Director’s Message

By Michael S (Steve) Moon, P.E.
DES LLC- Birmingham, AL

Well; it’s already the tenth day of August and the ISA Expo 2004 Conference this upcoming October 5 – 7 at the Reliant Center in Houston is fast approaching. Have you made your plans to be there? It’s going to be a good one – be there or be square!

PUPID will have sessions on all three days this year, so mark them on your calendars and plan to attend. There will be six PUPID sessions in all. The first session is. The second session is a paper session entitled “ ” with . The first session is a panel session entitled “Web-Based HMI’s (Panel) (Co-sponsored by PUPID, TELCOM, G&C, and TXD). The panelists will be. The next session is a tutorial entitled “Implementing Ethernet I/O In The Pulp Mill” by Kevin Totherow. The next session is another panel entitled “Ethernet I/O” Panel” (Co-sponsored by PUPID, COMPUTEC, G&C, and TXD). The panelists will be Benson Houglund of Opto22; Mike Larry Komarek of Phoenix Contact; Scott Saunders of Moore Industries; Don Holley formerly aith National Instruments; and Don Lupo of Acromag. At this year’s ISA Fall Conference, the ISA Joint A&T/I&S Luncheon will be on Tuesday. The PUPID Luncheon will be on Wednesday AND it will be only $10. This time it will be a “sit-down”, “hot” lunch.

The 2005 TAPPI/PUPID Spring Symposium will be in Jacksonville.

I want to remind you that the PUPID Technical Discussion Forum Lists server is still up there and waiting for your question to ask the other 600 or so subscribers. So if you have a particularly tough problem that you’ve been beating your head against, post your problem on the Lists server & you may get a good solution! It doesn’t cost you anything except a bit of time! Since the school year is about to start, remind any sophomore or junior college students to go to the PUPID website and download AND fill out the application to apply for the two $1000 scholarships we’re giving away again this year. The application’s are due by the end of February of 2005 (and that’s only six months away).

I hope to see you all at Expo 2004 in Houston this October! I hope to see you at the PUPID luncheon!

Well, I’ll sign off now until the next issue; keep watching the PUPID website for upcoming attractions!.
**ISA Standards**
PUPID needs a Standards & Practices Committee Chairman!
Get involved in an S&P Committee.

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

ISO Standards Technical Committee List
TechnicalCommitteeList

---

**Tuning Tip:**

---

### Calendar of Events

Get a quick overview of the ISA PUPID events for 2003 by going to the Calendar at: [http://www.isa.org/~pupid/2004_PUPID_Calendar.htm](http://www.isa.org/~pupid/2004_PUPID_Calendar.htm)

#### 5th PulpPaper 2004
**Sponsored by Finnish Paper Engineers, Adforum**

http://www.pulpaper2004.com

**Helsinki, Finland**

**June 1 - 3, 2004**

---

**June 14 - 17, 2004**

**2004 Control Systems Conference with PAPTAC, SPCI, & the Finnish Pulp & Paper Engineers**

**Quebec City, PQ Canada**

---

**June 27 - 30 2004**

**PIMA Leadership Conference**

**New Orleans, LA**

---

**Tissue World Americas 2004**

**September 21-23, 2004**

**Miami Beach Convention Center (MBCC)**

**Miami Beach, Florida, USA**

---

**"ISA President’s Fall Meeting**

**Reliant Park, Houston, TX**

**October 2 - 4, 2004**

Come meet your leaders & get involved!

**ISA 2003**

**Reliant Park, Houston, TX**

**October 5 - 7, 2004**

---

### Upcoming ISA Conferences & Exhibitions

<table>
<thead>
<tr>
<th>Year</th>
<th>Month</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>October 5 – 7</td>
<td>Houston, Texas</td>
</tr>
<tr>
<td>2005</td>
<td>October</td>
<td>Chicago, Illinois</td>
</tr>
<tr>
<td>2006</td>
<td>October 9 – 12</td>
<td>Houston, Texas</td>
</tr>
<tr>
<td>2007</td>
<td>October</td>
<td>Chicago, Illinois</td>
</tr>
<tr>
<td>2008</td>
<td>October 20 – 23</td>
<td>Houston, Texas</td>
</tr>
<tr>
<td>2009</td>
<td>August</td>
<td>Chicago, Illinois</td>
</tr>
<tr>
<td>2010</td>
<td>October 11 – 14</td>
<td>New Orleans, Louisiana</td>
</tr>
</tbody>
</table>
ISA PULP & PAPER INDUSTRY DIVISION 2004 CALENDAR

