Director’s Message

by Roger Hull

Happy New Year! Even though I’m writing this Director’s Message in December, I know the Y2K event was a big non-event for the power industry. Utilities, vendors, and A/Es were very busy in 1998 and 1999 making sure of that. As we move forward into 2000, the Power Industry Executive Board has been very busy as well. Here are a few of our highlights.

At the Fall ISA TECH/1999 meetings, the Power Industry Division received ISA’s “1999 Outstanding Division” Award. This is the second year in a row that we have been so honored. I would like to personally thank all of the board members for their support over the past year. It truly takes a team of individuals that spend the time and make the effort in order for a division to work smoothly and successfully. And it shows! Congratulations to all.

Please mark your calendars today for our upcoming ISA/EPRI Power Conference. We will be in San Antonio, Texas for the 43rd POWID Symposium. Again this year, EPRI will assist with the technical program. This is our tenth year working with EPRI. In addition, Power Magazine will be helping with the promotion and publicity for this key conference. This year’s meeting will be held 4–9 June 2000 at the brand new Westin Hotel located on the famous downtown Riverwalk. More details regarding this conference are included later in the newsletter. I hope to see a record turnout for this conference.

This is also the time of year when nominations are accepted for POWID’s Annual Achievement Award and Facility Award. If you would like to make a nomination, the form is included in the newsletter, available on the POWID Website, or you can contact our Honors and Awards Chairman, Milt Neher. As reported in the last newsletter issue, Ron Johnson of Sargent and Lundy was last year’s recipient of the Achievement Award, and Montana Dakota Utilities—Hesket Station won the Facility Award.

As always, please feel free to contact our board via our website (http://www.isa.org/~powid) if you have any questions, comments or ideas that will help our division be of better support to our members. Our division Website is loaded with information and provides continual updates as to new activities. Check it out regularly to keep up to date.

Once again I hope you all have had a Happy New Year and I hope to see you in San Antonio in June.

Roger Hull
POWID Director
ISA Power Industry Division

Conference

2000

Theme: Globalization—Deregulation—Delivering to the Customer

The globalization of the power industry occurs at a rapid pace and affects the public and private sectors. Advances in telecommunications, computer technology and information management allow the integration of material and data into a comprehensive strategy to achieve the firm’s global market goals. Challenges in the global arena include global pricing in fluctuating currency markets and control of generation and distribution. Tools available to achieve market goals include computerized control systems, electronic data collection, analysis and interchange, and intranet and internet communications.

This conference program covers the spectrum of technical topics, with an emphasis to quantitative tools and frameworks for analysis needed to address the complexities of our new market. The issues of the future are unclear; by identifying important problem areas, we can stimulate promising applications development.

POWID 2000 Conference Invitation

Dear Society Member:

On behalf of the ISA Power Industry Division (POWID) Executive Board, you are cordially invited to participate in the Annual 43rd POWID and 10th Joint ISA POWID/EPRI Conference, 4–9 June 2000. We will meet at the beautiful new Westin Riverwalk, in San Antonio, Texas, USA. Our colleagues from industry and academia will present nearly fifty technical papers in eight technical sessions, ranging from advanced controls, to the Nuclear Regulatory Commission’s new approach to safety evaluations; from fossil emission monitoring to nuclear setpoints to the aging demographics of the instrumentation and control system engineer—all in the context of deregulation and globalization.

There are six Technical Training Seminars scheduled for 7–9 June 2000, in subjects such as Distributed Control Systems, Boiler Control, and Setpoints for Nuclear Safety Related Instrumentation (SNSRI). These are classes taught by EPRI and ISA, and offered at special conference rates as a service to our attendees.

The Society Awards Luncheon is scheduled for Tuesday, 6 June 2000. Society awards will be presented in recognition of excellence, including best papers, and the Outstanding Achievement, and Distinguished Service Awards.

The Annual Meeting Program can be found in the POWID conference web page: http://www.isa.org/~powid/powid2000_index.htm.

The web page provides listings and abstracts for the Technical Program, Technical Training Seminars, and Standards Committee Meetings. The Registration Forms for the Annual Meeting can be downloaded from the conference web page. Please be sure to read all the instructions for payment of the registration fees, including early registration discount, student discount and cancellation policy. If you have any questions regarding registration, please call or fax the ISA Conference Management Services, (919) 549-8411 or fax (919) 549-8288.

The Technical Training Seminars, coupled with the practical results oriented discussions from the technical sessions, should provide an excellent experience for the POWID instrument and control practitioner and manager alike. The ability to listen to and network with multiple vendor, industry, and regulatory experts who have more and less successfully done what you plan to do, is unmatched.

We look forward to seeing you there.

