants can be improved. With so many loops, it is difficult to identify and prioritize loop maintenance. The result is that the maintenance performed is reactive rather than proactive.

ProcessDoctor Online addresses this issue with by automatically collecting relevant plant data and analyzing it to ensure...
optimal performance is maintained. Flexible reporting via web and email ensure that timely, accurate information is distributed to the appropriate personnel when loop deterioration is detected.

"Process companies are severely challenged to enhance their 'Return on Assets'," according to Dave Woll, VP Consulting for the ARC Advisory Group. "ProcessDoctor Online attacks this issue by enhancing asset effectiveness. Because it is platform independent it can further enhance productivity as a consistent solution across all of a company's legacy and new control platforms."

"ProcessDoctor Online is all about getting the right information to the right person at the right time," stated Warren Mitchell, product director. "We've worked closely with our customers and incorporated many of their suggestions in the latest version. Their continuous feedback taught us that how a product fits the business and work processes in an organization is as important as the technology itself."

Amin Rawji, executive vice president of Matrikon stated: "ProcessDoctor Online represents the realization of the vision we had when we started developing the first version of the product - to be able to monitor control loops and quickly figure out which ones are causing the most grief for almost instant return on investment."

About ProcessDoctor

ProcessDoctor is an online control loop performance diagnosis and monitoring product that uses advanced statistical methods to pinpoint problem areas and suggest corrective action. Product features include:

- Connectivity to all commercial historians and distributed control (DCS) systems
- Automated data collection, cleaning, analysis and reporting
- Web or email delivered reporting
- Easy to use configuration and reporting templates allow users to rapidly configure and deploy the system
- Supports analysis and monitoring of advanced regulatory controllers
- Drag and drop user interface
- Troubleshooting and diagnostic tools identify what to fix
- Measures and tracks performance improvements
- Continuous analysis to ensure performance improvements are sustained
- MATLAB(TM) and Generic Code objects allow users to build and configure custom monitoring algorithms.
- 6 SIGMA catalog allows users to monitor key production and quality variables online
- From install to up and running in a matter of hours

A sampling of results achieved with ProcessDoctor:
- 40% reduction in variability in satgas and platformer units -
world-scale refinery, Middle East
- 7% increase in naphtha recovery - oil sands extraction facility,
Northern Alberta
- 30% reduction in overall process variability - pulp and paper facility,
Alberta

For more information: www.matrikon.com/processdoc

About Matrikon Inc.

Matrikon is a leading supplier of industrial IT solutions specializing in web-based products and optimization solutions that deliver agility to the manufacturing industries through increased operating efficiency and profitability. Matrikon is headquartered in Edmonton, Alberta with offices throughout North America.

Matrikon's client base includes industry leaders in a wide range of manufacturing industries and includes approximately 50% of Fortune 500 companies in these target industries.

nicole.sayler(at)matrikon.com; To request a free copy of this organization's annual report, please go to http://www.newswire.ca and click on reports(at)cnw./

(MTK.) ST: AlbertaSU:

Pulp and paper mills regulated

Jul 1, 2002 - Area Development Site & Facility Planning
Author(s): Anonymous

THE U.S. Court of Appeals for the District of Columbia Circuit recently affirmed updated Clean Water Act discharge limitations for pulp and paper mills. The new regulations will substantially reduce discharges of numerous toxic pollutants, and will encourage mills to use the most modern and effective pollution-control technologies.

Pulp and paper mills traditionally have used large amounts of bleaching chemicals, such as chlorine, as part of the production process, potentially leading to increased discharges of pollutants, including dioxin. To meet the new standards, existing mills will no longer be able to use the most harmful types of chlorine in the bleaching process, and new mills will need to implement process changes that will bring about additional pollution reductions.

To encourage even more pollution controls, the U.S. Environmental Protection Agency (EPA) has adopted the Voluntary Advanced Technologies Incentive Program.
**OPTIMUM EO STAGE PRESSURE**

**by Wayne Bucher WB Consulting, Inc**  
wbucher@charter.net

What is the optimum target pressure for an extraction (E) stage in the pulp bleaching operation? Since most mills have now operate their E stage as a combination EOP stage, the benefit of each chemical and its appropriate best operating conditions should be evaluated. Pressure is necessary for the oxygen gas (O) to be effective along with the caustic (NaOH). Some mills have learned that by raising this pressure, more work can be done in this stage, and consequently, less is required elsewhere for a given brightness. In some cases, less hydrogen peroxide (P) is needed when the pressure is raised. Raising the pressure will allow chemical savings by using oxygen, which is significantly less expensive than either hydrogen peroxide or chlorine dioxide.

So what is an appropriate design pressure for an E stage? Apparently there are two schools of thought on this subject. One can be called conventional, that 25 psi at the top of a 10 minute reactor is optimum. No argument that this is better than a simple extraction stage or EO stage with only 3-5 minutes in an atmospheric up-flow tube. To contrast with this, however, several mills are now operating with 50+ psi (some with 90 and 100 psi) at the top of the 20-30 minute tube.

For the conventional sequence, diminishing returns set in above this 25 psi at the top of the up-flow. Some may be bounded or limited by their historical experiences with chlorine, or an inability to reach 175-180º F (required) in the EO pressurized stage. For example, if a mill made the switch to ECF bleaching but kept basically the same targets for second stage kappa and brightness, there may be very little available delignification work left that can be done with oxygen, regardless of what pressure is used. Likewise, if the maximum temperature achievable is only 160ºF due to limitations in steam supply or inadequate mixing prior to the tower feed pump, little benefit will be seen from varying the pressure. Also, there is less benefit of raising the pressure if an oxygen delignification system precedes the bleach plant, which also limits their need to push the EO stage.