You can see the online calendar at http://www.isa.org/~pupid/2004_PUPID_Calender.htm
**Welcome to the 58 New ISA Pulp & Paper Industry Division Members So Far in 2004**

**Welcome to New PUPID Members**

<table>
<thead>
<tr>
<th>Tony P. Oliverio</th>
<th>John D. Pearson</th>
<th>Patrick John Doherty</th>
</tr>
</thead>
<tbody>
<tr>
<td>John F. Horn</td>
<td>William J. Lyons</td>
<td>Justin Abraham Sklaroff</td>
</tr>
<tr>
<td>Steven F. Skarda</td>
<td>Jian Qiang Xu</td>
<td>John Gregory Dearwater</td>
</tr>
<tr>
<td>Evaristo Ventura Torres</td>
<td>Timothy L. Cole</td>
<td>Oakley A. Smith, Jr.</td>
</tr>
<tr>
<td>Michael J. Elsenga</td>
<td>James M. Chernugal</td>
<td>Emerson Lee Beach</td>
</tr>
<tr>
<td>Mick Bayko</td>
<td>Ajit Bapat</td>
<td>Richard Castonguay, Jr.</td>
</tr>
<tr>
<td>Chan D. Paine</td>
<td>Abrar Khan Mohammed</td>
<td>William J. Clarke</td>
</tr>
<tr>
<td>Glenn Rose</td>
<td>Raymond Andy Cole</td>
<td>Steven Hesch</td>
</tr>
<tr>
<td>Jesse Willingham</td>
<td>Thomas E. Slusser</td>
<td>Ms. Helen Muth</td>
</tr>
<tr>
<td>Thomas J. Majerski, Jr.</td>
<td>John P. Davison</td>
<td>Walter W. Smith</td>
</tr>
<tr>
<td>Kurt Trampler</td>
<td>Francis Michael Crosby</td>
<td></td>
</tr>
</tbody>
</table>

