



# Wilmington Delaware Section

# The Sensor

## April

2007

### In this Issue

1. WISA Shrimp Boil
2. President's Message
3. Standards: SP77 Part 3
4. Book Review: Measurement and Control Basics

### Upcoming Events

- April 24—WISA Shrimp Boil
- May 22—WISA Section Meeting
- June 19—WISA Family Picnic

April 24, 2006  
**WISA Shrimp Boil**  
**At the ACE office in Newark**  
**5:30 PM**

## SECTION OFFICERS 2006-2007

**Stephen Prettyman**  
**President**  
 Rohm & Haas  
 302 366-0500 x2808  
 spretty@rohmmaas.com

**Matt Murphy**  
**Membership Chair**  
 DuPont  
 302 999-6321  
 matthew.f.murphy@usa.dupont.com

**Your Name Here**  
**President-Elect Secretary**  
 Your company  
 Your phone number  
 yourname@yourcompany.com

**Mike Morkun**  
**Webmaster**  
 DuPont  
 302 774-4174  
 michael.b.morkun@usa.dupont.com

**Tammy Mukoda**  
**Treasurer**  
 DuPont  
 tammy.l.mukoda-1@usa.dupont.com

**Ken Lawrence**  
**Past President and Student Section Liaison**  
 KRL Marketing  
 krlmarketing@comcast.net

**Jennifer Slivka**  
**Program Chair**  
 DuPont  
 jennifer.k.slivka@usa.dupont.com

**Nick Sands**  
**Newsletter Editor**  
 DuPont  
 856 540-2080  
 nicholas.p.sands@usa.dupont.com

**Eric Waugh**  
**Program Chair**  
 DuPont  
 eric.j.waugh@usa.dupont.com

## Shrimp Boil

Join us for the Famous  
 WISA Shrimp Boil  
 April 24, 2007

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**

# President's Message

By Steve Prettyman

I write to you this month on Good Friday from my office in Newark, Delaware. The weather is variable and we are expecting unseasonable cold temperatures for the Easter weekend. We have had some warm weather recently; however, it was short lived very much like the remainder of my ISA Wilmington Section presidency.

At the annual picnic in June I will pass the gavel to my yet to be identified successor. This leaves only three months of my presidency, consequently, I have been reflecting on the events of the past two years. There have been the annual picnics, Blue Rocks games, and Shrimp Boils, as well as the monthly section meetings. There have also been 12 Executive Committee meetings and a highly successful and well received Automation Destination Exhibition and Training Show conducted during my tenure as President.

The bad news is that section participation is down, involvement has decreased, and volunteers are not coming forward. Two years ago the section lost Dan Roarty to a tragic car accident. Last year the section lost Debbie Lien to relocation to Asia. And last month the section suffered another loss as Kong Nyugen relocated to Houston, Texas.

To compound matters, the average age of the membership of the Executive Committee is steadily increasing, as a result, the most senior members are reducing their involvement but there are no young people volunteering to replace them. Even some of the most active members of the Section like Ken Lawrence have had to reduce their section involvement due to outside influences.

For months I have been writing to you to request your help and I have received no response. The ISA exists to serve you the end user, the engineer, the sales force and all the ISA asks in return is to show a little support by volunteering for the Section. If anyone reading this has been to a Section meeting lately, you have benefited from the efforts of volunteers. Consider giving back some of what you have received.

As I look around the room at Section meetings, I realize that many of those who attend regularly have contributed in the past and I thank you for that. As for the rest of you, and you know who you are, why haven't you volunteered for the Section? It is not an enormous commitment. Aren't a few hours a month helping an organization that you clearly value worth the time and effort?

Picture a world without the ISA. Ok maybe that is a stretch, but I can picture a world without a Wilmington Section. It isn't that far off if the section membership doesn't start volunteering. June is rapidly approaching and currently, no successor has been identified to replace me as President. We need other positions filled as well and we need volunteers to learn from the senior members before that knowledge is no longer available. Consider volunteering to keep the section alive, furthermore, consider volunteering to make the section thrive.

