Setting the Standard for Automation

ISA **Wilmington Delaware** Section

The Sensor

September 2007

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Upcoming Events

Sept 25	**MPC Applications at ACE**
Oct 2-4	**ISA Expo in Houston**
Oct 23	**Section Meeting at ACE**
Nov 27	**Section Meeting at ACE**

September 25, 2007
Model Predictive Control
Phillip D Schnelle of DuPont
5:30 PM at ACE in Newark

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Model Predictive Control

This paper will discuss the application of state-space Model Predictive Control (MPC) technology to a commercial scale dilution / pasteurization / dryer feed process. The goal of this application is to debottleneck a rate constraining step of this process by improving the regulatory control of rate, inventory and composition / quality controls and using the local optimization to drive overall production.

The scale and scope of this application is significant because it is representative of many smaller-sized control problems in industry. Such problems generally have a handful of manipulated and controlled variables, significant dynamic interactions, one or more integrating variables, and a composition variable that must be tightly controlled in the face of significant unmeasured disturbances. They frequently require control strategy changes due to process and product requirements. State-space MPC technology is uniquely suited for such applications.

This work is the result of a joint effort between a vendor with a new product (SSC) and a commercial customer interested in testing and applying this new technology to a commercial problem in order to improve quality, yield and throughput. This is a good example of how vendors and customers can work together to introduce and test new technology.

President's Message

By Bill Balascio

Hello everyone, and welcome to a new year with the Wilmington Section of the ISA. This is my first president's letter where I actually have to think about what I want to say. Last month's letter was much easier – all I did was introduce the Executive Committee.

I guess I'll just start out by talking a little about how I relate to the ISA, and where I see this section and the ISA going.

I am no historian, but I am sure it is safe to say that the work world has changed a great deal since the time when this section was founded. In its early years, this section was built upon the strength of the DuPont Company's central engineering department.

While quite a few years after that, when I first joined this section, over 10 (or is it 15?) years ago, this was a very active and strong section. The annual picnic was quite an event, with fully staffed Users and Vendors teams. The fate of the following sales year depended upon which team won those games! Times change, the picnic draws fewer people every year, and the softball game is a fading memory.

Some may think that this is one sign of a failing or fading section – nothing could be further from the truth! Our section is still one of the most active, and is lucky enough to have a dedicated Executive Committee staffed with energetic people.

The changes that we see are more a sign of how the work world has changed, and how ISA has changed. Professional societies used to be the place to learn about the latest technologies – now we all seem to get that type of information through the internet, and seem less interested in networking with our peers.

While the internet may be a good way to get a great deal of information quickly, it cannot replace the social interaction and networking skills that you will acquire by seeking out and interacting with your colleagues at a section meeting or Executive Committee meeting. You may be able to pick out the latest transmitter or controller from the on-line catalog on a vendor website, but that catalog won't convey the 20 or more years of applications experience that you might be able to tap with a personal contact. An on-line catalog or course also won't be able to refer you to possible sales or job contacts.

Come and join us, you just might enjoy yourself, while you're learning something.

WISA Bylaws

The WISA executive committee has made revisions to the section bylaws.
The bylaws are posted on the WISA website.
The bylaws are open for review and comment by any member of the section.

A Shocking Tale

AC/DC
by Tom McNichol
BB (Boring)
Reviewed by Nick Sands

In recent months there have been many discussions about the development of a wireless standard and the fear of a repeat of the so called Fieldbus wars. Tom McNichol delivers a warning that standards wars are nothing new in his book, AC/DC: The Savage Tale of the First Standards War. McNichol is a contributing editor for Wired magazine and has contributed articles to the New York Times, Salon, the Washington Post, and the Guardian. His radio commentaries and satires have aired on NPR's All Things Considered, Morning Edition, and Marketplace. He is also the author of Barking at Prozac.

McNichol provides a brief history of electricity from the cave man's experience with lightning to the development of the Leyden jar by Pieter van Musschenbroek. The first character in the story is none other than Ben Franklin, who in six short years performed many experiments in electricity and developed the lightning rod. He did not experiment with lightning striking a kite as commonly depicted. The great experimenter Michael Faraday, inspired by Alessandro Volta, developed the transformer, the generator, and the electric motor by 1831.

Edison, born in 1847, had little education, but great curiosity and energy. He was inspired to become an inventor by Michael Faraday's experiments. The first of his many patents was for an electric vote recorder, but his first great invention came in 1877; the phonograph. Edison witnessed the electric lights of the day, high voltage direct current arc lamps, and had a vision of the future. Forming the Edison Electric Light Company with investor's capital and no products, he went about the systematic development of not only the first long lasting incandescent light bulb, but also the electrical generation and distribution system needed to light the world. His persistence is legendary, testing over 1,600 materials by trail and error for the right filament to use in the vacuum sealed one piece bulbs.

During his invention of the light bulb and the construction of the world's first electrical power plant on Pearl Street in New York City, the gas companies that had previously provided light, publicly attacked electricity as dangerous and deadly. But on September 4, 1882, Edison's electric lights powered by Edison's power station, first lit Wall Street. The lights and motors were powered by 110 volt direct current. Edison, and his associate Harold Brown, used similar public accusations against George Westinghouse and his alternating current electricity, which is the core of McNichol's story. The details are shocking.