Sincerely yours,

Marjorie A. Widmeyer
2000 Annual Meeting General Chair
ISA Power Industries Division
### Session Schedule

#### Monday, 5 June – Morning Session

**Keynote Speaker:** Mr. Wes Taylor, Executive Vice President of Generation at TXU Electric

**Economics and Management Session**

*I&C Engineering Services in the Competitive Marketplace*

**Who will you be working for next year at this time?**

**Session Developer:** Robert C. Webb, Senior Consultant, Altran Corp.

**PAPER NO. 1**

“Perspectives from the Nuclear Industry”  
Ted Quinn, Vice President, MDM Engineering

**PAPER NO. 2**

“Collaboration in a Competitive Environment—EPRI’s Perspective”  
Dr. Ramesh Shankar, EPRI

**PAPER NO. 3**

“Smaller Engineering Organizations—Experience in the New Utility Marketplace”  
Doug Spaulding, Vice President, Advanced Concepts Incorporated

**PAPER NO. 4**

“Altran—PG&E Agreement After Two Years—Results”  
John Heffler, I&C Manager, Altran Corporation

**PAPER NO. 5**

“EPC—The Future is Here”  
Dennis A. Huth, Tony DiMartino, Mary Moreton, Vice President, Bechtel Power Corporation

#### Monday, 5 June – Afternoon Session

**Session Developer:** Dr. Robert Smoak, Tennessee Technological University

**Changing Marketplace Session**

*Session Developer: Dr. Robert Smoak, Tennessee Technological University*

**PAPER NO. 1**

“A Simple Transistorized Controlled Four Quadrant Chopper DC Drive”  
Gustavo Enrique Iribarren Aranda, Angelo J.J. Rezek, Carlos Alberto D. Coelho, Jose A. Cortez, and Jose Manuel E. Vicente; Escola Fereral de Engenharia de Itajuba (EFEI), Itajuba, MG — Brazil

**PAPER NO. 2**

“Bypass Control of Sliding Pressure Combined Cycle Power Plants for Today’s Merchant Market”  
William W. Harrison, Senior Systems/Specialty Engineer, Duke Fluor Daniel and Frank Owen, Associate Professor, California Polytechnic State University

**PAPER NO. 3**

“Speed and Load Fuzzy Control for Gas Turbines”  
Marino Sanchez-Parr and Luis Jonathan Bahamaca-Fernandez, Electric Research Institute, Morelos, Mexico

**PAPER NO. 4**

“When Robust Multivariable Control Improves Load Following of a Gas and Fuel Fired Plant”  
Jean-Marc Kson, Clement-Marc Fallinower, Bendotti Pascale, EDF

**PAPER NO. 5**

“Multivariable Steam Temperature Control at Kingston Unit 9”  
Zhuohua Ling, Cyrus Taft, EPRI, and Dr. Robert A. Smoak, Tennessee Technological University

**Improving Performance at Nuclear Power Plants Session**

**Session Developer:** James Snelson, CP&L

**PAPER NO. 1**

“The Need for Uncertainty Calculations—Are We Going Too Far?”  
Thomas Fleischer, Sr. Engineer, Entergy Operations, Inc.

**PAPER NO. 2**

“Experience With Rod Drop and CRDM Testing in Nuclear Power Plants”  
D.D. Beverly, Senior Engineer, and H.M. Hashemian, President, AMS

**PAPER NO. 3**

“Review of Advanced I&C Maintenance Technologies”  
G.W. Morton, Engineer, and H.M. Hashemian, President, AMS

**PAPER NO. 4**

“The Role of I&C Systems in Improving Overall Performance ($/kwh) of Nuclear Plants Entering the Non-Regulated Environment”  
Timothy Hurst, Principal and James Hawkes, Hurst Technologies

**PAPER NO. 5**

“Checklist For Software Reuse”  
Terry W. Jackson, Reactor Engineer, USNRC

**PAPER NO. 6**

“Generic Pre-Qualification of Programmable Logic Controller-Based Platforms for Safety-Related Applications in Nuclear Power Plants”  
Joseph Naser, EPRI
A focal point for visitors from all over the world, the Westin Riverwalk Hotel is located on the rambling San Antonio River. Around every bend, you’ll find breathtaking vistas to explore and enjoy—by foot or from one of the colorful river taxis. The river connects some of the city’s most delightful attractions, including Brackenridge Park, the picturesque Arneson River Theater, historic La Villita, the spectacular Rivercenter complex, plus many charming sidewalk cafes and shops.

San Antonio is a great place to meet your colleagues. But the city also offers a good time for the family. There are over 30 colorful attractions, including Sea World of Texas, Six Flags Fiesta Texas, museums, and fascinating historical sites, including the famous shrine of Texas liberty, the Alamo.
### Tuesday, 6 June — Afternoon Session

#### Energy Technologies Session

**Session Developer:** Tom Stevenson, Principal Engineer, Baltimore Gas and Electric

**PAPER NO. 1**

“Non-linear Control of Water Wall Temperature for Once-through Boiler Start-up”
Xu Cheng, Senior Engineer, Richard W. Kephard, Senior Engineer, and Charles H. Menten, Westinghouse Process Control, Inc.

