Greetings Power Industry Division Members,

The Power Industry Division has been hard at work in 2014. Here are a few of the accomplishments thus far:

• We completed a productive meeting in Research Triangle Park at the ISA Headquarters in February.

• We completed a productive meeting in Scottsdale, Arizona prior to the POWID Symposium event this past June.

• We executed our 57th POWID Symposium in Scottsdale, Arizona this past June.

• In all, 85 papers were submitted for the POWID Symposium, and 70 presentation files were issued.


Although a little has been summarized above with respect to the 2014 ISA POWID Symposium in Scottsdale, it never seems that there is enough article space to say enough about the volunteers that support the event. This year, the POWID Symposium team consisted of Aaron Hussey, Neva Espinoza, Susan Maley, Bob Queenan, Xinxheng Lou, Terri Graham, Mike Skoncey, Jason Makansi, Cyrus Taft, Tom Stevenson, Seth Olsen, and—last, but not least—Rodney Jones. This year’s POWID Symposium team encountered some challenges during the development phase. The overall ISA web site system was updated just prior to the release of registration for the event—and there were some integration difficulties that led to some confusion. Additionally, there were some last minute cancellations with respect to presenters, speakers, and exhibitors. However, overall, this year’s POWID Symposium team put together a great program that attracted strong attendance numbers. Two key takeaways that seemed to be a big hit at this year’s POWID Symposium:

• The opening (keynote) session benefitted from having a group activity following the keynote address. This year, this was an ad hoc session of “Scientific Jeopardy” that was developed by Aaron Hussey due to the late-breaking cancelation of one of the keynote speakers. The participants formed groups and answered questions associated with the exhibiting vendors as well as general scientific knowledge-based questions. The winning group received drink tickets as their reward. Although the type of activity should be “changed up” from year to year, it is easy to say that future ISA POWID Symposia will benefit from following this format change.

• The participation of university students at the event, as symposium helpers as well as presenters, was a big hit. As I spoke with several in attendance, the exhibitors, as well as the Executive Committee members, the common thread response was that it was impressive to see the students prepared to present on the topics that they chose. It was also stated several times that the students are the future of our industry—as such, the 2015 ISA POWID Symposium should also benefit from student participation.

In addition to what “is behind us” in 2014, the POWID Executive Committee has been hard at work to identify the locations for upcoming POWID Symposia.

In 2015, the site location is the Kansas City Downtown Marriott. This location is near the KCP&L Power & Light District, Crown Center Plaza, and the Sprint Center. Within short driving distance, participants (or their families) can also enjoy the Kansas City Speedway, the Legends shopping/dining area, the Overland Park area shops and restaurants, KC Royals MLB, KC T-Bones baseball, and… Kansas City Bar-B-Q! Be sure to mark your calendars for the first two weeks in June for 2015—the 58th annual ISA POWID Symposium is one that you won’t want to miss!

In 2016, the site location is being investigated. The general region of the POWID Symposia will be the East. The three cities that are being investigated include Arlington, Charleston, and Charlotte.

Continued on page 2
As some of you may recall, a very successful POWID event was hosted in Charlotte just a few years ago—and the other two locations should offer some attractive destination opportunities for the participants (and their families) as well.

In closing, a lot of activity has taken place so far in 2014. As always, the ISA Power Industry Division encourages the participation of its members. This participation can be as simple as attending the POWID Symposium to gain more knowledge that is applicable to the Power Industry; but, those that may be interested in leadership, writing papers, developing presentations, or helping with the planning/execution of a POWID Symposium are also encouraged to get involved.

If you have any comments or suggestions for the improvement of the ISA Power Industry Division, please feel free to contact me directly at parkerbs@bv.com or brandonparker1973@gmail.com.

Best Regards,
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Upcoming POWID International Conferences

58th Annual ISA POWID Symposium
Kansas City Downtown Marriott, Kansas City, Missouri USA
7–12 June 2015 (tentative dates and location)

You can find information on other ISA Events at www.isa.org/events.
Photos from POWID Symposium 2014

Photos by Joseph Vavrek
ISA POWID Executive Committee (EXCOM) member
2014 Symposium Publicity Director

ISA POWID EXCOM Meeting (clockwise from left to right): Bill Sotos, Bob Queenan, Tim Hurst, David Roney, Roger Hull, Mike Skoncey, Danny Crow, Aaron Hussey, Don Labbe, Cyrus Taft, Dan Lee, Alan Zadiraka, Brandon Parker, and Seth Olson.