![Effects of Pressure on EO Stage](image)

A practical consideration is reaching the lower limit, i.e. a “floor” of about 2.0-2.5 kappa after the E stage washer (softwood). The “floor” can be reached by using different combinations of chemicals (cooking, O₂ delig., D1 and E stages). Many mills are also adding hydrogen peroxide (H₂O₂, for an Eop stage). Most people that are using a lot of peroxide do it because they can’t make enough ClO₂ or to brighten the effluent color due to regulatory requirements of their receiving stream. For delignification, oxygen is the least expensive chemical, however, it has diminishing performance as the kappa number drops. ClO₂ is more selective than oxygen, but is also quite a bit more expensive. Some mills charge as low as 0.08 kappa factor in the first D stage and have little or even no peroxide charge in the E stage. Not only does this reduce the cost for bleaching chemicals, it lowers the AOX generated, which is a concern for some mills due to effluent restrictions.

If there is work that can be done with oxygen, then raising the pressure will help the oxygen be more effective. This is an issue of physics, related to bubble size given a fixed amount of mixing. According to the ideal gas law, PV=RT, raising the pressure will keep the oxygen gas bubbles small and available for the localized chemical reactions after it has been mixed. As the pressure is reduced, the bubbles grow in size and will coalesce as they bump into each other. These larger bubbles have much less mass and will burp up through the pulp without being available for the desired bleaching reaction. Raising the pressure minimizes this inefficiency.

Several mills are now doing more work with oxygen in the E stage. The economic return is the result of reducing the work done with H₂O₂ or in the prior ClO₂ stage. The required changes, while being mill specific, are generally inexpensive relative to the economic return possible.

The pump must be able to supply the pressure required at typically above 10% consistency. A good high shear mixer is required to adequately mix the oxygen gas. (Realize that mixers are not all equal, especially for mixing gas!) Proper attention should be paid to the pipe run after the mixer and before the tower, as shear forces in the piping can defeat the benefit of mixing when large volumes of gas are present. The pressurized up-flow tower must be able to withstand the maximum pressure of the pump in a head-dead condition, otherwise, a pressure relief system must be in place. And more time may be needed for significantly more reaction to occur. But even with only 10 minutes in an upflow tube, more pressure will help the performance. In some installations, the change may require only the pump to be modified (motor, impeller) to take advantage of a higher operating pressure. Mills that already have a variable speed drive on the MC pump and a pressurized up-flow tube have very little cost required to begin evaluating the operating cost savings.

As a word of caution, be aware of the behavior of the medium consistency pump. Some pumps develop more pressure with lower consistency pulp. Regardless of the pump characteristic, lower consistency pulp has significantly less head loss per foot of pipe run. Therefore lowering the consistency can temporary increase the pressure into the upflow reactor or tower. Be sure that an upset in operating conditions will not result in an over-pressurized up-flow tube. Even if controls can be tuned to quickly restrict the pump discharge valve, the proper fail safe design should not include a situation where short term spikes in pressure will overly stress the vessel.

With the ability to raise the pressure, the bleach plant operation can be optimized to lower the cost of bleaching. See the attached graph for relative performances, (2% NaOH, 20 minutes, 85 and 95 ºC, 25-100 PSI at end of reaction time)³.

1. Gord Homer, Air Liquide America supplied a nomograph used to estimate delignification.
The Aracruz A recovery boiler - A successful upgrade in record time

Kvaerner Pulping and Aracruz Celulose have successfully completed one of the world’s most extensive recovery boiler upgrades.

**Effectivity** - From contract signing to start-up of liquor firing in November 2001 took only 15 months. Kvaerner mobilized its engineering resources and boiler shops to accomplish all engineering and manufacturing in only 12 months.

Dismantling, construction and commissioning of the boiler in a little more than 3 months was another great challenge for Kvaerner, which required careful planning.

**Leadership** - 3 440 t ds per day is the new capacity of the boiler which was originally delivered in 1978 for a load of 1 800 t ds per day. The Aracruz A upgrade confirms once again Kvaerner’s leadership in the supply of large recovery boilers.

Aracruz says: “We would like to congratulate Kvaerner Pulping and their subcontractors Irmãos Passaúra who, through careful planning, have been able to complete the boiler while attaining very good technical performance, including safety.

**Extensive scope of supply** - The upgrade went much further than a conventional project. It included all the pressure parts and a number of auxiliary systems.

The original boiler was a bi-drum boiler from Götaaverken Energy. The design load was 1 800 t ds per day at 60% dry solids content. The upgraded boiler is designed for 3 440 t ds per day at 77% dry solids content.

**Upgrade facts** - The upgrade is based on replacement of the existing pressure vessel with a new optimised one, including the following parts:

- New enlarged composite furnace
- New downcomers and additional risers
- New water screen
- New boiler bank and steam drum
- Five new superheater banks
- New steam attemperation

In addition to the new pressure vessel, the upgrade also includes the following auxiliary equipment:

- New feed water pump
- Multi-level air system
- New dissolving tank
- Additional sootblowers
- Twelve new liquor burners
- Eight new start burners
- CNCG combustion system
- Additional ESP chamber
- Kvaerner ash leaching system
- BLRBO advanced control system
- Simulator training
CONSISTENCY CONTROL AUDIT  
BY BILL BIALKOWSKI BIALKOWSKI@ENTECHCONTROL.COM

From the March 2002 & November, 2002 EnTech Report’s

This audit example shows consistency control on a paper machine. Fig 1 shows a simplified P&ID. Fig 2 shows the variability before and after tuning with the top graphs showing Machine Chest consistency and bottom showing Blend Chest consistency before and after tuning of the Blend Chest consistency loop for a Lambda of 50 seconds. Note that the machine chest consistency is measured only and not controlled. Note also that the Blend Chest dilution valve is closed for part of the run from second 1000 to 1800 before tuning while it stays open after tuning.

Q1: By how much did the variability improve as a result of retuning and what impact might this have on PM basis weight variability?