**PAPER NO. 2**

“Digital Valve Instrumentation in Power Plant Application”
James Homoly, Fisher Controls Int’l Inc

**PAPER NO. 3**

“MPV Combustion Diagnostic and Optimization Systems-Application Experience”
Mark Khesin, PhD, President; Tole Khesin, VP Marketing; Chris Power, Principal Engineer; Lars Anderson, Project Manager, MK Engineering Inc.

**PAPER NO. 4**

“Advances in Fuel Oil and Gas Flow Measurement Technologies for Power Generation”
Robert D. Carrell, National Sales Manager, Hoffer Flow Controls, Inc.

#### A New Approach to Safety Evaluations Session

**Session Developer:** Dr. Ramesh Shankar, EPRI

This is a special interest nuclear session to discuss several topics such as:
- The new version of 10CFR50.59 being prepared by NRC. The session will have NRC discuss the changes, then EPRI or its contractor will discuss the changes made (or to be made) to the licensing guideline, and utility personnel will discuss the impact on them.
- Diversity and defense-in-depth when installing digital systems in response to the position of the NRC that common cause failure must be assumed in digital systems.

### Wednesday, 7 June – Morning Session

#### MANAGEMENT ISSUES AND PRACTICES

**Session Developer:** Dale Gray, Generation Asset Manager, EPRI

**PAPER NO. 1**

“Notes On Group Decision Making”
J. Jekielek, Principal Engineer, Organizational Consultant; M. Koczorowska, MD, Psychiatrist, Toronto, Ontario, Canada

**PAPER NO. 2**

“Latest Trends in Electric Power Production”
H.M. Hashemian, President, AMS

**PAPER NO. 3**

“Field Bus—A New Era in Process Control”
D. Mohan Kumar, Senior Engineer, Fisher-Rosemount India Ltd; B. Sheela Rani, Professor and Head, Department of Electronics and Instrumentation Engineering, Sathyabama Engineering College; and Sashi Rekha Shanmungavelu, Computer Science and Engineering Department, Sathyabama Engineering College, Chennai-India

**PAPER NO. 4**

“Performance Enhancement Solutions/Strategies for Reducing Operating Costs”
John P. Wilson, Application Engineer, Fisher Controls International, Inc.

#### FUTURE ISA/POWID INTERNATIONAL CONFERENCES

ISA POWER INDUSTRY DIVISION:
- Walt Disney World, Orlando, FL—2001
- San Diego, CA—2002

**ISA Expo 2000**
New Orleans
21–24 August 2000
## SP67 Nuclear and SP77 Fossil Power Plant Standards Committee/Subcommittee Meeting Schedule

<table>
<thead>
<tr>
<th>Date/Time</th>
<th>SP#</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Monday, 5 June</strong></td>
<td></td>
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<tr>
<td>8:00 a.m. – 5:00 p.m.</td>
<td>SP67.04</td>
<td>Setpoints for Safety-Related Instrumentation Used in Nuclear Power Plants</td>
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<tr>
<td>1:00 a.m. – 5:00 p.m.</td>
<td>SP67.16, WG1</td>
<td>EMI/RFI Design Requirements</td>
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<td><strong>Tuesday, 6 June</strong></td>
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<tr>
<td>8:00 a.m. – 5:00 p.m.</td>
<td>SP67.06</td>
<td>Performance Monitoring for Nuclear Safety-Related Instrument Channels in Nuclear Power Plants</td>
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<td><strong>Wednesday, 7 June</strong></td>
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<tr>
<td>8:00 a.m. – 12:00 Noon</td>
<td>SP67.16, WG4</td>
<td>Digital System Design Guide</td>
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<tr>
<td>1:00 p.m. – 3:00 p.m.</td>
<td>SP67.16</td>
<td>Safety-Related, Digital-Based System Upgrades at Nuclear Power Plants</td>
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<tr>
<td>3:00 p.m. – 7:00 p.m.</td>
<td>SP67</td>
<td>Nuclear Power Plant Standards</td>
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<tr>
<td>1:00 p.m. – 3:00 p.m.</td>
<td>SP77</td>
<td>Fossil Power Plant Standards</td>
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<tr>
<td>3:00 p.m. – 5:30 p.m.</td>
<td>SP77.81</td>
<td>Continuous Emissions Monitoring Systems (CEMS) and Continuous Opacity Monitoring Systems (COMS)</td>
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<td>3:00 p.m. – 5:30 p.m.</td>
<td>SP77.20</td>
<td>Fossil Simulators Functional Requirements</td>
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<td><strong>Thursday, 8 June</strong></td>
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<tr>
<td>8:00 a.m. – 12:00 Noon</td>
<td>SP77.40</td>
<td>Boiler Controls</td>
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<tr>
<td>SP77.41</td>
<td>Combustion Controls</td>
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<tr>
<td>SP77.42</td>
<td>Feedwater Controls</td>
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<tr>
<td>SP77.43</td>
<td>Unit/Plant Demand Development</td>
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<tr>
<td>1:00 p.m. – 5:00 p.m.</td>
<td>SP77.44</td>
<td>Steam Temperature Controls</td>
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<tr>
<td>SP77.14</td>
<td>Steam Turbine Controls</td>
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</table>

Note: all these Subcommittee meetings will be held consecutively.