**We’re Sorry to See 320 ISA Pulp & Paper Industry Division Members Leave in 2003**

**Come On Back!**

<table>
<thead>
<tr>
<th>William E. Butler, Jr.</th>
<th>Glen M. Untereiner</th>
<th>Raymond R. Ellison, P.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Makoto Kawai</td>
<td>Gordon Baker, Jr.</td>
<td>Glenn George Warner</td>
</tr>
<tr>
<td>Matt Cornett</td>
<td>David W. Blackwell</td>
<td>Ronald E. Bryant</td>
</tr>
<tr>
<td>Beau Jeff Ravencraft</td>
<td>Michael K. Wallace</td>
<td>Christian P. Dunlap</td>
</tr>
<tr>
<td>Ian Braff</td>
<td>Randal Schmit</td>
<td>Deric Wallace</td>
</tr>
<tr>
<td>William B. Carroll</td>
<td>Kenneth G. Duchene</td>
<td>Henry Moore</td>
</tr>
<tr>
<td>Michael R. Verner</td>
<td>Tyler Terry Stuettgen</td>
<td>James F. Shackelford, III</td>
</tr>
<tr>
<td>Timothy N. King</td>
<td>Richard Carver Porter, Jr.</td>
<td>Larry E. Buckmaster</td>
</tr>
<tr>
<td>Patrick R. Sotere</td>
<td>Charles W. Newman</td>
<td>Joseph W. Atkinson</td>
</tr>
<tr>
<td>Daniel August DeBenedetto</td>
<td>Jerry B. Goss</td>
<td>Ralph Tribble, III</td>
</tr>
<tr>
<td>Jim Crozier</td>
<td>Douglas E. Mills</td>
<td>Johnny E. Jones, PE</td>
</tr>
<tr>
<td>John D. Pigg</td>
<td>David W. Peters, PE</td>
<td>K. K. Sood</td>
</tr>
<tr>
<td>Edgardo Munoz</td>
<td>James L. Moles</td>
<td>Perry R. Graham</td>
</tr>
<tr>
<td>Robert A. Thomson</td>
<td>Philip Krikorian</td>
<td>Richard H. White</td>
</tr>
<tr>
<td>Brien F. Burke</td>
<td>Hakon Alastair Dybwad</td>
<td>Don MacKenzie</td>
</tr>
<tr>
<td>Lonn P. Moen</td>
<td>Timothy F. Murphy</td>
<td>William Haines Knox, Jr.</td>
</tr>
<tr>
<td>Dr. Henry J. Kent</td>
<td>William H. Mock</td>
<td>Scott M. Hunt</td>
</tr>
<tr>
<td>John E. Kyllo</td>
<td>John T. Kay</td>
<td>Scott R. Meister</td>
</tr>
<tr>
<td>Leigh A. Dawson</td>
<td>Stephen R. Sykes</td>
<td>Joseph R. Thompson</td>
</tr>
<tr>
<td>Ms. Rosemary A. Tobiga</td>
<td>Darrell W. Kowalyk</td>
<td>Stephen E. Helms</td>
</tr>
<tr>
<td>Alex Zack</td>
<td>William E. Buster</td>
<td>Ms. Mariana Cunningham</td>
</tr>
<tr>
<td>Mark Stirling</td>
<td>Guy Y. Barash</td>
<td>Gary Szilagyi</td>
</tr>
<tr>
<td>Robert Glenn Wollesley</td>
<td>Matti J. Hietala</td>
<td>Kevin G. Foster</td>
</tr>
<tr>
<td>Ruben Miranda</td>
<td>Harsono Salim</td>
<td>Lloyd J. Welch</td>
</tr>
<tr>
<td>Alvaro Alonso</td>
<td>Lyle Herrold</td>
<td>Cleveland M. Fair</td>
</tr>
<tr>
<td>Gasper Calandrino</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Where’s the action?
Who’s doin’ anything?
Asset Management Applications - (P) October 5, 2004, 10:00AM - 11:30AM

Application of Expert System for Total Preventive Maintenance of a Chemical Plant
Speaker(s): Babita Jain & Pradesh Andhra

Since 1990's the increased level of automation coupled with a highly competitive environment in all industries has led to heavy losses in case of equipment failure. Typically chemical plants like plastic molding units, fertilizer plants, petrochemical refineries etc suffer huge losses under such conditions. The trend initiated by the industries is to move towards total preventive maintenance, which means evolving a system, which never fails. This has lead to a shift from breakdown maintenance to preventive maintenance. Failure free operation of a plant requires planned preventive maintenance, condition monitoring, failure analysis and detection of chronic problems, proactive corrective actions, proper operating procedures and planned replacement of equipment. The present paper aims at development of an expert system for total preventive maintenance. A detailed study of a large fertilizer plant has been undertaken to identify the current existing maintenance practices, analysis of possible failures in future, evaluation of equipment against standards and condition monitoring methodology followed. Recommendations for maintenance schedules, equipment repair and replacement, improvement of equipment efficiency, calibration schedule etc is made. The work aims at creating a knowledge base to be used by maintenance personnel in the absence of an expert in the field. The knowledge base is created by accumulation of the knowledge of several widely represented experts. Thus with this accumulated knowledge base the maintenance decisions become independent of the operating personnel and depend only on the plant condition. Further the expert system also incorporates a knowledge base for diagnostics. An untrained operating personnel, detecting an abnormal operating condition (for example a leak, smoke, a blown of fuse, excessive heating of machinery etc) can seek the help of the expert system for diagnosing the fault and get recommendations for rectifying the fault. In this paper, the expert system package “EXTPM” in developing using VP expert, which has a dominant backward chaining control mechanism. The package has an effective layout, incorporates plenty of graphics and supports methods for visualization. The package developed is extremely user friendly and wide applications in small and medium sized plants are envisaged.