A1: The blend chest consistency variability was reduced from 0.846% down to 0.304%, a reduction of 64% and as a result the machine chest variability was reduced from 0.928% to 0.541%, a reduction of 47%. This should virtually eliminate thick stock as a significant variability source for basis weight depending on what the basis weight variability started at (typically over 1%). The lowest basis weight EVI recorded to date is 0.64%

Q2: Does the existing control (NC-101) violate the new EnTech Consistency Control Loop Dynamic Specification in any way based on the data presented?

A2: NC-101 violates the consistency specification because the blend chest dilution valve is reported to be closed for 800 seconds in Figure 2. The consistency specification is very clear on the need to always have the dilution valve in control range.
PERRY -- Colored like cola, stinking of rotten cabbage and holding virtually no life, the water in Florida's most polluted river flows slowly to the Gulf of Mexico.

A meandering 20 miles from the Buckeye Florida pulp mill that pollutes it, the tree-shrouded Fenholloway River looks as rugged and natural as any of North Florida's healthy rivers. Yet even where it meets the coast, the Fenholloway still stinks as bad as the point the mill discharges its 46 million gallons of polluted wastewater into the spring-fed river every day.

The resulting wastewater, though treated extensively at the plant, causes high salinity, unnatural coloring and extremely low oxygen levels in the Fenholloway, leaving virtually no room for life in the river or at its delta.

The river has been tainted since 1954, the year Proctor and Gamble opened its massive plant in Perry, about 50 miles southeast of Tallahassee. Residents of the region know better than to swim or fish in the Fenholloway, and most would never drink any of their well water due to contamination.

The mill chose Perry for a specific reason -- the state gave the mill a river to use and abuse. In 1947, the state designated the Fenholloway as Florida's only Class 5, or "industrial river," meaning the state acknowledged the river's only suitable human use would be as a dumping ground for industrial waste.

The designation was used to entice industry to this wooded, agricultural region with historically high unemployment. The Buckeye plant, which once had 1,200 workers, now employs 650 and remains by far the largest employer in the region.

State and plant officials have been working for decades to improve the quality of the mill effluent and to revive the ailing Fenholloway, which consists of 99 percent wastewater after it passes the mill.

But recommendations are expected this summer from a unique partnership: Mill technicians, state and federal regulators, a group of scientists and hard-core environmentalists have teamed up to look for ways to reduce mill pollution and save the Fenholloway.

So far, skeptical members of the partnership have acknowledged that Buckeye officials have been open about their processes and problems and have shown a willingness to improve.

"They're trying to do the right thing, and I have to give them credit," said Linda Young, a lawyer for the Florida Clean Water Network. "We're all in this together, and for once we're all making decisions that should benefit the river."

The partnership is looking at three things: how to improve in-plant processes to reduce pollution; how to improve the mill's wastewater treatment capabilities; and how to create a wetland restoration project that could provide natural filtration for the treated wastewater.

The pollution results from a process in which pine trees are cooked in water to separate out cellulose, a substance used in hundreds of products ranging from rayon clothing to diapers to casings for medicines and sausages. The plant uses 2.7 million tons of trees a year and draws about 42 million gallons of pure water a day from the Floridan aquifer.

Only a couple species of fish, mainly those oddballs with both gills and lungs like bowfish and mosquito fish, can survive in the Fenholloway below the mill. Some of the fish that do live in the river have undergone sex changes -- females have grown male sex organs -- probably due to hormones in the wastewater that alter their endocrine systems, a Texas scientist has found.

When he did his studies, University of Texas-El Paso biologist William Baldwin said the nutrients and chemicals in the Fenholloway are somehow mimicking the male hormone testosterone.

"There's something in that river and no one knows what it is," said Baldwin, who studies fish in polluted waterways, "and we don't know if it gets into the well water."

Locals know not to swim or fish in the river, which expands to roughly 60 feet in width near the coast, and people who live along it do not receive the benefits of normal riverside life. Most residents in incorporated areas have been set up with municipal water, but in this predominantly rural area many people still rely on their wells.

A few years ago, residents were told their wells are contaminated and should not be used for drinking water, said Jim McNeal, ground water section chief for the Florida Department of Environmental Protection.

"We did find contaminants [in tested well water] similar in chemistry to the effluent that was being discharged," said McNeal. "Compounds are there, but primary standards for well water are not being broken."

But Jeff Watts, a former DEP water quality scientist, said he did a study in 1989 that showed "massive groundwater contamination out there." Watts, now a municipal water analyst for Tallahassee, said his report was panned by the DEP and never moved out of the draft stage.

The state's inconsistent reports have only inflamed the fears of the people who use their well water to survive. Though health department statistics don't show a high cancer death rate in Taylor County, one longtime resident said three kids have died in recent years from brain and stomach cancers and seven women have had early hysterectomies in his neighborhood west of Perry.

"There's a tremendous amount of cancer in this area no matter what they tell you," said Joseph Cutter, 62, who gives out business cards that read "Taylor County Trouble-Maker; No Trouble is Too Small."

Cutter lives near the river and said he has fought for years to force Buckeye officials to improve their processes and the quality of their wastewater. He remains skeptical about any partnership that includes plant officials.

"You can't fight them because they have the jobs, the money and the county under their control," said Cutter, who showers in his
well water but drinks only bottled water costing $100 a month. "They say I don't know anything, but I know a rotten stinking creek when I smell one."

But the damage from the pollution in the Fen holloway isn't restricted to the river itself or the surrounding groundwater.

At its Gulf of Mexico delta, the polluted water is too dark, salty and sulfur-tinged for natural sea grass growth, wiping out a prosperous fish and wildlife breeding ground that typically occurs when fresh and salt water mix. About 17 square miles of the gulf are left virtually lifeless by Fen holloway pollution, said Robert "Skip" Livingston, a Florida State University biologist who has studied the river for 30 years.