Standards & Practices: SP91

Criticality Ranking for Instrumentation

By Nick Sands

The SP91 committee has been actively meeting. The chairman is Rick Dunn of DuPont. At the last committee meeting a motion was made to disband SP91 and allow the SP84 committee to assume ownership for the topic of critical instrumentation.

The committee was formed with the purpose of defining what instrumentation and instrumented functions were critical under OSHA PSM, 29 CFR 1910.119 and EPA RMP, 40 CFR Part 68. A standard and a technical report were written by the committee.

The procedures, documents, and terminology defined by this committee should be suitable for use with instruments and control systems in all industries except nuclear. Areas of interest shall take into account factors such as personal injury, equipment loss, and downtime.

ISA-TR91.00.02-2003 Criticality Classification Guideline for Instrumentation

This guideline is developed to assist engineering, operations, and maintenance personnel with establishing the classification of their instrumentation, thus facilitating all aspects of designing and maintaining reliable operating facility instrumentation.

ANSI/ISA-91.00.01-2001 Identification of Emergency Shutdown Systems and Controls that are Critical to Maintaining Safety in Process Industries

This standard addresses the instruments that are classified as emergency shutdown systems and safety critical controls and establishes requirements for testing and documenting the test results of these systems.

This standard does not address codes, regulations, and other requirements that apply only to the nuclear power industry.

WISA Trivia Question?

Who is the current president of the Wilmington Section?

Email your answer to
WISA newsletter editor Nick Sands
At nicholas.p.sands@usa.dupont.com

Win an ISA shirt.

Phillip D Schnelle of DuPont

Phillip D. (Dave) Schnelle is a Principle Consultant in the DuPont Engineering Technology Process Dynamics and Control Group, located in Wilmington Delaware. Dave has 32 years with DuPont, at various corporate and plant assignments including project engineering, site assignments (Texas) and corporate consulting groups. His current technology interests include dynamic modeling, advanced control applications (regulatory and MPC), data modeling (MVA, TSA ...) and interfaces between SPC and APC (LFPI, Performance Monitoring).

WISA Nite@Blue Rocks

By Rusty Shackleford

There was a chill in the stadium before the Wilmington Blue Rocks and the Myrtle Beach Pelicans threw the first pitch. The game was hot then cold then hot and ended cold as the lead changed. There was no shortage of baseball action though with 24 hits in the game. The Blue Rock took an early lead with 2 runs in the first, but the Pelicans answered strong in the second with 7 runs. Though it looked bad, in the next two innings the Blue Rocks tied it up at 7 all. At the end of the 5th, the Blue Rocks could pull it out. Then in the 6th, the Pelicans scored three more runs and sent the challenge. There was spirit and effort, but the Pelicans scored 3 runs in the 6th. The Rock tried again to rally as the WISA members looked on from the warmth of the skybox, but the Pelicans held on to win 10-8.

Management Division

The Management Division's mission is to support ISA membership, from all industry segments, who are involved (or having an interest) in management as it relates to instrumentation, systems and automation assets to help them compete more effectively both professionally and personally in today's global marketplace.

Areas of division focus broadly include

- People Management
- International Management
- Marketing and Sales
- Industry Standards, Patents, Legal
- Operational Assessment
- Education, Training & Certification
- Project Management
- Maintenance Information & Management
- Asset Management Systems & Software
- Predictive Maintenance Techniques & Software
- Supply Chain Management
- Plant Modernization & Optimization
- Manufacturing Operation Management Systems

Water & Wastewater Division

The Water & Wastewater Industries Division (also known as WWID) is organized within the Industry and Sciences Department of ISA. WWID was established as a means for information exchange among professionals working with instrumentation related to commercial and public systems associated with water and wastewater management.

The ISA Water and Wastewater Division is concerned with all aspects of instrumentation related to commercial and public systems associated with water and wastewater management. Membership in this Division provides the latest news and information relating to instrumentation and control systems in water and wastewater management, including water processing and distribution, as well as wastewater collection and treatment. WWID is invaluable to professionals interested in sanitary technology and engineering, and the operation and maintenance of wastewater facilities. The Division sponsors a yearly symposium, with a proceedings volume.

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A Shocking Tale Continued…

Nikola Tesla's invention of polyphase power to drive his AC motors was an elegant solution to George Westinghouse's problem of finding the right way to show the advantage of alternating current. But it took the successes of the Ames hydro-electric power plant in Telluride Colorado in 1891 and the World's Columbian Exposition in Chicago in 1893 to tip the scales to alternating current.

The story of the war between Edison and Westinghouse is more about egos, money, and dirty tricks than it is about technology. Perhaps the same is true of most standards wars. If each were chronicled as McNichol has done we may learn some lessons. AC/DC is a quick read, but one without illustrations of the devices or a single equation. A little more historical and technical content would have put this book above BB (Boring). It is available at Amazon.com for about $18.