Asset Optimization and the SMART Refinery
Speaker(s): David Reif

Refiners are facing the true globalization of the refining business, and are focusing more and more on Operational Excellence in responding to these challenges. They are applying automation technology to construct the SMART refinery, an automation configuration rich in predictive field intelligence. One important intelligent information source is that of the critical plant assets- field instruments, valves, rotating equipment, and process equipment. Optimizing the performance and availability of the assets is key in driving the refinery to top quartile performance. This paper defines the SMART Refinery, and details the role of Asset Optimization in the SMART refinery. Included is a migration model which addresses the existing automation investment and the financial benefit opportunities for given investments.

Identifying Poor Performers While the Process is Running
Speaker(s): Michel Ruel

Michel Ruel is a registered professional engineer, university lecturer, and author of several publications and books on instrumentation and control. Michel has 26 years of plant experience, including with these companies: Monsanto Chemicals, Domtar Paper, Dow Corning and Shell Oil. He is experienced in solving unusual process control problems and he is also a pioneer in the implementation of fuzzy logic in process control. Michel is president of TOP Control Inc., a company specializing in the optimization of continuous and batch processes. Top Control offers services in optimization, troubleshooting, start-up assistance, implementation of control strategies, training and consulting.

Getting the Most out of your Control Loop - (P) October 5, 2004, 2:00PM - 3:30PM

Application of Pulse-Width-Modulation for Analog Control
Speaker(s): George Buckbee

Application of Pulse-Width-Modulation for Analog Control" Using Pulse-Width-Modulation (PWM), you can apply a digital on-off valve for analog control. This reduces hardware costs. However, process impacts need to be fully understood. This presentation examines the application of PWM valve control in a new pharmaceutical facility. Design, configuration, and tuning recommendations will be presented. Using PWM means introducing cyclic behavior to the process. The paper compares the impacts of this, and weighs it against the cost savings. In addition, the practical effects of controller sampling rate, cycle time, and valve response are characterized. The attendee will learn about the pros and cons of using a PWM strategy. Specific configuration and tuning practices for PWM loops will be proposed, including relationships between cycle time, resolution, valve performance, and process characteristics, such as deadtime, process time constant, and gain.

Modeling of Interval Systems by Polynomial Derivative
Speaker(s): Maruthai Suresh

Due to uncertainties present in the system components, the system transfer function coefficients would subject to vary. If the variations are within a limited interval, the system is said to be interval system. The interval system having the higher order transfer functions will create complexity in the analysis of the system. To avoid the complexity we can analyze the system after the reduction process. There are so many methods available for model reduction. But the validity of the method is based on the resulting error. Also the model reduction procedure should be computationally simple and give close response to the original system. In the proposed method the numerator polynomial can be reduced by using Markov parameters and time moments techniques, which will retain the initial Markov parameters of the original system. The denominator polynomial can be reduced by using the reciprocal transformations and the differentiation techniques. This method overcomes the limitation like formation of long Routh type arrays. By maintaining initial Markov parameters and time moments, the higher system responses of both steady state and transient state are retained. Step responses are plotted using Matlab and they are compared and the results are satisfactory. The major drawback of this method is that it cannot be implemented for systems having a difference of more than one in the order "s" of the denominator and numerator polynomials. The method introduced in this paper avoids the necessity of gain factor. It generates stable reduced order model for order "r" retaining "t" time moments and "m" Markov parameters of the original system.

Monitoring and Optimizing PID Loop Performance
Speaker(s): Randy Burch

Implementation of a distributed control system (DCS) produces significant regulatory control benefits by distributing process control intelligence across an integrated architecture of application modules connected by a communications network. After implementation, DCS economic benefits are realized by reducing overall and maintenance costs through integration and the use of common hardware and software control components, as well as system-related training expenses. Networking and communications technology advancements have also resulted in significant cost reductions and increased system reliability.

