Setting the Standard for Automation

ISA

Wilmington Delaware
Section

The Sensor

April 2008

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Upcoming Events

April 22	**Shrimp Boil at ACE**
May 27	**OPC Section Meeting at ACE**
June 24	**WISA Picnic at Chestnut Run**

April 22, 2008
WISA World Famous Shrimp Boil
5:30 PM at ACE in Newark

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Shrimp Boil

Join us for the Famous WISA Shrimp Boil

Masters of the Shrimp
Joe Gunn & Mike Scott
North East Technical Sales, Inc.

Hosts of the Shrimp
Tim Cole & Alex Shields
Applied Control Engineering

Free food and beverages
Raffle prizes & Great company

WISA Welcomes New Members!
Charlene Carroll
Tong Li
Jamey Sweetland
WISA Welcomes New Members!

President's Message

By Bill Balascio

Happy Spring to everyone! We have had some nice weather lately, which reminds us that it really is springtime. Winter is officially over and it is time to start thinking about our yards, getting outside for some fun, and the Wilmington ISA Shrimp Boil.

O.K. I grant you that the Shrimp Boil is not on everyone's mind, but if you are a member of our section, you should be looking forward to April 22nd. We will be meeting at Applied Control Engineering's (ACE's) Newark office for our premier social event of the season. It is a great opportunity to catch up with your old friends, network, and have a face to face conversation with that ISA president who has been writing all of these letters. Oh, did I mention that you will be able to eat tasty shrimp and enjoy cold beverages!

It is also a good time to meet all of the other members of our Executive Committee and find out what we are all about. Ask us questions like: What interests us?, Where do we see the society going?, and the all important – What's in it for me?

Even if we aren't salesmen, we may reply with some similar questions of our own, but we can tell you where we see some of the major directions in which the society and our section will be going.

ISA is placing a major emphasis on advocating for the automation professional and as part of that is making plans for Workforce Development. Are you part of a small company that cannot afford its own training programs? If you are, I challenge you to become involved with our section and help direct our efforts to the benefit of your company, our community, and your own career.

That's what's in it for you – any interest?

Ralph Moore Scholarship

Each year the Wilmington section ISA extends a $1,000 scholarship to a high school senior who is planning to attend a 4-year college, University or a technical training school. An ISA member of our section must sponsor the candidate and applicants pursuing a technical or science degree will be given higher preference.

The scholarship committee will select the successful candidate. The application deadline is May 15 and the check written to the college of the candidate's choosing will be presented at the ISA Annual Picnic in June. The details of the selection criteria and the application may be found on the WISA website.

Building a Better Interlock

Guidelines for Safe and Reliable Instrumented Protective Systems by CCPS
BBB (Borrow)
Reviewed by Nick Sands

In 1985 the American Institute of Chemical Engineers (AIChE) formed the Center for Chemical Process Safety (CCPS) in response to industry demand following the Bhopal incident. CCPS has developed guidelines in a wide range of process safety topics. One of the new CCPS books is Guidelines for Safe and Reliable Instrumented Protective Systems which covers the management of systems to protect business needs as well as safety systems. Dr. Angela Summers, the primary author, is CEO and founder of SIS-TECH Solutions, author of over 50 papers on safety instrumented systems, and a member of the SP84 and IEC61511 committees. Summers, a PE in Texas, has a Ph.D. in Chemical Engineering from the University of Alabama and received the 2005 Sperry Founders award from ISA for her work with safety instrumented systems.

The introductory chapters highlight the standards and practices for safety instrumented systems (SIS), including ISA 84 and previous books from CCPS. Emphasis is put on the management systems needed to maintain the reliability and integrity of the instrumented protective systems (IPS). An overview of the IPS lifecycle previews the contents of the remaining chapters.

A key early step in the lifecycle is the risk assessment. This is when hazards are identified along with the consequences, and the frequency of the initiating events. Layers of protection are assigned until the risk is mitigated to an acceptable level. Depending on the consequence and the risk, the protective functions are classified, which determines how they are managed throughout the lifecycle.

Once the protection requirements are determined, the process requirements, including operability and maintainability needs, and I&E requirements, including the instrumentation and controls, are determined and verified to provide the required protection. Safe states, actions, process safety times and reliability requirements are common design specifications. Good engineering practices, testing methods, and maintenance philosophies are inputs to design.

The engineering, installation, commissioning, and validation phase of the lifecycle usually requires the most time and people, and is usually the most time critical. Activities include the detail design of hardware and software, including the operator interface, as well as field installation and validation testing. A factory acceptance test (FAT), is highly recommended prior to a site acceptance test (SAT).

Standards & Practices: ISA97 In-Line Sensors

By Nick Sands

ISA 97 is working on creating a series of standards on process connection dimensions for the various types of sensors such as flow meters, pressure sensors, and discrete devices. The chairman is the famous ISA Fellow, Ian Verhappen.

Current draft standards for flanged and wafer style vortex flowmeters have been balloted and expected to be issued soon.

March Section Meeting -

Opening the Black Box of Process Control and PID Loop Tuning

By Matt Murphy

This month, Bob Rice, PhD, from Solutions Engineering provided a light hearted yet comprehensive primer on PID loop tuning. The presentation was a refresher for most of the audience, but Dr. Rice introduced several jewels of enlightenment that expanded the knowledge of even the most experienced engineers in attendance.

Dr. Rice began his presentation with an overview of process control philosophy. This included a discussion of how improved control leads to an improved bottom line. He then proceeded to present very basic models of automated process control for temperature, level, and flow loops, using box diagrams to represent the sensor, controller, final control element, disturbances and filters.

Dr. Rice followed the basic model by adding a steady state mathematical representation of each of the box figures. This included an explanation of error, set point, output, and feedback for a proportional controller. He demonstrated how changing gain would effect the output for a given error (SP-PV). His explanation of gain was kept exciting by his Ferrari vs. Model T example.

Following his explanation of time constant, the model was then refined to show how longer and shorter time constants effect the control. The concept of integrating the error as a function of time was then added to the mathematical model.

He next showed how measurement delay time and final element delay times effect the model. The concept of integrating the error was added.

His balance of using the common life example then presented as a box model and expanded to a mathematical model was a different. The speaker was able to interject multiple examples of experiences he had where controls were not as desired and explain the reason why and what part of the model predicted that the control would fail. He then used the model to show how the control loop would be corrected.

Friends of the Shrimp

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Building a Better Interlock Continued…

Once the IPS is put into operation, its performance is dependent on the management practices for controlling bypasses, investigating failures and demands, and managing changes. Maintenance and test procedures are a critical task. Finally, improvements should be made based on test and demand data.

Summers and the CCPS committee have tried to address a real need by extending the principles of safety system design to functions for reliability and business loss protection. The style, perhaps a result of committee writing, is general and repetitive. Still, Guidelines for Safe and Reliable Instrumented Protective Systems is well worth reading. At $125, from Amazon.com, it may be a good book to borrow (BBB).

WISA Trivia Question?

What will Joe Gunn boil on April 22?

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

Win an ISA shirt.

ISA - Wilmington Section
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Not an ISA Member?
Join today at
WWW.ISA.ORG

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