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## San Antonio POWID Committee

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## Post Conference Training

<table>
<thead>
<tr>
<th>Training Seminar</th>
<th>Title</th>
<th>Cost* (See Note)</th>
<th>Wednesdays 7 June</th>
<th>Thursday 8 June</th>
<th>Friday 9 June</th>
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<tbody>
<tr>
<td>1</td>
<td>ISA/EPRI-Boilers and Boiler Control (BBC)</td>
<td>$300/ $650</td>
<td>Afternoon Class</td>
<td>Morning Class</td>
<td>Afternoon Class</td>
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<tr>
<td></td>
<td>Instructor: Robert W. Hill, PE</td>
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<tr>
<td></td>
<td>Class Duration: 16 hours</td>
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<td>2</td>
<td>ISA/EPRI-Temperature Measurement (TM)</td>
<td>$75/ $200</td>
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<td>Instructor: Ricky Gotcher</td>
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<td>Class Duration: 4 hours</td>
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<td>3</td>
<td>ISA-Introduction to Model Predictive Control (MPC)</td>
<td>$ 75/ $200</td>
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<td>Class</td>
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<td>Instructor: Adaptive Resources, Inc.</td>
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<td>Class Duration: 4 hours</td>
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<td>4</td>
<td>EPRI-Introduction to Distributed Control Systems (DCS)</td>
<td>$375/ $800</td>
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<td>Class</td>
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<td></td>
<td>Instructor: Cyrus W. Taft, PE, EPRI I&amp;C Center</td>
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<td>Class Duration: 20 hours</td>
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<td>5</td>
<td>ISA-Setpoints for Nuclear Safety-Related Instrumentation (SNSRI)</td>
<td>$225/ $500</td>
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<td>Instructor: SP67.04 Members</td>
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<td>Class Duration: 12 hours</td>
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*Note: Cost with Conference Registration/Cost without Conference Registration. Student or Retiree cost is $25 per Seminar.

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## Control Systems Technician™ (CCST) Exam

**Friday, 9 June • 9:00 a.m. to 1:00 p.m.**

Show your career commitment by becoming a CCST. As a CCST, you can earn credibility in your job performance, gain respect from your managers and peers, and increase your salary and career advancement opportunities. Apply today and join more than 3,000 technicians who are certified CCSTs. Visit www.isa.org/certify/ for more information.

---

**The ISA Standards Library**

This CD-ROM features the complete, up-to-date collection of Standards, Recommended Practices, and Technical Reports, including:

- Symbols, Specification Forms, and General Terminology
- Measurement Devices and Transducers
- Environmental Conditions
- Control Valves
- Digital Fieldbus, and Plant Floor Communications
- Nuclear and Fossil Power Plant Facilities
- Electrical System Safety
- Process System Safety

**System Requirements:**
- Windows 3.x, 95, 98, or NT; 8 MB RAM;
- CD-ROM drive;
- IBM-compatible 486 processor or higher.

**Contents:** One CD-ROM

**ISBN:** RA5310  
**Member:** $636.00  
**List:** $795.00

Order online at www.isa.org or call (919) 549-8288.
The course covers the fundamentals of boilers, utility power plant cycles, and combustion. This is followed by a brief tutorial on control theory, then a detailed discussion of combustion control, feedwater control and steam temperature control. The course is ideal for someone newly assigned to power plant controls, or as a refresher for experienced personnel.

Robert W. Hill, PE is president of Amtech Services, a senior member of ISA, and a long time member of the POWID Executive Committee. He has presented this seminar over 125 times to numerous utility companies. His practical, entertaining teaching system style makes complex control systems understandable and memorable.

In this course the student will be introduced to a practical approach to temperature measurement and control. Each student will receive a hard copy of the presentation. Adaptive Resources received the 1999 ISA President’s Award on 6 October 1999 for the most innovative technology for its Quick Study adaptive process control system software at ISA TECH/1999’s 22-exhibit Innovators Center.

In this course the student will be introduced to a practical approach to temperature measurement and provided with the necessary information and procedures for turning an identified requirement into a specification and then into a functional measurement. The course introduces heat transfer considerations, types of sensors, selection, and applications.

In this course the student will be introduced to a multitude of advanced control systems on the market today. The model predictive controller and its application will be discussed in detail. Model generation on-line without bump test and “off-line” from process data will be covered. The created models will be reviewed. The course will cover how to implement a model predictive controller, including how to set up the interface (DDE or OPC) with the existing control system. An actual application for a pulverized coal fired boiler will be discussed as well. A SISCO (Single-In-Single-Out) model predictive controller connected to a second order process simulation will illustrate the capabilities of on-line modeling and control. Each student will receive a notebook containing all presentation materials.