Tuning Loops Quickly as Start-up
Speaker(s): Michel Ruel

TRADITIONAL METHODS

Traditional methods for PID tuning loops require tests and are not always possible at start-up. This paper presents methods to quickly have acceptable numbers during a start-up. DEFAULT VALUES Default values for common loops (flow, pressure, temperature, …) will be given. Tricks to estimate acceptable parameters will also be presented. ESTIMATES The dead time is easily estimated using common practice in piping or using rules of thumb. For example most instrument adds between 0.5 and 1 s to the dead time. The time constant is directly related to the mass or to the volume. TURNING START-UP PROBLEMS IN GOOD TESTS FOR TUNING All events (pump start-up, mode change, setpoint change, …) are used to evaluate the dead time and the process gain. Once the dead time is known, integral, derivative and filter time constant are quickly adjusted. Looking at steady state values, the process gain is also quickly estimated.
**Pulp & Paper Division Sessions At ISA Expo 2004**

**Automation in the Pulp & Paper Industry - (P) October 6, 2004, 10:00AM - 11:30AM**

**Case Story: Using Performance Monitoring and Optimization Tools for a Paper Machine Start-up**  
**Speaker(s): Jean Lagace & Serge Naud**


**Improvement in AC Electromagnetic Excitation Increases Efficiency, Improves Quality and Conserves Energy**  
**Speaker(s): Blake Doney & Greg Livelli**

The pulp and paper industry holds some of the most aggressive and challenging applications for electromagnetic flowmeter measurement. Changing operating conditions, higher pulp consistencies and tighter process control are pushing the boundaries of electromagnetic flowmeters. Conventional electromagnetic flowmeters using DC excitation have been used to measure pulp stock into the head box. However, since pulp stock tends to be a noisy measurement with a magnetic flowmeter, long dampening times are traditionally used to smooth the output of the meters. This results in slow response times from the meter and ultimately leads to wasted pulp. Reducing the dampening will result in quicker response times, however a noisy signal compromises the thickness or “basis weight” of the end product. Improvements in AC electromagnetic flowmeters now provides paper mills improved performance, quick response and a noise free output that traditionally achieved with DC technology. An improved excitation process and advanced digital signal processing results in tighter process control, faster response, greater profits and a direct cost savings. The improvement in the excitation process also eliminates the zero drift problems associated with traditional AC meters and provides greater noise handling capabilities than DC magmeters. Therefore, lower dampening values can be used to maintain tighter controls resulting in less product variability. Now user can obtain ±0.5% rate accuracy with extremely quick response times. Pulp and paper mills require accurate and timely information to maintain operational cost efficiency while meeting customer quality expectations and regulatory demands. The improved excitation method in AC electromagnetic flowmeters has set a new standard for flow measurement in the pup & paper and allows users to increase efficiency, improve quality and conserve raw materials and energy. AC magmeters now have the versatility to measure the simplest to the most extreme flow applications making the process more productive and profitable.

**Real-time Performance Management in Pulp and Paper**  
**Speaker(s): David Stockford**

Real-time Performance Management (RtPM) systems enable real-time decision making for pulp and paper manufacturers to continuously improve operations, providing tools to implement Six Sigma or similar initiatives that minimize production deviations, maximize product quality and divert off-quality products before they become problems. Using RtPM, they can also implement condition-based maintenance programs to reduce costly maintenance problems by giving process equipment the maintenance attention required before failures occur. Users are able to record and report plant downtime allowing them to collaborate more easily to reschedule production orders. With RtPM, production and enterprise information are integrated and analyzed based on performance criteria such as Key Performance Indices. Automated real-time events and alerts are distributed to operators, asset managers, and other key personnel in position who can take intelligent action. Raw material consumption, energy consumption, environmental pollutant levels and equipment downtime are tracked and optimized across all production units, improving profitability. The balance between pulp mill production and paper machine demand is improved, grade changes are better managed and the paper quality is closely monitored providing increased production and improved quality of the finished products coming off the paper machines. With RtPM, different operating units, sites, and departments can be integrated to allow sharing of best practices for company-wide improvements.
Pulp & Paper Division Sessions At ISA Expo 2004