Those sea grass marshes are critical to the entire life cycle in the gulf. Plankton live in sea grass bed, attracting small fish that then attract larger fish, birds and other sea life and mammals. The endangered manatees that typically enter fresh water rivers during the winter avoid the Fen holloway.

Buckeye officials say the plant has tried hard to improve its operations and the quality of its wastewater. The plant and its pollutants meet all wastewater standards. In fact, Buckeye has historically been an industry leader in treating its effluent and was the first pulp mill in Florida and among the first in the nation to establish an elaborate wastewater treatment system.

The plant recently stopped using elemental chlorine in its bleaching processes, instead using a less-damaging chlorine-dioxide which breaks down quicker after use, said Buckeye spokeswoman Michele Curtis.

State scientists said the Buckeye wastewater does not appear to contain any cancer-causing dioxins, though some locals and environmentalists dispute this.

The state in 1997 changed the environmental classification of the river to Class 3, which means it should be fishable and swimmable. Technically, the plant has been operating without a valid permit since 1987, which has been allowed by the state due to extensions of the expired permit.

Despite its new designation, nothing has changed and the river remains as polluted as ever. But the partnership dedicated to cleaning up the river is using the new designation as a goal.

However, Livingston said despite any clean-up efforts, the river will never return to a vibrant, pre-mill condition.

And he has another dark prediction that could put a damper on the efforts to clean up the Fen holloway. Buckeye officials said they spent $30 million over the past three years to improve the clarity of the Fen holloway to bolster sea grass growth at the delta. They say the river water clarity has improved 50 percent as a result (which allows more sunlight to penetrate the water) and they hope the grasses are coming back.

But Livingston said those efforts are creating an unanticipated side-effect. By improving the water clarity, the additional light is mixing with the nutrients and pollutants in the river to cause explosive growth of microscopic algae blooms, which can be toxic. Similar to red tide, the toxic blooms can eventually wipe out the entire ecosystem in the Fen holloway and the Gulf of Mexico.

"We're talking about serious business here, we're talking about toxins that give you cancer," Livingston said.

Livingston's dire predictions need more study but apparently may not get it. Livingston said he is upset that his research, which he said was funded by Buckeye at $190,000 a year since 1991, was being halted because the mill dropped its financial support.

After being told of Livingston's concerns, a Buckeye spokeswoman said the company has not decided yet whether to provide more funding for his research in the coming fiscal year.

The partnership studying the Fen holloway is expected to issue a report with its recommendations this summer. But observers who have spent much of their lives in Taylor County don't hold much hope for a bright future for the river.

Joy Ezell, for example, doesn't believe Buckeye officials are finally ready to rank the river over revenues.

"There's been a lot of foot dragging' going on down here," said Ezell, who once was labeled an "armed radical environmental terrorist" by the local newspaper. "I just wish people would care about this river as much as I do, though I know in my heart that may never be the case."

Staff writer Thomas Pfankuch can be reached at (850) 224-7515, extension 13 or via e-mail at tpfankuch@jacksonville.com.

HITTING HOME

The Buckeye pulp mill has proposed building a pipeline to carry its wastewater directly to the Gulf of Mexico. The Georgia Pacific paper mill in Palatka has proposed to pipe its wastewater directly to the St. Johns River, rather than using Rice Creek. Both pipeline proposals have been challenged by environmentalists.

---

**Letters To The Editor**

Send your comments on this newsletter to the ISA PUPID Technical Discussion Forum & “get something started”!

You can reach the site at [http://216.27.72.194/shellcgi/lyris.pl?enter=pupid&amp;&amp;text_mode=0&amp;lang=english](http://216.27.72.194/shellcgi/lyris.pl?enter=pupid&amp;&amp;text_mode=0&amp;lang=english) or by going to the PUPID or the main ISA websites and looking for the "ISA Technical Divisions"
“TECHNOLOGICAL ADVANCES IN PRESSURE MONITORING INSTRUMENTS”

by Ravi Jethra rjethra@sorinc.com

Pressure is defined as force acting evenly over a given area. 
Pressure = Force/Area

Pressure in a liquid is called hydrostatic pressure. The pressure is determined by the height of the liquid column and its mass density by $P=\rho gh$ where $g =$ gravitational force

The reference point of pressure is absolute zero pressure. This is the pressure of empty space in the universe. It is also referred to as absolute pressure.

The most important pressure for all life on earth is atmospheric pressure. It is the weight of the atmosphere surrounding earth

The difference between two pressures is referred to as the differential pressure.

One of the most common measurements in any process is gauge pressure. Gauge Pressure is the difference between the measured pressure and ambient or atmospheric pressure. The term pressure tends to be used if the measured pressure is greater than ambient. If it is lower than ambient, it is referred to as Vacuum.

Direct methods for Pressure Measurement include:
- Liquid Column Manometers
- U-tube manometer / Inclined tube manometer
- Piston-type devices

Indirect Methods for Pressure measurement include:
- Flexible elements : Bourdon tubes
- flat diaphragms/capsules
- Bellows
- Electrical sensors ( need external power source)
- Strain gauges, Hall effect and capacitive sensors
- potentiometric/inductive sensors.

The devices can be either: Displays/Gauges, Switches, or Transmitters.

Pressure gauges can be equipped with electrical or pneumatic accessories such as alarm contacts or analog output.

Transmitters differ from switches in that they provide continuous output ( analog 4-20 ma or pneumatic 3-15 psi). Pneumatic are almost obsolete, and have been replaced by analog or smart transmitters.

Benefits of the pressure monitoring devices in chemical processes :
- Efficient use of labor, energy and chemicals
- Immediate alarms for malfunction
- Automatic shutdown to prevent major damage
- Minimize the potential for human error.