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Modern instrumentation technology can help to ensure that critical process parameters are automatically kept within safe limits, even in emergencies. This course discusses ISA methodology documented in ISA-S67.04 Part I and Part II for determining instrument trip setpoints in nuclear power plants. The first part of the course is devoted to management-level overview of the importance of setpoints and the basic concepts and procedures involved in implementing setpoint methodology. The remainder of the course explores the statistical analysis and calculation routines involved in determining setpoints. The course addresses operational issues and potential economic benefits.
ISA Power Industry Division Awards

**ISA Power Industry Division Achievement Award**

This award was created for the purpose of recognizing individuals within the ISA Power Industry Division for outstanding achievement, original design application, or special contributions toward the development of engineering concepts in the field of instrumentation and controls for the advancement of electric power generation.

The Power Industry Division Achievement plaque is sponsored by the Power Industry Division of ISA and is presented at the annual division meeting held in conjunction with the ISA POWID Annual Power Controls & Instrumentation and Controls Conference (June). Each year only one individual is awarded this plaque.

The plaque can be awarded to any person of any nation who is a member of the ISA Power Industry Division and deemed qualified as outlined herein.

An ISA member submits the name of an individual(s) along with a written account of the candidate’s qualifications to the Chairman of the Honors and Awards Committee for consideration. Nominations must be submitted prior to the winter meeting in order to be considered for the May presentation.

Each candidate is reviewed by the Honors and Awards Committee for qualification. Upon committee approval of the candidate, the Division Director polls the Executive Committee by vote at any regularly scheduled meeting. A simple majority of those in attendance constitutes approval to authorize the award of the plaque. For the purpose of this award, three senior ISA members of the Executive Committee, excluding the Honors and Awards Committee members constitute the minimum requirement for approval of a candidate for this award. The Honors and Awards Committee Chairman notifies the successful candidate in writing of the approval and the time and place of presentation. The plaque is awarded at a ceremony during the annual Power Instrumentation Conference.

The recipient of the Division Achievement Award is requested by the Honors and Awards Chairman to select a student to receive a scholarship to a college of his/her choice by the October meeting following the May POWID Achievement Award presentation. If the recipient fails to select a candidate by submitting the student’s name in writing to the Honor and Awards Chairman, the Executive Committee selects a suitable candidate. The dollar amount of the scholarship is determined by the Executive Committee. In addition to the scholarship award, the student recipient is invited to present a paper at a future symposium.

**ISA Power Industry Division Facilities Award**

The Power Industry Division Technology Medal/Award is presented at the annual division meeting held in conjunction with the ISA POWID Annual Power Controls & Instrumentation and Controls Conference held each spring. This award was created in order to recognize outstanding application of innovative control systems and/or instrumentation technology in the production of electric power.

An award shall be presented to the specific facility chosen, and additional individual recognitions may also be presented in a form determined by the Honors and Awards Committee of POWID as deemed appropriate. The presentation shall be made by the POWID ExCom Director to a senior executive, preferably of the corporation operating the facility, at the location of the facility.

**Award Criteria**

1. Innovative application of control system instrumentation technology in the power industry
2. Successful application in a power generation plant (up and running in commercial service)
3. Identified benefits
4. General applicability to the industry
5. Recipient is a facility (power plant, dispatch center, environmental treatment facility, simulator, etc.)
6. International location
7. Applies technology and/or equipment available through use of standard components or practices (i.e., not “one time specials”)

**POWID Service Award**

This is awarded for outstanding service in the field of instrumentation, including the following considerations:

1. The service of the individual is noteworthy, exemplary, or unique (not time-in-grade) and exceeds the normal duties of the office(s) held.
2. The service is of a nature that advances the stature of the division and/or ISA.
3. The service, if within ISA or the division, is of an extraordinary nature beyond the description of the position.
4. The service is of a tangible nature that can be identified for commendation.

The forms are included in this newsletter to encourage all of our members to submit a candidate for each of these awards. We have an annual process for selecting recipients, but I encourage each of you to take this opportunity to nominate an individual or facility as a recipient of one of the awards. Please fill out the forms and return the application to:

Milt Neher  
Honors and Awards Chairman  
ISA Power Industry Division  
Phone: (214) 777-1360  
FAX: (214) 777-1336  
mneher@csw.com
Last issue’s column on control system tuning generated the most response of any column I've written so I thought it appropriate to do another column on the same topic. This time, however, the contents will come from the readers who took the time to send me their own tips and suggestions on control system tuning. I think you will enjoy reading others’ ideas on the esoteric art of control system tuning.