Web-Based HMI's - (P)
October 6, 2004, 10:00AM - 11:30AM

Using active server pages, intelligent serial devices, HTML, SOAP, WML, XSL, FTP, WML, OPC and ActiveX, and internet/intranet technologies to create web-based HMIs. Web technologies provide new opportunities to implement Human Machine Interfaces (HMI) applications using new technologies that leverage high-speed communication to industrial hardware to view real-time plant/production data over a Plant Intranet. This future communication architecture will provide a bridge between current proprietary systems to an open environment based on Ethernet and Web technology. The evolution of web-based HMI has allowed real-time information from automation systems to be accessible to anyone in the corporation and offer interoperability using a flexible, open standard giving us new ways to access and deliver data in industrial automation. Because of the proliferation of browser-based, thin-client, operator interfaces in all of the major HMI's, this panel is a continuation of the Web-Based HMI panel from last years Expo 2001. Like last years panel of the same name, five or six representatives from the major vendors/providers (YTBD) will sit on the panel each giving a 5 -7 minute PowerPoint presentation followed by an audience Q&A period.

Panelists:

Ethernet I/O - (PL)
October 6, 2004, 2:00PM - 3:30PM

A five-member panel will discuss de-factor standard ethernet-based I/O, data acquisition and control, networking, for costeffective, distributed monitoring and control solutions with practical applications. Explore quick and simple programming using a web browser. Explore modular I/O. Like last years panel of the same name, five or six representatives from the major vendors/providers will sit on the panel each giving a 5 -7 minute PowerPoint presentation followed by an audience Q&A period.

Panelists:
Scott Saunders – Moore Industries
Benson Hougland – Opto 22
Don Lupo – Acromag
Don Holley –
Larry Komarek – Phoenix Contact
G.Kevin Totherow – Sylution Consulting
Today as many companies face the reality of downsizing and cost control, they have found themselves without resources to carry on programs that once yielded significant returns. Reliability programs are no exception. Corporate reliability groups find themselves at half the staff they had just two years ago. Local predictive maintenance programs no longer exist because an early retirement program sent their expertise out the door. Many maintenance professionals are finding that expertise difficult to cultivate in a reasonable amount of time. Still other programs do not have the funds of maintaining the capital investment of software and hardware, leaving their technology obsolete. One answer to the problem is to completely outsource various services such as vibration analysis to a service provider but this solution can be accompanied by problems of responsiveness, especially for plants located in remote areas of the country. This paper discusses an approach to this problem in which the reliability program remains with the plant and qualified personnel perform the analysis of data. Plant maintenance personnel in this shared approach perform the process of acquiring the data. By leveraging the Internet, it is now possible to transmit machinery condition data anywhere efficiently and reliably. The plant has access to the data collection equipment 24 hours a day and can collect machinery data on a schedule convenient to their scheduling process. They only pay for the analysis of the data, thereby eliminating costs associated with training, travel, software maintenance, and employee turnover. Many plants realize a program cost that is half of what they had when they maintained a full-time vibration analyst. Yet they still maintain the accuracy, responsiveness and flexibility of an in-house program. This paper discusses the topics of applicability, cost, setup and logistics of an internet-based Machinery Analysis program. Other topics include keys to success, current and future capabilities of this approach.

Reaping the Rewards of Remote Monitoring and Diagnostics Programs
Speaker(s): Scott Lapcewich

The ideal factory environment is one that has near 100% service delivery and negligible unplanned downtime. Under these conditions, a plant is the most efficient, productive and profitable. What is the best way to achieve these conditions? Although many options are available, a continuous, on-line monitoring system is one of the most effective ways to significantly increase productivity. When properly implemented, these systems allow real time production data (e.g., temperature, pressure, flow rate) to be collected, monitored and analyzed around the clock. This ability gives manufacturers a comprehensive view of process line activity that is unprecedented in scope, detail and accessibility. This presentation will use real paper industry examples to discuss the benefits and cost savings of implementing continuous control system monitoring (CCSM), and how to choose the right type of on-line monitoring system for your organization.