(left) Hilton Scottsdale Resort & Villas; (right) Outdoor seating in the morning
Dr. Romanosky, the keynote speaker and one of the panelists, is currently the Deputy Director, Office of Coal and Power R&D at the National Energy Technology Laboratory. The Office of Coal and Power R&D has responsibility for the Carbon Capture, Gasification, Turbine, Fuel Cell, Carbon Storage, Crosscutting, and Advanced Combustion Programs. Dr. Robert Romanosky received both his M.S. and Ph.D. from West Virginia University in analytical chemistry/instrumentation. He has been with the U.S. Department of Energy, National Energy Technology Laboratory, since 1978, spending 18 years working in areas involved in all aspects of both laboratory and process research dealing with advanced instrumentation and process analysis on power systems. For the next 17 years, Dr. Romanosky was the Technology Manager for Power Systems Advanced Crosscutting Research. This technology area encompasses research activities in Advanced Materials, Plant Optimization Technologies, Advanced Systems Modeling, Coal Utilization Sciences, and University Training and Research. Plant Optimization Technologies supports the development of novel sensors and control systems critical to the implementation and optimization of advanced fossil fuel-based power generation systems, including new classes of sensors capable of monitoring key parameters (temperature, pressure, and gases) while operating in harsh environments.
Mr. Staples is Senior Manager of the Utility Operational Compliance organization at Oklahoma Gas & Electric (OG&E). He began his career with Oklahoma Gas & Electric in 1978 at the company’s Horseshoe Lake Power Plant. Since that time, he has worked in the areas of automation, analysis, testing, natural gas measurement, predictive maintenance, compliance, and has provided consulting services to external customers. A Fellow in the International Society of Automation (ISA), Leo has authored and delivered technical and leadership papers at various ISA events around the world (including POWID). His first book, “Project Management: A Technician’s Guide” was published by ISA in March 2010. Leo served as ISA Society President in 2011.

Jeff Williams is the Business Development Manager for Ovation model-based applications and optimization solutions for Emerson. He has over 30 years of experience in the automation industry. His endeavors are centered on creating applications that help solve customer problems with advanced control technology. Consulting with customers in developing new applications is a primary objective of Jeff’s work. He began his career in 1981 as a Westinghouse field engineer starting up first generation DCS systems. Jeff then moved on to a position with Merck as the Co-generation Supervisor for their newly constructed combined cycle plant. When the plant transitioned from design-build, to operate-maintain, Jeff then re-joined Westinghouse Process Control as a Project Manager for the Power Plant Automation Projects department. Later along the career path, Jeff was added to the Product Marketing group prior to the Ovation product launch. The ideas for developing advanced applications that would benefit the industry need for improved environmental stewardship and more efficient operation led to the creation of the SmartProcess application portfolio. Recently Jeff is working to embed the advanced control and optimization technology into the DCS level architecture to leverage the advances in computational power. These solutions and services augment Emerson’s efforts to be the power industry’s leading automation solution provider. Jeff is a graduate of the Ohio Institute of Technology. Jeff was honored by the ISA Power Industry Division with the 2005 Achievement award, and most recently was elevated to Fellow by the International Society of Automation.
Student Presenters from the University of Texas at El Paso.

Back row (standing) from left to right: Gerardo Rodriguez-Melo, Satya Gullapalli, Mohammad Shojib Hossain, Diego Delfin, Md Rashedul Sarker.

Front row from left to right: Ricardo Martinez Hernandez, Luz Irene Bugarin, Brittney Brown, Jose A. Gonzalez. Photo by Paula Labbe.
Gold & Silver Champions

Gold: POWER magazine, Schneider-Electric, Siemens and Emerson

Silver: CASE MBI, Beamex, EXCEL, GE, Honeywell, HURST Technologies and Rockwell Automation

Photos by Paula Labbe
Hi Everyone,

The 2014 ISA POWID Symposium was held in Scottsdale, Arizona this year. The Scottsdale Hyatt is a beautiful hotel centrally located near many attractions including “Old Town” the historic district, many shops, and incredibly diverse restaurants. I guess you could say there was something for everyone in this amazing location!