Measuring pressure is not always as simple as it seems. In several cases, the sensing elements of a pressure instruments cannot come into direct contact with the process fluid for fear of corrosion, clogging of capillaries and product purity concerns. Such measurements can be made by using a remote seal in conjunction with a pressure instrument. A remote seal pressure instrument would include a pressure instrument, a remote seal and a capillary tube connecting the two. The capillary would be filled with a fill fluid to hydraulically transmit pressure to the sensing diaphragm.

Remote seal pressure instruments are used when : Process fluid is at an elevated temperature Process material may be a slurry that would clog standard instrument lines. Process fluid may be corrosive Process fluid may freeze or solidify during swings in ambient or process temperature. A food, beverage or pharmaceutical process may require a sanitary seal to avoid cavities and dead volume. Using remote seals would facilitate easier cleaning to avoid contamination between batches.

There are different types of remote seals (based on process connection) available such as :
- Close-Coupled,
- Flush Flange,
- Pancake style,
- Isolator –ring,
- Extended flange , etc.

The Isolator ring consists of a rubber “inner tube” captured in a steel ring. The assembly is installed between flanges in the process pipe. A fill fluid is used to transmit the pressure to the multifunction pressure sensor. The inside diameter of the ring matches the adjacent pipe so that the ring is continually cleaned by the motion of the process fluid. The isolator ring is vacuum filled with a fill fluid and permanently sealed; in other words there is no fill port. This eliminates the possibility of air compression inside the ring

Seals with a large measuring surface provide better results. The amount of error attributable to significant changes in either the process or ambient temperature varies widely with the combination of seal, capillary and fill fluid.

Technical Data and it’s definition :

Temperature errors - Every transducer not only has a sensor-specific output signal but also a temperature error that is typical for the particular sensor type.

Maximum Pressure rating : defines the maximum pressure that the transducer can be subjected to without suffering any permanent damage.

Response Time; is defined by the period of time needed by the output signal when there is a sudden change of pressure. It is usually specified within 10-90% of measuring range.

Other typical specifications include (but are not limited to): a. Process Temperature Limits b. Ambient temperature/Operating range c. Types of electrical and mechanical connections

Early 1990’s saw the global launch of Smart transmitters in a big way from all the major players. Smart transmitters were defined as microprocessor based devices with diagnostics capability and two-way communication using digital field protocols. The smart transmitters are available with different protocols such as HART, DE , Profibus and recently Foundation Fieldbus. HART remains the defacto industry communication standard, although Profibus and Foundation Fieldbus are becoming increasingly popular.
Regardless of protocols and bus capabilities, process automation is dominated by smart field devices. Two-way communications, high accuracy, increased reliability (self-diagnostics) and ease of configuration are their primary drawing cards. These intelligent devices enhance basic process control system (BPCS) applications. In fact, more features for improved asset management are being added every day, such as the Siemens Series DSIII transmitter that provides alerts for calibration and servicing of the instrument. However, smart devices can actually increase the complexity of some common applications, and, therefore, are not always the best solution.

Not all applications require the sophisticated functionality of a smart transmitter, but there are times when you need more than just a pressure switch. For certain applications, hybrid pressure instruments that bridge the gap between simple electromechanical and analog instruments and fairly complex smart instruments are probably a better alternative. Exactly what are these so called “hybrid” devices, and how do they differ from smart instruments? The newest hybrids are microprocessor-based multifunction instruments that include common features such as: local configuration, local indication of process variable direct control (discrete output) via solid state relays analog output—e.g., 4 to 20 mA self-diagnostics.

The beginning of 21st century saw the first introduction of hybrids. Hybrids should not be confused with smart multivariable transmitters such as the Rosemount Model 3095MVTM transmitter that monitors static pressure, differential pressure and temperature in a single instrument. Hybrid sensors are usually developed by manufacturers as extensions of traditional electromechanical switch and analog transmitter product lines, with an emphasis placed on niche markets and applications.

To emphasize the key benefits of hybrids, we need to ask a few questions related to field instruments. How many times have you:

- wanted to make a minor adjustment in an electromechanical switch setpoint or in an analog transmitter span, but purposely avoided it due to the need to take the device off line and manually adjust it (or even pull it out of service)?
- wanted to know the PV being measured in relationship to the electromechanical switch setpoints or spans of analog and blind smart transmitters?
- struggled with the variances in fixed deadbands and the setpoint repeatability of electromechanical switches?
- assumed that an electromechanical switch or analog transmitter is performing its intended function properly until you have tested it, and found either corroded switch contacts or an onscale analog failure? Hybrid devices overcome the above-listed limitations of analog transmitters/electromechanical switches.

The technology used allows very narrow or extremely wide deadbands and more repeatable setpoints for discrete outputs, improving the overall performance of the device and effectively reducing nuisance trips. Although the extent of diagnostics will vary, most hybrid sensors improve overall system reliability through detection of basic internal hardware and software failures. Common alarm or direct control functions can be performed without the addition of a current trip or PLC, lowering both the hardware and installation costs.

Understanding the different features associated with a hybrid pressure transmitter will help you determine their suitability for a given application.

Hybrids require power, which is usually not an issue if you are already retrofitting an analog or smart transmitter. However, some of the greater benefits of a hybrid are realized when you are upgrading from passive, electromechanical switches that provide direct control.

On the other hand, some of the benefits of the hybrid pressure instruments are:

- Most devices are 3- or 4-wire units, though 2-wire (loop-powered) configurations are available.
- Accuracy for hybrid pressure devices can range from 0.25% to 1.0%.
- Turndown capabilities can vary from nonexistent (fixed range) to 5:1.
- Most hybrids lack digital communications. Although these units are intelligent devices, they are not labeled as smart since they do not use some type of common two-way communications protocol. Some hybrids do allow you to talk to a PC for configuration, but they make use of proprietary software.
- Although they tend to respond faster than a smart transmitter, hybrids typically have slower response times to changes in the PV being measured than their electromechanical switch and analog transmitter cousins. Magnitudes can vary from 30 ms to 250 ms.