Tools to Troubleshoot Processes
Speaker(s): Michel Ruel

Data Transmission & Quality - (P) October 6, 2004, 3:45PM - 5:15PM

Data Quality Standards for Intelligent Devices
Speaker(s): Graeme Wood

Digital communication technology is widely used for data transfer in industrial measurement and control systems. It enables intelligent devices to communicate not only their current data values but also data quality parameters that greatly increase the value and usefulness of the data. These data quality parameters can report the results of device self-checking and internal performance compensation together with measurement inputs and control outputs. These additional parameters and attributes are known as "Data Quality Metrics". This paper presents key features and benefits from the recently published UK national standard BS 7986 "Industrial process measurement and control - Data quality metrics". BS 7986 is an open standard providing a generic, and device independent, format for reporting data quality from all types of sensors and actuators. It provides a stable and consistent way for designers to express device performance and for higher-level applications to take advantage of additional data beyond the bare measurement. BS 7986 includes reporting of uncertainty for real-time and on-line data and is compliant with the general rules of ISO/IEC "Guide to the expression of uncertainty in measurement (GUM)". The specification has been harmonised to support inter-working with measurement indices used in Foundation Fieldbus and ProfibusPA.

Feedback Control Schemes for Disturbance Rejection I the Wet End of a Paper Machine: Mimicking a Process Simulator
Speaker(s): Michael Waller


Dynamic process simulators offer the user a chance to examine the performance of a process as it reacts to disturbances. Unfortunately, becoming functional in the use of the simulator for a new process is often a time-consuming stumbling block, preventing casual application. One method of mimicking a process simulator is through the use of control system software. In this case, the 20SIM control system software is used to mimick the behavior of the wet end of a paper machine undergoing feed upset. The use of 20SIM is illustrated with a simple water recycle and dilution process where stream consistencies versus time are analyzed for an upset in fresh stock feed consistency. The model consists of a first-order lag and a short dead time, and is first analyzed in open-loop fashion. Plots of consistencies at various points around the flow loop are made, comparing results with practical papermaking experience. It is seen that very long times (many time constants) are necessary for the process to achieve steady-state. For closed-loop feedback control, when the objective was to return the process to its original condition, schemes of PI, PID and IMC control are employed which achieve rapid, robust results. Performance criteria were 5% settling time, and ITAE as the error integral. With PI control as the standard, modest improvement was achieved with PID control because of the relatively short dead time, while IMC control improved ITAE with some loss of settling performance.

Choosing the Right Cable for Data Transmission
Speaker(s): Jacob Ben Ary


In this paper, a family of graphical representations and equations has been developed to gain a solid basic understanding of twisted pair transmission lines used for digital signal transmission. The approach of graphical representation and some basic simple equations requires a little background in electromagnetic field theory. Digital data communication is of
increasing importance in industrial automation, with no sign of slowing down. Applications such as industrial Buses, industrial Ethernet and industrial LANs are becoming part of plant and process implementations. A common component in all the applications is the communication channel. This may be a transmission line consisting of cable, optical fiber, waveguide, ‘free space’ propagation (wireless), etc. This paper is concerned with copper conductor twisted pair transmission line cables.
Dr.-Ing. Dirk A. Lindenbeck did receive his doctorate for research in application of diamond grinding wheels at the University of Hannover, Germany. He continued his research at the De Beers Diamond Research Laboratory in Johannesburg, South Africa, for three years. Subsequently, he built and ran two diamond tool manufacturing plants in Brazil and South Carolina, USA, for 11 years. As assistant to the Chairman of the Board of INA Bearing in South Carolina for 2 years, he was involved in all aspects of top management with special emphasis on the application of diamond tools and modern quality control systems. Since 1987, he owns B+E Manufacturing Co. Inc. and Stainless Valve Co. B+E is a service company performing machining on CNC milling and turning centers, assembly of manufactured components, and measurement on a Coordinate Measurement Machine. Stainless Valve Co. is a sales company selling specialty valves to the chemical and food industry, mining, pulp manufacturing, and power generation.