The hotel pool felt like our own private island, complete with flowering plants, palm trees, and a hot tub, in the middle of the desert. There were plenty of lounge chairs and umbrellas for all. It was the perfect place to relax, and enjoy a refreshing swim after a busy afternoon.

This year the Spouses were treated to a “Villa” where we could meet, enjoy breakfast together, and discuss our plans for the day. Every morning we congregated at the pool, and walked together to the Villa, which was about five minutes away. As we strolled along we saw an unusual looking bird, at least it was unusual to me. I never saw a bird quite like this before. It looked proud and as if it were wearing a stylish feather hat. Later, a postcard revealed that the mystery bird was called a Gambel’s Quail, which seem to be abundant in this area. As we continued on our way, we passed more beautiful flowers, a few cacti, and a small peaceful waterfall. It didn’t take long before we were at the villa. It was early in the morning, and as we opened the door the smell of coffee greeted us! The kitchen was set up for breakfast. We were treated to colorful fresh fruit arranged on sticks, with a fresh pineapple as the centerpiece, yogurt, and hot cinnamon buns!!! The villa had a large conference table which came in handy as we gathered around it. The villa was a fully decorated apartment. We also had a private patio, which was landscaped in traditional southwest fashion. The villa created the perfect setting to reconnect, catch up on the happenings over the past year, and to plan our adventure for that day.

It is very hot in Arizona this time of the year, as you know, so our exploring had to be done in the morning and early afternoon. Usually, the afternoons were spent by the pool, where the water provided relief from the 110 to 112 degree temperatures. Of course that is “Dry Heat”. We decided to explore Old Town, since it was close by, and an easy jaunt.

The town was full of unusual, interesting, shops. There was everything from southwest jewelry, to art galleries with names like “The Lazy Lizard”. They even had an interesting saloon in town, complete with the most unusual bar stools I ever saw!! The stools looked like ladies wearing red hot pants, fish net stockings, and cowboy boots!!! It was even funnier when you saw big, burly, men sitting on these amusing stools. The name of this saloon was “The Rusty Spur” and its walls were full of license plates, and photos of famous people who frequented this establishment. Their menu offered such specialties as rattlesnake eggs, buzzard wings, spur burgers, tumbleweed salad, and landslide nachos. I noticed one area on the wall with dollars bills tacked to it. I was told that patrons commemorate their visit by placing a dollar on the wall, and every year just before Christmas, the money is donated to the Phoenix Children’s Hospital. After I heard that, I gave a thumbs up to the Rusty Spur Saloon, with their funny bar stools!!!

Time passes so quickly when you are having fun, and the heat was a reminder that it was time to return to the hotel. No matter where we go, or what we do, we always enjoy our adventures together. All spouses are welcomed. We come from many different areas, but there are no strangers. I have made many lasting friendships through ISA, and I treasure all of them. Until we meet again next year, I wish you the very best.

ISA POWID Symposium 2014—A Spouse’s Point of View
By: Paula M. Labbe
ISA POWID 2014 Awards Luncheon Summary

By Mike Skoncey
Photos by Joseph Vavrek

The following is a listing of the awards that were presented during the annual ISA POWID Awards Luncheon during the 2014 ISA POWID Symposium:

The 2014 Achievement Award went to Dr. Joseph Bentsman.

The 2014 Facilities Award went to Alstom’s 3 MWth Chemical Looping Combustion Test Facility.

The Robert N. Hubby Scholarship was awarded to Breanna Bancheri from Rutgers University.

There were NO nominations submitted for the 2014 Service Award so that award was not given.