Some hybrids allow for the manual testing of outputs to ensure that SSRs and analog loops are still functioning properly, further increasing the reliability of the instrument.

The multi-function pressure instrument is basically a Switch and Transmitter (loop-powered) in a compact housing with its own display and Class I Div 2 rating for hazardous areas, which more than meets the requirements of a chemical process plant. It improves the integrity of the entire system through its self-
diagnostics and manual circuit-test capabilities. This provides additional assurance to the plant operators that the device is functioning as required. The relays can be wired directly to the local annunciator for alerting the operator to an unusual pressure condition. The local display enables the operator to quickly understand the relationship of the pressure to that of the setpoints.

An application that is well suited to the multifunction capabilities of a hybrid pressure instrument is hydrostatic level control. In the example shown in Figure, the instrument provides continuous monitoring of the fluid level, a discrete output with wide deadband for pump control, and a discrete output with narrow deadband for an overflow alarm. Adjustability of the switch setpoints over the entire operating range provides excellent local control capabilities commonly associated with the use of a PLC or DCS, and a savings of 60% in the installed costs. Other areas that have benefited from the simplicity and functionality of hybrids are:

- lubrication systems (monitoring and low alarm)
- vapor recovery systems (SOV control and monitoring) pumps (variable speed drive control, monitoring and shutdown)
- boiler water/steam generation (monitoring and high/low alarm)
- instruments for fire suppression systems
- Line Pressure monitor and alarm for carbon dioxide distribution.
- High pressure shutdown alarm on pump valve
- Output pressure monitoring for pump performance.
- Output pressure on boosters to monitor performance

Having emphasized the advantages and the functionality offered by hybrid multifunction pressure instruments; Smart transmitters are not going to lose their relevance leave alone being obsolete. This is primarily, due to the niche markets and applications addressed by hybrid devices. However, hybrids are another step in the evolution of pressure instrumentation, and its true impact will only be known over the next decade or so.

Editor’s Note: Ravi currently works for SOR,Inc (Static-O-Ring) in Kansas, USA as Product Manager. He holds a Bachelor’s Degree in Instrumentation Engineering from Bombay University (India) and an MBA from Arizona State University. Ravi has over 13 years of experience in the Industrial Automation business, and has worked in India and Middle East with automation vendors such as Rosemount and Honeywell. He is a Senior Member of ISA, and has authored several articles published in various global technical journals. His interests include visiting sites of natural beauty. He can be contacted via e-mail: rjethra@sorinc.com or fax 1-913 541 9558.

Links to Related Websites

ISA Pulp & Paper Website
http://www.isa.org/~pupid/
ISA Pulp & Paper Technical Discussion Forum
http://www.isa.org/shellcgi/lyris.pl?site=isa&topic=standards+committees&text_mode=0&lang=english
ISA 2001 Technical Conference Session Schedule
http://www.isa.org/technical_conference/TechConf.cfm?id=3
Pulp & Paper Research Institute of Canada
http://www.paprican.ca/
TAPPI
http://www.tappi.org/
PIMA
http://www.pimaweb.com/
American Forest and Paper Association
http://www.afandpa.org/
National Society of Professional Engineers
http://www.nspe.org/
Swedish Royal Institute of Technology
http://www.pmt.kth.se
Helsinki University of Technology
http://www.hut.fi/English/
Technical Association of the Australian and New Zealand Pulp &amp Paper Industry (APPIITA)
Australian Pulp & Paper Institute
ISO Standards Technical Committee List
ISA Standards Committees Listserver
http://www.isa.org/shellcgi/lyris.pl?site=isa&topic=standards+committees&text_mode=0&lang=english

Quickies

ISA Pulp & Paper Technical Discussion Forum

Anybody (not necessarily an ISA or PUPID member) can subscribe to the PUPID Pulp & Paper Technical Discussion Forum. To subscribe, go to the PUPID homepage at http://www.isa.org/~pupid/, select "Pulp & Paper Technical Discussion Forum" in the pick box, click "Go", and enter your email address and a password.

ISA Email Address for ALL Members

Any ISA member can register for a free email address and online mailbox. If you set it up, your ISA email address will be yourname@member.ISA.org. To register, go to http://www.isa.org/membership/benies/ , and follow the registration instructions.

ISA PUPID Calendar

Get a quick overview of ISA PUPID events for 2002 by going to the Calendar at: http://www.isa.org/~pupid/2002_PUPID_Calendar.htm
High quality measurements have always been an important tool in industrial automation, be it cars or paper pulp. Since the established method to guarantee high quality in industrial production is maximal automation, measurement too will be automatized. The role of the operator/engineer/technician is reduced to surveillance.

Things are changing, however. Automated processes have become much more complex; customers’ quality requirements have increased sharply. Increasing problems to uphold customer required quality have resulted in an upgrading of the operator’s role, especially regarding measurement. A modern industrial measurement policy states

“Good measurement quality” requires

- traceably calibrated measurement instrumentation
- well-educated and well-motivated personnel
- correct account of measuring methods and measurement uncertainty”

To fulfil this, an active measuring engineer or technician is required. The operator is back from the cold! How does this impact on automated paper pulp production?

The sophisticated measuring instrumentation used to steer the process (eg automated fiber quality measurement) is difficult to calibrate in a traceable way. But this is a must for high and uniform quality, especially if several plants are involved and should keep the same quality. Calibration must be done when it is needed, not in a thoughtlessly regular way. Intercalibration between the different plans is essential, and must be forced through, often against local prejudices. For these tasks, the well-motivated and well-educated engineer/technician is an essential tool.

Even if the calibration and traceability requirements are fulfilled, the instrument still can show fake values. Here the motivated and experienced operator comes in: he assesses the measured value in relation to his accumulated experience of the instrument’s behaviour. He “feels” whether the measured value is reasonable. This is called “hidden knowledge”. Every experienced operator knows how important “hidden knowledge” is in practice.