Cyrus,

Thanks for a great article! I always find your articles interesting, but this one covered one of my favorite subjects in process control. Therefore, I hope you don’t mind if I throw in my $ 0.02 on a couple of your tips:

I was surprised by Tip 9. It seems to me that the key to avoiding interaction between upper and lower level loops is to separate the period of oscillation for these loops. In a cascade loop, I think the secondary loop should be at least 2 times faster, and ideally 10 times faster than the primary loop. By not tuning the secondary loop for tight response, it may be necessary to “de-tune” the primary loop to achieve the dynamic separation needed to avoid interaction. The end result could be an upper loop that does not perform as well as it might.

I couldn’t agree more with Tip 8. One of the most common controller tuning mistakes I see is the case of too little gain, and too much integral action (short integral time; high integral rate). If one is “timid” with the gain setting, the only way to “compensate” is to use too much integral action. This results in a “lazy loop” with a slow “reset cycle.” When I talk to customers on the phone with tuning problems, I find that most of them have not tried to determine how much gain the loop will toler-

ate, or to get a “ballpark guess” on the period of the loop (damped or otherwise). No matter what method they are using (trial and error, Ziegler-Nichols, or whatever), it seems that not enough people understand the value of getting a “feel” for the ultimate gain and period of the loop.

Tip 3 is a good one. I confess that I find derivative more troublesome in these days of digital algorithms than I remember in my early analog days. The problem, of course, is that every change in PV the derivative calculation “sees” is a “step change” from one discrete value to another. This causes a derivative “spike” on the output. We offer an adjustable derivative filter on our digital algorithms for this purpose. (Of course all vendors will have a derivative filter, but I don’t know how many have adjustable ones.) We call it Derivative Gain (DG), and our algorithm is such that the derivative filter time constant is D/DG where D is the derivative time. Our default value for DG is 10.0, and it can be set as low as 1.0 to increase the derivative filter time constant. This limits the magnitude of the “spike,” but it also limits the amount of phase lead provided by the derivative action. I also suggest that the derivative time be set no higher than one-fourth the integral time (this is the same ratio suggested by Ziegler-Nichols).

I would add only one thing to Tip 1, and you certainly implied it: I always record the tuning parameters that I find before I touch the controller. That way I can always go “home again” with the adage: “first, do no harm!”

Regards,
Dick Morris
Moore Process Automation Solutions
Spring House, PA 19477
Phone: (215) 646-7400 ext. 2336
FAX: (215) 283-2802
rlm@moore-solutions.com

Mr. Taft,

I read with interest your “List.” Attached is mine. Our company does training and service in process optimization (tuning and control strategies) for PID controller and advance control. One of the problems we identify in plants is to tune (or use complex control strategies or advance control) using equipment in bad shape. Hence, we insist on verify first, tune after. Also, we prefer a properly tuned basic PID loop to complex systems not properly tuned. A lot of vendors claim to have a better algorithm than the PID; sometimes it is true in certain situations. But, generally, if we compare an FPID (f for filter) to those strange algos, usually the PID is a very good choice.

Best Regards!
Michel Ruel, PE
TOP Control Inc.
1635, Rive-Sud
St-Romuald,
Qc G6W 5M6 Quebec, Canada
555 Route 78
Swanton, Vermont 05488 USA
Phone: (877) 867-6473 (toll free)
Phone: (418) 834-4321
Cell: (418) 569-8543
Fax: (418) 834-2651
Internet: mruel@topcontrol.com
Web site: www.topcontrol.com

TOP Control Optimization List:
1. Understand the process
2. Work in cooperation with the operators, explain your work
3. A loop is rarely alone, most loops must work in harmony; when you optimize a process, you are the conductor; you must decide which loops will be slow, which will be fast, when you need tight control,…
4. There is no unique method to tune loops.
5. Simple PID control should be your first choice. If not enough performance, use a more complex control strategy: cascade, feedforward, override,…
6. Check your process before tuning
   • hysteresis, backlash
   • stiction

continued on page 12
POWID Achievement Award Application Form

Applicant’s Name: _______________________________________________

Brief Employment History: _________________________________________

________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
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________________________________________________________________
________________________________________________________________

Describe Contribution in Electric Power Generation I&C

☐ Original Design Application
☐ Outstanding Achievement
☐ Development of Innovative Engineering Concept

________________________________________________________________
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________________________________________________________________
________________________________________________________________
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________________________________________________________________
________________________________________________________________
________________________________________________________________

Submitted By: __________________________________________ Date: ___________________________
continued from page 10

- process gain
- linearity
- varying model
- asymmetry
- noise, hidden cycling
- interaction

7. Tuning is a compromise between
- speed and robustness
- performance and stability

8. Use modern tools to analyze the process (point 6), to select performance criterion (point 7) and predict
- valve wear
- performance
- robustness
- speed of response
- overshoot

9. To improve performances
- A small filter will reduce the useless valve movements.
- Some loops will benefit from derivative, if used it will improve stability, increase performance and improve robustness.
- Often, a characterizer should be used to improve linearity.