The Technical Paper Awards given for papers from the 2013 POWID Symposium were as follows:

**Best Paper**
Operator Training Simulator for Power Plant Combustion Optimization System Design
Written by Don Labbe, Marlina Lukman, Robert McHugh of Invensys

**2nd Best Paper**
Evolution of Electromagnetic Environment Site Surveys to Support Plant Upgrades
Written by Chad Kiger of Analysis and Measurement Services Corporation

**3rd Best Paper**
Developing EMI Testing & Immunity Strategies for the Replacement of the Palo Verde Nuclear Generating Station Diesel Generator Automatic Voltage Regulators
Written by Christopher Noack of Palo Verde Nuclear Generating Station

The Awards Luncheon Speaker was City of Scottsdale, Arizona Mayor W.J. “Jim” Lane.
(top left) Mayor W.J. “Jim” Lane giving luncheon speech; (top right) plaque for Mayor Lane; (bottom) lunch buffet  Photos by Joseph Vavrek

Lunch conversation  Photo by Joseph Vavrek
Newsletter Editor Update

By Dale Evely, P.E.
Southern Company
ISA POWID Newsletter Editor

The goal that POWID works toward is to publish three newsletters each calendar year; with the basic schedule being publication in March (Spring), August (Summer) and December (Fall). All three of the newsletters are published electronically and the Spring newsletter is also published in paper format and mailed to those of you who live in the USA.

Most of you either did not receive your paper copy of the Spring 2014 newsletter this past April or you received it at your address with someone else’s name on it. Rodney Jones, our ISA Senior Administrator, has had this investigated and determined that this mailing list mix-up was a result of ISA’s data transition from one list management software system to another. ISA assures us that this was a rare occurrence and is not likely to happen again. I would like to apologize to you on behalf of ISA for you not receiving your paper copy of the newsletter; if you are reading this you most likely did receive your electronic copy of it and it is also available on the ISA POWID portion of the website.

Since the newsletter is only as good as its content, I would like to encourage each of you to submit technical articles as well as other articles of broad interest for publication in future newsletters. Technical content that is specific to the automation side of the power industry is what provides the best benefit to our membership so please share with your colleagues any tidbits that have been beneficial to you in your job or in expanding your knowledge base. You can send your articles to dpevely@southernco.com (please limit any attachments to 5MB or my mail server may not let them through and I will never know that you tried to send them). If you e-mail an article and do not get a thank you response from me it may not have gone through. If the article was not authored by you, please provide us with a statement that you have cleared publication of the material with the author. I look forward to hearing from you.
POWID Awards Nomination Request to All POWID Members

You can tell from the quality of the presentations at our POWID Symposium and the discussions between attendees that a lot of talent resides in ISA’s Power Industry Division (POWID). There are many individuals that display their talents in “beyond the norm” fashion. During your busy days, when such an individual is identified, recognize them by nominating that person, or an exemplary Power Facility for a POWID award as listed below:

- POWID Achievement Award
- POWID Service Award
- POWID Facilities Award
- Robert N. Hubby Scholarship

Nomination forms for these POWID awards are currently not available through the POWID website so they are included in this newsletter as file attachments at the end of this article. Nominations for POWID Awards and Applications for the Hubby Scholarship are due by January 30, 2015.

Do not forget there are also ISA Celebrating Excellence awards that many POWID members are well deserving of. Information on those awards and how to submit nominations for them can be found at: http://www.isa.org/members-corner/isa-honors-and-awards/.
“Instrumentation & Control Solutions for Today’s Industry Challenges”

The 58th Annual ISA POWID Symposium will be held in Kansas City, Missouri, 7-11 June, 2015 at the Kansas City Marriott. The POWID Symposium is the largest conference dedicated to automation, control systems and instrumentation in the power generation industry. The Symposium Program Committee is soliciting abstracts for full papers and for presentations. All paper submissions will be peer reviewed to ensure high quality and originality. Symposium Proceedings will be published on CD for distribution to attendees and also made available on the ISA web site. Suggested topics for submissions include:

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For more information on the 2015 ISA POWID Symposium and to submit an abstract, please go to [www.isa.org/powersymp](http://www.isa.org/powersymp) or contact:

**POWID Division Director, Denny Younie** dyounie@casemi.com
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**ISA Staff Contact- Rodney Jones, rjones@isa.org**
**Exhibit and Sponsorship Sales – Carol Schafer, cshafer@isa.org**

**Submissions due January 19, 2015.**
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Promote your products and services to a very specific, focused readership of power industry instrumentation and control engineers and managers by advertising in this newsletter. Advertisements will run for 3 consecutive issues (typically March, August and December) based on the payment schedule below.

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Power Magazine Updates its Industrial Network Security Book

Power Magazine has released the second edition of its book *Industrial Network Security*.