# The Way Measurements Work



## **BBBB (Buy)**

### Measurement and Control Basics

by Thomas Hughes

Reviewed by Nick Sands

Measurement and Control Basics is good review of the principles of operation of many measurements and final control elements, with many chapters updated for the 4th edition. Thomas Hughes is a long time member of ISA with over 30 years of experience including Dow Chemical, Rockwell international, and the International Atomic Energy Agency.

In the introduction Hughes tackles the age old problem of defining process control and process control systems, which contain the four elements of process, measurement, evaluation, and control. Next control loops, including the process model and the controller are reviewed, along with common tuning methods. A chapter covers electrical fundamentals, such as wire sizing, electrical components like transformers, and standard symbols. Binary, hexadecimal, and ASCII as well as Boolean logic, ladder diagram and function blocks are discussed in the chapter on digital fundamentals.

The next chapters focus on the measurement principles and technologies for pressure, level, and temperature. Pressure measurements shown include Bourdon gages, potentiometers, capacitance, and strain gauges. Level measurements shown include sight glasses, displacers, bubblers, capacitance, conductivity, ultrasonic, radar, and nuclear. Temperature measurements shown include filled systems, bimetallic, radiation pyrometers, and of course thermocouples and RTDs.

Hughes also covers a wide range of more analytical measurements, flow measurements, and final control elements, and the principles of operation. The chapter on analytical measurements includes conductivity, pH, density, humidity, turbidity, and gas detectors. The flow measurements shown include orifice plates, venturis, wedge meters, pitot tubes, turbine, vortex, magnetic, ultrasonic, coriolis and rotameters.

The last two chapters focus on the rest of the control loop, the final control element and the controller. Hughes provides a good primer on control valves, from sizing to characteristics, to choked flow. AC and DC motors are also covered. The development of modern controllers is given, with a generic DCS architecture and more detailed overview of the functionality of a PLC.

In Measurement and Control Basics, Hughes provides a guide for many types of measurements and how they work. This is a great introduction to instrumentation for new automation professionals, worth reading and worth buying. It is available for \$85 (member price) at ISA.Org.

# Standards & Practices: SP77 Fossil Power Plant Standards

## (Part III)

By Nick Sands

This committee is one of ISA's most active standards committees. The scope is to develop instrumentation standards for use in fossil power plants, documenting through standards publications: criteria, standards, practices, and procedures related to instrumentation controls in fossil power generating stations. The chairman is David Roney. Here is part of the description of SP77 committees and standards.

ISA-RP77.60.05-2001 (R2007), Fossil Fuel Power Plant Human-Machine Interface: Task Analysis provides guidance and suggests an approach for conducting a task analysis as part of the design and development of new control rooms/systems for power plants and for supporting major control room upgrade programs. The basic premise is that task analysis data, when collected early, is beneficial throughout the design process and serves to identify instrumentation needs, assist in evaluating design options, and in validating completed designs for human-machine interface concerns.

ANSI/ISA-77.70-1994 (R2005) Fossil Fuel Power Plant Instrument Piping Installation covers the mechanical design, engineering, fabrication, installation, testing, and protection of fossil power plant instrumentation sensing and control lines. The boundaries of this standard span the process tap root valve to the instrument connection. This standard applies to all fluid media (liquid, gas, or vapor).

ISA draft S77.82.01 Selective Catalytic Reduction (SCR) Control Systems addresses the control functions associated with the selective catalytic reduction systems on fossil fired steam boilers greater than 200,000 lbs/hr and combustion turbines greater than 25 megawatts. This includes the outlet NOx control using ammonia flow control, startup and shutdown logic, bypass/isolation logic, dilution air system control, ammonia storage and delivery system control, and catalyst cleaning systems. Urea to ammonia system are excluded from the scope of this document.

## 2006 Ralph L Moore Scholarship

By George C. Bentinck

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 Wilmington Section ISA website [www.isa.org/community/wilmi](http://www.isa.org/community/wilmi) after March 15, 2007.