The interplay between well-functioning, traceably calibrated instrumentation and a motivated, competent operator is an essential condition for the production of paper pulp of high and uniform quality.

Uncertainty plays a central role in modern measurement. Eg: if you measure temperature, it is not the measured 105 degrees C that are relevant. It is the 105 plus minus 2 degrees C, implying that the measured value is somewhere in the interval 103 to 107 degrees C. Most probably in the interval’s mid, but it may well be near the interval’s limits, with some probability to be estimated.

The realisation that our knowledge of a measured parameter must be characterised by a parameter interval and not a parameter value has profound implications on how the control of an automated process will be handled. The operator must be aware of this – get used to thinking in parameter intervals rather than parameter values.

Classical measurement and control algorithms are not adapted to this new way of looking at measurement. Fuzzy logic, in contrast, can handle the new paradigm well. But this is a new, difficult method – automatic control based on fuzzy logic is still in its infancy to-day.

The measurement policy described above entails new ways of handling measurement.

In order to use the new principles, the operator must leave old habits behind and accept new ones. Since man is conservative by nature, this is not easy. Hence continuing education becomes an essential part of the measurement process. The operator must get used to, and trained to fulfil the new requirements.

The measurement novelties described above are introduced because they improve the quality of measurement and hence of automation. Alas, new ideas are always a disturbance of established routine, and hence unpopular. In this situation, the fact that engineers and technicians are trained to yield to logical arguments is an essential advantage: they will accept the new ideas, eventually. But it will take time!

Education teaching the new methods must be combined with discussions in order to convince the pupil/operator and make him a local apostle for the new ideas. In modern automated processes, the well-educated and well-motivated measurement man is essential.

Alexander Lauber is retired professor of Measurement technology at the Linkoping institute of technology, Sweden. He is presently assisting the Sodra Cell Company, Vaxjo, Sweden, in trying to implement the new measurement ideas at its Monstaras, Sweden, paper pulp plant.
A VIEW FROM DOWN UNDER

Ralph Coghill, outgoing APPITA President (ralph@appita.com.au), writes:

You might like to include some information on the 57th Appita Annual Conference, to be held at the Carlton Crest Hotel, Melbourne, from 5 - 7 May 2003. Call for papers deadline extended to 29 November 2002, registrations open February 2003.

The Conference will feature a comprehensive technical program (over 70 papers), operations forums, a management symposium, engineering workshop and Australasia's largest pulp and paper equipment, materials and services exhibition.

Themes for the Conference are:

- **Managing Technology** (Tuesday 6 May). The management of technology in today’s rapidly changing industry offers a major challenge to manufacturers. Who is driving technology improvement – manufacturing, suppliers or research? How is product development best managed? Papers are sought on these topics and a Management Symposium will be arranged.

- **Controlling Wastepaper Contamination and Quality** (Tuesday 6 May). The Australasian paper industry has an enviable record in utilisation of recovered fibre, with over 60% of its fibre needs being met by wastepaper. The trend towards greater use of recovered fibre continues, and this places increasing demands on quality and in particular the control and removal of contaminants. The Keynote and offered papers will consider this important area for our industry, and mill operating personnel will improve their knowledge and understanding of the challenges from the Operations Forum. Topics covered will include the implications of the Packaging Covenant on wastepaper quality, the nature of the contaminants, stock preparation and deinking processes.

- **Coating and Printing** (Wednesday 7 May). Advances in computers and printing technology have placed enormous demands on the substrate for printing. As well as quality, consumers are demanding cheaper materials, particularly in the booming domestic market. Topics covered in the papers and Operations Forum will include developments in printing paper properties, new printing technologies, coatings for better surface properties, higher-speed flexo printing for packaging.

- **Water and Energy Conservation** (Wednesday 7 May). Papers are sought on mill closure, water systems management for quality and usage reduction, alternative energy sources, practical processes to reduce greenhouse emissions and environmental performance. An Operations Forum will benefit mill personnel, who will be given practical knowledge they can apply in their workplaces.

- In addition to the three Operations Forums outlined above, a fourth Forum, **Systemised Troubleshooting** is planned to take place on Monday 5 May. It will cover topics such as process troubleshooting, automation, millwide data and control systems and creation of a ‘measurement culture’. This Forum will not be complemented with themed papers.

Tony Johnson has been elected President of Appita, the technical association serving the Australia and New Zealand pulp and paper industry. Tony is an active member of Tappi and PAPTAC and will be a great link between the organisations. He is currently Technical Manager for Beca Simons / AMEC in New Zealand. He is Chairman of the Appita Engineering Special Interest Group and is active in local Section activities.
A VIEW FROM THE MEDITERRANEAN

Jose Amable Gonzalez (joseamableg@terra.es), writes:

Buenas tardes,

Pues nada, aquí andamos y ¿qué quieres?, con la vida a cuestas, y los achaques, en fin ¡que te voy a contar! ... , and living with the .com crisis, and with some polution in Barcelona, and terrorism almost everywhere, and many people disregarding safety: yesterday in Italy's earthquake with buildings of the middle ages standing up, and new schools built without care and falling off, despite the seismic calculations that probably the architects did study in the university but either, they forgot to apply, or did not check in the field that every thing had been done as it should; and little kids death; and the authorities that should have auditted the building, sniffing out in another direction; when things like this happen, we usually say "typical Spanish", although perhaps we should say "typical of today's world".

Now, not so dramatic.

And all this introduction remembers me another fact closer to our profession which is, do you remember?, Process Measurement and Control, and that now "is owned" in many places by Digital Data Processing young and not so young people, believing that everything starts and ends with bits and bytes.