This 130 page book introduces managers, engineers, technicians, and operators on how to keep our industrial networks secure amid rising threats from hackers, disgruntled employees, and even cyberterrorists.

You just need to read the newspaper headlines to appreciate the importance of Industrial Network Security. Almost daily an article comes out describing the threat to our critical infrastructure, from spies in our electrical grid to the looming threat of cyberwar.

Whether we talk about process control systems that run chemical plants and refineries, supervisory control and data acquisition (SCADA) systems for utilities, or factory automation systems for discrete manufacturing, the backbone of our nation’s critical infrastructure consists of these industrial networks and is dependent on their continued operation.

The book is priced at $169 and can be purchased on-line at: store.powermag.com and isa.org.

Comprehensive Industry Level Review of Fleet-Wide M&D Centers

Over the last decade, many utilities and independent/merchant power producers have installed fleet-wide monitoring and diagnostics (M&D) centers. Each has a veritable suite of software applications from different vendors, but the two “anchor tenants” are thermal performance monitoring and advanced pattern recognition (APR) to calculate plant efficiency and detect equipment anomalies and deviations. The art and practice of M&D center design and operation is poised for even greater expansion, thanks to breathtaking growth and declining cost of backbone digital chip technology, cloud computing, wireless sensors, mobile and hand-held digital devices, robust algorithms, and 3-D visualization technology. A report, available as a reprint from Combined Cycle Journal, offers close-up views of M&D center operations at several utilities, and captures trends among a dozen or so of the pioneering and recently installed facilities.

Consultant Jason Makansi, author of the report and long-time POWID Executive Committee member, synthesizes his generic experiences with several different software platforms and their applications. The M&D center, he notes, is part of a broader movement towards a complete “digital” power plant that accompanies the physical plant. He argues that owner/operators and developers need to issue design specifications for this digital plant in the same way a design spec is developed and issued for the physical hardware. Hard copies of the report are available by request (include a mailing address) to jmakansi@pearlstreetinc.com.

The Third Best Paper from the 2013 ISA POWID Symposium

During the Honors and Awards Luncheon in June 2014, the Third Best Paper Award for the 2013 POWID Conference in Orlando, Florida was presented to Christopher Noack of Palo Verde Nuclear Generating Station for the paper entitled “Developing EMI Testing & Immunity Strategies for the Replacement of the Palo Verde Nuclear Generating Station Diesel Generator Automatic Voltage Regulators”. This technical paper is provided in its entirety in this newsletter for your reading pleasure. It starts on the next page.
Developing EMI Testing and Immunity Strategies for the replacement of the Palo Verde Nuclear Generating Station Diesel Generator Automatic Voltage Regulators

Christopher Michael Noack, Control Systems P.E.
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KEYWORDS

Voltage regulator, mapping, EMC, EMI/RFI, electromagnetic, nuclear, Palo Verde, testing, diesel generator

ABSTRACT

With nuclear plants starting to modify critical components that support plant operations, Electromagnetic Compatibility (EMC) is a key factor in determining what equipment can be designed, purchased, and installed. But when the first round of testing fails for the automatic voltage regulators (AVRs) that support the emergency diesel generators at Palo Verde, the nation’s largest nuclear power plant, how does the design team provide station management with the confidence to proceed with a modification on this obsolete/aging equipment?

This paper will discuss the multi-tiered approach to identifying the specific emission and susceptibility characteristics for the existing AVRs by performing plant mapping, mimicking the physical plant layout for the EMC qualification testing, hardening the equipment against internal and external interference, and aligning with industry standards and guidelines in order to meet the EMC requirements for safety-related equipment for nuclear power plants. As a result of this approach, and working closely with industry peers in the development of the mapping, testing, and design of the new
AVRs the equipment successfully passed the full range of EMI/RFI testing and will be ready for installation in the near future.

This discussion highlights several additional avenues for addressing more complicated EMC issues for important structures, systems, and components in nuclear facilities while also providing the station with the confidence to precede with potential high-risk design changes using these relatively new testing requirements.