10. Tune fast loops first, then slower loops.
- The loops not being tuned should be in manual mode.
- Each time a loop is tuned, leave that loop in auto when tuning the next one.
- The response time between interacting loops should be different (factor of 3 to 5).

END: Verify your work and if possible ask the operator to produce large disturbances. Write a short report. The loop should not be re-tuned until the process is modified or the equipment is replaced or wearing out.

I hope you have enjoyed these articles on control system tuning because next time I will pick a new subject. Who knows what it will be, but I will think of something. As always, I welcome all comments and suggestions. You can reach me by any of the usual methods. Note that my area code is changing again from 423 to 865 (VOL). I wonder how they came up with that one!!

Cyrus W. Taft, PE, Chief Engineer
EPRI I&C Center, 714 Swan Pond Road
Harriman, TN 37748
Phone: (865) 717-2017
Fax: (865) 717-2020
E-mail: cwtaft@compuserve.com
Facilities Award Nomination Form

Facility Name: ____________________________________________

Location: ______________________________________________________________________________________________________

Description of facility: ____________________________________________________________________________________________

What is innovative about it? _______________________________________________________________________________________

What was learned? ________________________________________________________________________________________________

What are benefits to facility, to ISA/POWID? _______________________________________________________________________

What are expected benefits to the Industry? _________________________________________________________________________

Who to contact at the facility for more information? __________________________________________________________________

Name, address, and phone number of nominator: _____________________________________________________________________

Key Project Dates: Start: ___________________________________________ Installation: ________________________________
    Test Period: ________________________________________ In-Service: ____________________________

Major contributors: _______________________________________________________________________________________________

Other awards received by the facility: _______________________________________________________________________________
Globalization, Deregulation, Delivering to the Customer—Measurement and Control Challenges and Solutions for the Power Industry in the New Millennium

Early Registration Deadline: 8 May 2000
POWID Newsletter

POWID Service Award Application Form

Applicant’s Name: ____________________________________________________________

Brief History—POWID Division Activities: ______________________________________

__________________________________________________________________________

__________________________________________________________________________

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Describe Contribution to POWID Division: ______________________________________

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Submitted By: ____________________________ Date: _______________________________
POVID ExCom Meeting—October 1999

The 125th meeting of the ISA POWID Executive Committee was held on 4 October 1999 in Philadelphia, PA, in conjunction with ISA TECH/1999.

Attendance:

<table>
<thead>
<tr>
<th>Members Attended</th>
<th>Members Absent</th>
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<tbody>
<tr>
<td>J. Batug</td>
<td>D. Antonellis</td>
</tr>
<tr>
<td>G. Cohee</td>
<td>D. Christopher</td>
</tr>
<tr>
<td>R. Hicks</td>
<td>C. Crow</td>
</tr>
<tr>
<td>W. Holland</td>
<td>R. Hill</td>
</tr>
<tr>
<td>B. Hubby</td>
<td>D. Evely</td>
</tr>
<tr>
<td>R. Hull</td>
<td>R. Johnson</td>
</tr>
<tr>
<td>D. Lee</td>
<td>J. Makanski</td>
</tr>
<tr>
<td>D. Labbe</td>
<td>M. Neher</td>
</tr>
<tr>
<td>G. McFarland</td>
<td>D. Roney</td>
</tr>
<tr>
<td>R. Neustadter</td>
<td>R. Smoak</td>
</tr>
<tr>
<td>M. Skoncy</td>
<td>H. Sternberg</td>
</tr>
<tr>
<td>T. Stevenson</td>
<td>C. Taft</td>
</tr>
<tr>
<td>R. Szczerbicki</td>
<td>J. Weiss</td>
</tr>
<tr>
<td>R. Webb</td>
<td>M. Widmeyer</td>
</tr>
<tr>
<td></td>
<td>H.R. Wiegle</td>
</tr>
<tr>
<td></td>
<td>J. Vavrek</td>
</tr>
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Others Present
R. McSpadden

Honors and Awards—Milt Neher
No Report.

Newsletter—Dan Antonellis
No Report.

Publicity—Joe Vavrek
Report Submitted.

Membership—Danny Crow
No Report.

Editorial Review—Harold Sternberg
No Report.

Historian—Bob Webb
Needs to get the POWID records from Harold Hopkins, previous POWID Historian.

Nominating—Roger Hull
POVID still has five (5) positions open on the board. Utility representation is needed.

Long Range Planning—Ron Hicks
The Long-Range Planning Committee met on 3 October. Ron Hicks reported the following:

- 2002 San Diego POWID Conference
  There is no decision on the 2002 hotel at this time, but the committee is expected to have a recommendation at the next meeting.
- Other Items
  Suggested a Vendors’ Day at the conferences for discussion of systems and for new product releases. Suggested having a management track at the conferences to attract company management.

Web Page—Gary Cohee
- The POWID Home page now has links to Standards and Practices sites, Minutes of Meetings, and the 2000 and 2001 Conferences. Papers from the June Conferences will be put on the web site.
- The number of “hits” went down during the summer.
- The POWID link was removed from POWER Magazine’s home page; Gary will try to get it restored.