The other day somebody was saying that pneumatic technology was completely dead since the 70's, and this is bad news for one ISA Senior Life Member like me who started in our profession in 1955 and retired in 2000 and, therefore, I have been one pneumatic kid all my life, but also analog electronic and digital man; the statement about the death of pneumatics makes me feel depressed, and sad, and confused. I thought that the control valve was a part of the control loop, and that the power needed to move them, still in the 2002 era (not living in one Space Odyssey but in our rough earth) had something to deal with air under pressure (is that pneumatics?) and some kind of pneumatic relay, or perhaps some king of air solenoid valve manifold, able to increase or decrease the aforesaid pressure as the circumstances may demand. But listening the death of pneumatics mentioned by the high-tech people I imagine that now, we are in the year 2002 !!, the control valves are directly moved in one direction by just pressurized bits (or bytes?) flow, and the movement in the opposite direction for sure must be done by upside-down bits.

So ... do you see Brad what is happening in the coast of the Mediterranean, in Barcelona? some poor old people are becoming crazy due to some comments they have to hear from the super smart hard and soft young and not so young Control experts.

What about the safety issue in Internet accessible DCS's and SCADAS's?.

And finally a bit optimistic:

Fortunately we still enjoy our sun, Mediterranean food, the family life, a little humor, and through all of you the wonderful ISA Society. What else should I need?

By the way, this is my first open letter to ISA, please correct if you find some incorrect spelling.

Very best regards

José Amable
**CANADA CORNER**

The Canadian Federal Government announced in October a $246 million dollar aid packaged for laid-off sawmill workers affected by US tariffs on softwood lumber. Many BC Forest companies are posting losses in the third quarter. Difficult markets emphasize the need for optimal process controls. Every effort is focused on improved product quality, increased production and worker safety.

Brian Plamondon
brianc@celgar.com
Production Shift Superintendent
Celgar Pulp Company

**CENTRAL & SOUTH AMERICAN CORNER**

I can answer something about Fiberline C from ARACRUZ, since Jaakko Poyry was working there.

The start-up was in the last week of May. From the Digester loading until the end of Drying Machine it was only 48 hours and 1 month later it reached the full target production. They are having some variations on the process but nothing critical, and then the nominal production is varying. The record on start-up and production was related to using the process simulator for operator's training and DCS check-out, and also thanks for the EPC suppliers that worked hard on the commissioning. The Foxboro DCS and Siemens Intelligent MCC also were great.

Antonio Tomé tome.guerra@poyry.com.brajakko POYRY TECNOLOGIA LTDA


The P-2000 project was an investment that involved in the pick of the activities (Shut Down in July) more than 8.000 people. This project was a success in safety, technology, quality, people’s compromising and synergy of teams.

An strong characteristic was the form of applied administration, call “EPC”, that guaranteed an appropriate composition of packages and an optimization of the costs. They were acquired more than 1000 motors (WEG), 1600 instruments (ENDRESS HAUSER), 1200 control valves (NELES-METSO), 20 operation stations (ABB), 20 readjust (readaptar) or new process stations. The net of DCS (ABB) was completely reformulated, being considered excellent for the specialists that were in the plant. They were installed more than 20 PLC’s (SCHNEIDER ) to control intelligent MCC’s (CEGELEC / ALSTOM) and eletric systems of the plant.

Carlos Augusto Bandera
bandera@vcp.com.br
Production Shift Superintendent
Celgar Pulp Company

**FAR EAST CORNER**

Nothing from anyone there this time!

Please send me something!

**FROM THE LAND OF THE MIDNIGHT SUN**

Things are pretty gloomy for most export industries in Norway. The "land of the midnight sun" has not escaped the current problems of the global economy, although the total Norwegian finances are almost too good (due to all the oil export, and good prices). The pulp & paper industry (and all other export industries) is plagued by a very strong local currency (Norwegian Krone). If you would like some more details on the state of industry, I might get you some information from the "Paper Industry Forum".

Best regards
Geir Jåsund Managing Director Inenco AS
geir@inenco.no, http://www.inenco.no/

**Automação/Instrumentação**

bandera@vcp.com.br
2002 Pulp & Paper Industry Division Officers

Director / Webmaster:
Brad S. Carlberg, P.E.
BSC Engineering
brad.carlberg@bsc-engineering.com
(251) 621-9405
(251) 621-5139

Director-Elect:
Steve Moon, P.E.
Documentation & Eng’g Services
stevemoon@desllc.net
(205) 822-8787
(205) 822-8637

Past Division Director:
John Murray
Mead Westvaco Paper
jm9@mead.com
(740) 772-3488

Secretary / Treasurer:
vacant

Standards & Practices
vacant

Advisory Committee Chair
Larry E. Wells, P.E.
Georgia Pacific Corp.
lewells@gapac.com
(404) 652-4604
(404) 584-1466

Programs / H&A:
Marty Schweers, P.E.
Kellogg Brown and Root, Inc.
marty.schweers@halliburton.com
(251) 450-7721
(251) 450-7247

Education Co-Chairman
Michael H. Waller, P.E.
Miami (of Ohio) University
wallermh@muohio.edu
(513) 529-2205
(513) 529-3841

Education Co-Chairman
Kaichang Li
Oregon State University
kaichang.li@orst.edu
(541) 737-8421
(541) 737-3385

Paper Review Coordinator
Tommy Thompson, P.E.
Simons Engineering, Inc.
tommy.thompson@amec.com
(770) 370-3200
(770) 370-3646

Environmental Chairman
H. Pierce Rumph, P.E.
Orion CEM, Inc.
hprumph@compuserve.com
(770) 458-4535
(770) 451-1512

Advisor
Richard E. Britton, P.E.
Retired – International Paper
richardbritton1@comcast.net
(251) 342-0998
(251) 342-0998

Newsletter Editor
vacant

ISA Pulp & Paper Industry Division
P.O. Box 12277
Research Triangle Park, NC 27709

ADDRESS CORRECTION REQUESTED