1. INTRODUCTION

As many people who deal with this topic can attest to, Electromagnetic and Radio Frequency Interference testing can be considered by others as either black magic, or a necessary evil as part of a design change or modification for installing equipment in their facility, and Palo Verde Nuclear Generating Station (PVNGS) is no exception. However, unlike similar testing that is conducted for Seismic validation or Factory Acceptance Testing to ensure the devices are performing as designed, it’s sometimes difficult for others to see the immediate value or results of successful, or in this case of this paper, unsuccessful testing of the equipment that is expected to be installed in the near future. Regardless of what industry the EMC engineer is working in, when such failures occur, questions such as “what went wrong”, “how can it be fixed”, and naturally “what are we going to do to ensure this doesn’t occur again” need to be answered both to keep the project progressing and also to ensure that the Electromagnetic Compatibility issues are addressed and understood to prevent similar issues next time they may be encountered. While the topics discussed in this paper are specific for Palo Verde and the Auto Voltage Regulator panels being designed for the plant, the methods and options for complying with industry standards will potentially be applicable for many different devices, locations, and facilities where EMI/RFI are a concern.

2. BACKGROUND AND INITIAL TESTING

The diesel generator system provides a standby source of AC power for the two trains of engineered safety features equipment for safe plant shutdown and decay heat removal under all conditions including the design basis accident in the event of the loss of preferred (off-site) power. Assisting with this function are the automatic voltage regulators (AVRs), which ensure the narrow voltage and frequency bands are maintained during operation of the diesel generators. Due to trending adverse component issues with this portion of the system, a modification was approved to upgrade the AVRs in early 2004. With the exception of utilizing 2 Automatic Voltage Regulators versus 1 Automatic and 1 Manual regulator on the original panel and the upgrade to digital reference units (DRUs) the two panels were equivalent in fit, form, and function – Figure 1.
As part of the original draft of the engineering purchase specification for the new AVR panels for the manufacturer to meet, EMI/RFI requirements were provided which included meeting testing requirements in accordance with MIL-STD-461E and EPRI TR-102323 Revision 2 or 3 for Safety Related equipment. Testing of the panel was conducted in October of 2007 and witnessed by Palo Verde engineers and performed by qualified test engineers at an approved facility. All tests were performed using a freestanding AVR panel with any applicable distance and separation limits required by the MIL-STD met. The following list summarizes the test performed during this period:

- CE101 Low Frequency Conducted Emissions
- CE102 High Frequency Conducted Emissions
- RE102 High Frequency Radiated Emissions
- CS101 Low Frequency Conducted Susceptibility
- CS114 High Frequency Conducted Susceptibility
- RS101 Low Frequency Radiated Susceptibility
- RS103 High Frequency Radiated Susceptibility
With the exception of several frequency ranges during RE102, no other emission limits were exceeded during the testing of the panels. However, during both High Frequency Radiated and Conducted Susceptibility the AVR exhibited fluctuations or either turned completely on or off. No adverse effects to the DRU or other devices on the panel were noted during any of the testing. As a result of this testing, Palo Verde choose to pursue additional hardware design changes and the need to revisit the EMI/RFI testing requirements for the panels that would subsequently move the installation of these devices, which were continuing to challenge the plant, into the Fall 2013 refueling outage; more than 5 years later than originally planned.

3. IDENTIFYING SPECIFIC PLANT NEEDS FOR EMC

Almost three years after the initial testing was completed on the new AVR panels, incorporating lessons learned, an independent review of the modification, and new design requirements as a result of additional component failures on the existing AVR panels in the plant, an update to the PVNGS purchase specification was issued to the manufacturer of the panels outlining additional requirements for EMI/RFI qualification. These included specific EPRI TR-102323 Revision 3 exceptions to certain portions of the testing for MIL-STDs in specific frequency ranges, specifically ensuring that these allowances were valid for the design and would not sacrifice the quality of the testing. These exceptions included:

- Equipment Tested in accordance with MIL-STD-461E (RS103) may be exempted from High Frequency Conducted Susceptibility between 30 and 200 MHz
- Low-Frequency Radiated Susceptibility does not need to be performed as the panel is not located in an area that is in close proximity (less than 1m) to large magnetic fields (>300 A/m).
- High-Frequency Radiated Susceptibility does not need to be performed above 1 GHz, as this is the highest known frequency in the area.
- Surge Test levels are to be performed at +/- 2KVp-p and/or level 3 if using IEC 61000-4-5. The repetition time will be provided by PVNGS Engineering prior to the start of EMC Testing once the energy level has been calculated for the suppression device.
- Electrically Fast Transient (EFT) levels shall be +/- 1KVp-p for all I/O lines via a capacitive clamp.
- Electrostatic Discharge (ESD) test shall not be performed
- Low-Frequency Conducted Emissions may not need to be performed if the Vendor designed equipment meets the power quality requirements contained in EPRI TR-102323 Rev.3. A joint decision between PVNGS Engineering and the selected Vendor of the equipment shall occur prior to the start of EMC Testing.
- High-Frequency Radiated Emissions do not need to be performed above 1 GHz, as this is the highest known frequency in the area.
Along with the items above, it was also required that control wiring was twisted shield pairs (and located on the back of the panel if possible), and include the option to use the IEC testing standards versus the MIL-STD. The specification also called out additional areas where PVNGS knowledgeable EMC engineers provide input to the selection process for the testing site used for any new EMI/RFI testing, reviewing of any testing procedures for the equipment to ensure all aspects were addressed, and providing additional requirements for what is needed in a finalized test report from a test laboratory.

Along with the requirements outlined in the specification, additional discussions with the manufacturer of the new panels and PVNGS engineering took place to better mirror the plant conditions where the panels are located in reference to the diesel generators themselves, which are located to the “Plant South” of the Diesel Generator Control Rooms, inside the local control panels (low voltage side), see Figure 2.

![Diagram of Diesel Generator Control Rooms and local control panels](image)

Figure 2: Diesel Generator Control Rooms and local control panels

As a result of these discussions, and further review of the initial EMI/RFI testing performed, it was noted that the panel was originally tested without any shielding between the equipment under test (EUT) and the associated antennas used during testing. It was agreed upon by both groups that by constructing an enclosure similar to the make and material used at the plant, a better representation of the radiated emissions and susceptibility could be achieved. To further simulate the potential impacts from both sources of interference, reviews of the runs of power and control wiring were documented, and specific wiring for these portions of the panel were identified by Palo Verde, including the approximate run of rigid conduit and communicated to the vendor for use during the next round of testing.
With updates to the purchase specification for more robust EMI/RFI testing criteria, mimicking both the enclosure where the panel is located and cables that interface with the equipment, new testing for the panels was scheduled for late 2011 that included a new testing company and reviews of the initial testing procedure to ensure that all the requirements for meeting the EPRI guideline, specific exceptions, and more robust documentation were meet. The prototype panel, which was originally tested during 2007, was updated to reflect the use of twisted/shield pairs for control wiring and new design requirements from Palo Verde and was placed inside an enclosure as specified by Palo Verde – Figure 3.

Prior to shipping to the testing facility, the manufacturer, looking to obtain some preliminary EMC results with the changes made to the panel, brought an EMC test engineer from the facility that would be conducting the formal test to their shop in order to validate if any of the previous tests that had failed back in 2007 had been resolved with the new design changes. The results of this testing were not encouraging.
4. PLANT MAPPING

Initial testing that was performed by the manufacturer identified two significant findings; that the shielding provided by the cabinet was slightly attenuating the radiated susceptibility at the higher frequencies that were an issue during the original testing, but not enough to fully place the panel in compliance with the EPRI guidelines. Second, conducted susceptibility, which was already identified as an issue during the first round of testing, was still higher than the testing limits allowed. The manufacturer attempted several different filters types (capacitors, filters, and separating of bundles) with no noticeable differences in the results. While this testing was not performed in a qualified testing chamber with all of the protection afforded by such a site, it did identify that several areas were still a concern and raised additional concerns with the Palo Verde design team regarding the overall likelihood of passing the second round of testing without any issues.

Days after receiving the news from the manufacturer about the results of this preliminary testing, several recommendations about how to address these issues were brought up. These ranged from a complete redesign of the panel to provide more robust protection from Emission sources, completely bypassing testing – with the justification that the original AVRs did not have any qualified testing performed on them, and did not show any signs of being affected by plant emissions, and potentially performing baseline mapping of the diesel generator control rooms to get a snapshot of the emissions in and around the AVR cabinet. After discussing the options internally, with the manufacturers of the panels, and the testing laboratory, it was concluded that plant mapping would provide the best approach to determine the actual levels in the plant around the diesel generators and use this data as input for acceptance of any deviations during the qualified testing.