In mining, the food industry, and pulp manufacturing, there are valve applications where the standard valves used do not function satisfactorily. When scale is formed on the moving elements of ball valves or gate valves, the consequence is either blocking of the valve movement or damage to the valve seats and consequent leaking through the valves. A development of AS Stargate-O-Port valves was carried out in 1996, which lead to a good performance in pulp manufacturing. Later, the same principle was used in the food industry. The most impressive application was in mining, where standard valves had to be exchanged every two weeks, whereas the Anti-Scale valves are in operation now for three to four years without any need for refurbishment. The increased production by eliminating downtime has paid many times already for the investment in the valves.

Electronic Valve Controller
Speaker(s): Stanley Miller

CCI has developed a new electronic valve positioning system that significantly advances the technology of actuators and positioners. The QuickTrak™ system has all the features of advanced “smart” positioners but provides high-speed, precise positioning without using any mechanical linkages, boosters, quick exhaust valves, or other accessories. The device uses a high-speed stepper motor driving a large pneumatic spool valve to provide rapid valve positioning with no overshoot. The position feedback is provided by an integral non-contacting magneto restrictive probe with measuring capability of 0.0001 inch. For conventional actuation systems, the complexity of tuning a digital positioner and analog accessories can take up to four hours. However, the QuickTrak™ electronic controller allows one-button tuning either directly on the control panel, via a hand-held communicator, or from the plant DCS system using HART or an equivalent communication protocol. This enables the system to be calibrated and tuned in a matter of minutes. Extensive laboratory and field testing has been conducted to compare all aspects of the valve and actuator performance regarding hysteresis, dead band, resolution, and overshoot using QuickTrak™ and conventional systems. Comparative data has been taken to show the improved positioning resolution in difficult process control applications.

Establishing Control Valve Trim Flow Area
Speaker(s): Gerald Liu & Herbert Miller & Laurence Stratton

Herbert L. Miller (Herb) is a consultant for the control valve industry. Prior to this, he was Vice President of Technology and Standards for CCI. He has authored over 45 articles on heat transfer and fluid flow technology. Technical articles on control valves have included many applications dealing with corrections to improperly applied valve designs. The applications have been concentrated in the severe and tough service installations of the electrical power generation and oil and gas handling industries. He has been a senior member of the ISA and its technical committee on control valves since 1984 and has been active on the noise and cavitation subcommittees. He has been a member of the American Society of Mechanical Engineers since 1963 with leadership in Sectional and Regional Administrative roles as well as technical committees dealing with materials and qualification of mechanical and electrical equipment in nuclear power plants. Prior to joining CCI in 1979, Herb was Manager of Nuclear Projects at Bailey Controls from 1973 to 1979 and prior to that he was with the Babcock and Wilcox Research Division - Analytical Group for Heat Transfer and Fluid Flow responsibilities.

A method is provided for establishing a control valve trim’s throttling exit flow area by measurement and/or calculation using readily available information in the technical literature and known process conditions in the fluid flow field. The
throttled area at the exit of the trim is needed to determine the velocity and energy content of the fluid jet leaving the valve trim. The velocity and energy levels of this jet are essential in judging the ability of the valve design to provide good control while minimizing the detrimental affects of cavitation for liquids and noise for gases. Both of these effects can also lead to unwanted vibration of the piping systems and excessive maintenance even when the detrimental effects are minimal. In addition, knowledge of the fluid velocity in the jets can also aid in judgments regarding erosion of valve internal components. The method requires knowledge of the valve Cv, the variables used in the calculation of the Cv such as flow rate and pressure drop, and an estimate of the flow loss coefficient for the valve trim. It is this later item that is not readily available from the valve manufacturer; however good estimates of the value of the loss coefficient can be made from results available in literature dealing with pressure drop through different constrictions. Examples of the loss coefficient are provided for a number of valve trims as an aid in understanding the method.
**LETTERS TO THE EDITOR**

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:

writes:
Nothing from anyone there this time!

Nothing from anyone there this time!

Nothing from anyone there this time!

Nothing from anyone there this time!
2004 Pulp & Paper Industry Division Officers

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

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

Former 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
Dr. Leoncio Estevez-Reyes, P.Eng.
Schweitzer-Maudit – Spotswood Mill
(732) 723-6135
leoncio_estevez-reyes@swm-us.com

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

ADDRESS CORRECTION REQUESTED