# WISA Shrimp Boil

## Friends of the Shrimp

Joe Gunn & Mike Scott  
North East Technical Sales, Inc.  
215-513-1000 410-404-8588 Direct  
[www.netechsales.com](http://www.netechsales.com)

Brian Callahan,  
Pro-Tech Solutions  
410-838-7628  
[www.pro-techsolutionsltd.com](http://www.pro-techsolutionsltd.com)

**Lori Levangie,**  
**Tyco/Scott Health and Safety**  
508-596-5674 (mobile)  
[www.scottinstruments.com](http://www.scottinstruments.com)

Walter Bott  
Aspentech  
[www.aspentech.com](http://www.aspentech.com)

Steve Spangler  
Ohmart/Vega Corp.  
513-604-2049 mobile  
<http://www.ohmartvega.com>

Mechanical Design Solutions  
& Graphic Design Solutions  
302-659-0233  
<http://www.mds13.com>

## Boil Buddies

Joe Baker—Endress + Hauser  
Cell: 610-996-1797 Office: 215-712-9050 x104  
[www.us.endress.com](http://www.us.endress.com)

Paul D'Andrea, - Pro-Quip  
973-253-0100  
[www.pro-quip.com](http://www.pro-quip.com)

Jeff Carrier—WIKA Instrument Corporation  
888.945.2872 Tel. 302.559.0184 Direct  
[www.wika.com](http://www.wika.com)

**Mark Goehring – TRIFLOW Corp.**  
800-678-4908  
<http://www.triflowcorp.com>

Clark Minter, Tyco Valves and Controls  
484-941-2940 (mobile)  
<http://www.AGInstrumentation.com>

Tim Cole, Applied Control Engineering  
302-738-8800  
<http://www.ace-net.com>

Nick Sands  
WISA  
[www.isa.org](http://www.isa.org)

**WISA Shrimp Boil  
April 24, 2007**

**Friends of the Shrimp**  
**North East Technical Sales, Inc.**  
**Pro-Tech Solutions**  
**Tyco/Scott Health and Safety**  
**Aspentech**  
**Applied Control Engineering**  
**Mechanical Design Solutions  
& Graphic Design Solutions**  
**Ohmart/Vega Corp.**

## **President's Message cont..**

Without volunteers, the ISA would cease to exist and without DuPont, the Wilmington Section will cease to exist. Seriously. You can stop this from happening but you must take action, no one is going to do it for you (not even DuPont) and it is not going to do it by itself.

I will take this opportunity to thank the Executive Committee that has supported me during my two years as your section president. Thanks go to Nick Sands, Tammy Mukoda, Mike Morkun, Matt Murphy, Kong Nguyen, P. C. Gopalratnam, George Bentinck, Bill Balascio, Ken Lawrence, Jennifer Slivka, and Eric Waugh. Special thanks go out to Cullen Langford and Bob Crowder who have mentored me and helped to provide the guidance and the leadership that the section requires to continue being a viable organization.

## **ISA S95 Standard Reference Models by Ray Walker of DuPont**

Ray is an engaging and thorough speaker with extensive subject matter expertise in ISA S95. Ray provided a framework within which to search the standard and suggested that any user attempting to implement S95 perform a similar construct to improve the ability to search for the required material within the standard. The standard is not a how to, but rather a means by which to define and address the relationships between data.

ISA S95 defines the boundaries between Enterprise Resource Planning (ERP) systems, Manufacturing, and Control Systems. The standard is divided into unique parts that help to provide the user with a format with which to approach the complex relationships involved in today's manufacturing environment.

Part one involves definitions of the models. This includes a hierarchy with a data flow diagram including environments such as production, maintenance quality, and inventory.

Part two is more complex and involves information technology. This includes the process segment capability and the relationships involved.

Part 3 involves the activity and operation models. This involves the requests and responses and provides the application boundary.

Part 4 defines the attributes of operations management.

Part 5 involves the transactional model including data messaging, manufacturing interoperability guidelines and working groups.

Applications domains overview includes typical automation engineering activities, and a high level process map to decompose. This helps to measure and estimate the business value, as well as analyze suppliers capabilities.

**ISA - Wilmington Section  
P O Box 9245  
Newark, DE 19714-9254**

### **Sensor Trivia Question**

Where did Steve write his column?

Send your answer to  
[Nicholas.P.Sands@usa.Dupont.com](mailto:Nicholas.P.Sands@usa.Dupont.com)

Win an ISA shirt.

### **ISA Member Benefits**

Free access to:  
ISA Standards  
ISA Technical papers  
ISA Webinars