Professional Development—Tom Stevenson
Tom reported on CEU credit procedures for professional development that might be applied to POWID Conferences:

- Tracking CEUs would be a time consuming task. If we did the CEUs at the POWID Conferences, then we would have to have a sign-in sheet for each session. If we do CEUs for our training sessions, then we would need records on our instructors’ certification. Tom to investigate if
POWID can piggyback on any ISA certification.

7. Old Business

Manual of Operations—Roger Hull
All inputs will be incorporated, and the new revision will be e-mail ready for the next POWID ExCom meeting.

ISA/POWID participation in DOE’s Campaign of Clean, Efficient, and Affordable Energy—Tom Stevenson/Gordon McFarland
- Gordon reported on the progress to date on the ISA POWID participation in the DOE Technology Transfer meeting to be held on 20 October in Germantown, MD. The call for papers has been drafted and mailed out using the ISA mailing lists for the participating ISA Divisions: POWID; Aerospace and Automation; Management; Process Management and Control; Environmental; and Robotics and Expert Systems. Current plans are for 5 papers in the morning, poster sessions and tabletop exhibits during the lunch break, and a panel discussion during the afternoon. The core committee of
- Dr. Sam Biondo of DOE Fossil Energy, Goray Mookerjee of DOE, and Gordon McFarland of ISA POWID are soliciting attendance by major utilities, major control vendors, educational institutions, government agencies, and major engineering firms.

8. New Business
Roger Hull advised that POWID would receive the division award for the second year in a row.

9. ISA/POWID Conferences

St. Petersburg—14–17 June 1999—Don Christopher/Bob Szczerbicki
Bob reported that the CD distributed at the conference had fewer papers on it than the number of papers that were advertised to be on the CD. Only 19 out of 26 papers were included. Last year’s papers that were missed in the proceedings were not included on the CD. Everything else on the conference was positive. Items from the wrap-up were: 1) pre-load the PC used with the projector to save time and confusion; and, 2) hand out the evaluations forms early and then collect them right after the session. The paid registration was 157.

San Antonio—June 2000—Marge Widmeyer/Rudy Neustadter
Marge will e-mail a complete report after the 2000 committee meets. Marge advised that Ramesh Shankar is the EPRI contact for the 2000 Conference, and Rudy Neustadter is the Program Chairman.

Rudy reported that he has 10–17 papers for the nuclear session and that there will be 3–4 fossil sessions. Rudy reported that Danny Crow (Membership Chairman) has contacted several local colleges and felt that he could get some student papers.

Orlando—May 2001—Ron Hicks
Ron advised that no hotel contract has been signed yet. Mike Skoncey advised that Reedy Creek Utilities could do a tour of their plant and SCADA system, plus get an under-the-city tour. Mike is also looking for a keynote speaker from one of the people responsible for the animation at Disney World.

San Diego June 2002—Open

10. ISA TECH/EXPO Conferences

Rudy advised that no POWID papers from our past conferences were used at this year’s ISA TECH Conference. Bob advised that we need to get a person on the theme committee to get our POWID papers included.

ISA EXPO/2000—New Orleans: 21–24 August 2000—Roger Hull asked for volunteers for steering committee. The following volunteered:
- Networks—Bob Hubby
- Emerging Technologies—Gary Cohee
- Safety and Environmental—Mike Skoncey* 
- Automation and Control—Dan Lee
- Planetary and Keynote—Marge Widmeyer
- Productivity and Flexibility—Tom Stevenson
- Management Issues—Open

*Mike will see if he can make the Summer Meeting; if he can, he will be on the Steering Committee.

11. Next Executive Committee Meeting
The next POWID Board meeting will be Monday, 17 January 2000, 1:00 p.m.–4:00 p.m. at the Hotel Vancouver, Vancouver, B.C. during the ISA President’s Winter Meeting. Roger Hull asked for a Long Range Planning meeting, and Honors and Awards meeting, a 2000 Conference meeting, and a 2001 Conference meeting to be held on Saturday, 15 January.

12. Adjournment
The meeting was adjourned at 3:50 p.m.
The ISA Power Industry Division’s Spring Conference is a rich source of quality information captured in the numerous technical papers that are presented. Each paper receives a rigorous review by three industry specialists before it is accepted for presentation and publication at the conference. Each year the authors of the top three papers receive an honorarium, and the papers are selected for publication in the POWID newsletter.

We are pleased to include the second 1998 best paper “Control System Performance Before and After” by Brent Studnicka and Ernest Caple in this issue of What's Watt for your reading pleasure. The third of the 1998 best papers will be published in the Spring 2000 POWID newsletter.
## Power Industry Division Officers

<table>
<thead>
<tr>
<th>Role</th>
<th>Name</th>
<th>Address</th>
<th>Phone</th>
</tr>
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<tbody>
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