As with the development of the latest version of the purchase specification, EMC engineers at Palo Verde started by specifying specific requirements for the laboratory that would be performing the mapping on site. This included having iNARTE Certification for Engineers / Technicians performing the EMC Plant Mapping. The goal of the mapping was to collect the data during the Site Survey (frequencies / dB levels) and overlay this recorded information against the EMC Testing procedure acceptance criteria for the AVR Panel Insert when performing testing. Palo Verde engineers provided the first draft of the expectations and steps required to perform the mapping. The specific areas of interest for the site survey included static (steady state) mapping of the Diesel Generator AVR control rooms for all (3) Units, and (2) trains per Unit. In addition, dynamic (operating) mapping was scheduled for at least one train with the diesel generator loaded. The testing consisted of performance of Radiated Magnetic Field Measurements (RE101 & RE102) and Conducted Emissions Measurements (CE101 & CE102) with specific holding points should conditions of the plant or operations or maintenance support require that specific testing not be performed. With concurrence from Operations and maintenance crews regarding the approach that
would be used to gather this mapping data, the company for mapping the diesel generator rooms was selected, and dates were set-aside in early March of 2012 for performance of the activity. During the six days that it took to perform the testing for all six trains of Diesel Generator control rooms and one set of test data that included running the diesel as part of a normal operational test, both conducted and radiated emissions data was gathered successfully. As outlined in the original proposal for the mapping, there were no “pass” or “fail” criteria for the mapping, since the intent was to only gather data that was to be used as input to the final qualified testing of the AVR panels for EMC. The findings from the mapping identified that other than @60 Hz, there were no measurements for low frequency conducted emissions (CE101) that were above the EPRI TR-102323 Revision 3 plant composite limits or the Revision 1 allowable plant limits. High frequency conducted emissions (CE102) for the cables that were tested in Unit 2 did not exceed Revision 3 plant composite limits or Revision 1 plant levels; this was the only unit tested due to Operations support concerns. Low frequency radiated emissions (RE101) measurements on the cabinets found no emissions that exceeded Revision 1 allowable plant levels, or either Revision 1 or 3 plant composite or Revision 3 equipment limits for the areas. Finally, the values recorded for high frequency radiated emission (RE102) were found to be above the Revision 3 plant composite limits at several frequencies; however, the emissions never exceeded the more conservative Revision 1 allowable plant levels. With the mapping report finalized by the company, the findings were provided to the testing facility that would be performing the qualified EMI/RFI testing for the AVR panels. Applicable section of the testing procedure were revised with the data obtained from the site survey to provide additional margin and acceptance criteria should the “watch areas” for radiated or conducted susceptibility issue arise during testing.

5. RETESTING

Testing at the laboratory was conducted from April 25th through May 3rd 2012. Two witnesses from Palo Verde were present for the first week of testing, the lead responsible engineer, EMC engineer for the project, and a senior electrical engineer who provided input to the testing criteria and setup for the testing. The testing performed during the two-week period consisted of the following IEC and MIL-STDs; using the approved EMC laboratory testing procedure and the testing standards for configuration, setup and acceptance criteria:

- IEC61000-6-4, Conducted Emissions, Power Leads, 150 kHz-30 MHz
- RE101, Radiated Emissions, Magnetic Field, 30 Hz-100 kHz
- IEC61000-6-4, Radiated Emissions, 30 MHz-1 GHz
- IEC 61000-4-3, Radiated Immunity, 26 MHz-30 MHz, 80 MHz – 1GHz
- IEC 61000-4-4, Fast Transient Burst, Power Leads and Signal I/O cables
- IEC 61000-4-5, Surge Combination Wave, Power Leads
- IEC 61000-4-6, High Frequency Conducted Susceptibility, 150 kHz – 80MHz
- IEC 61000-4-12, Surge Ring Wave Immunity, Power Leads, 100 kHz & 1 MHz
The use of European testing standards was chosen based on the history the laboratory had with these testing criteria in the past, and were reviewed and accepted by Palo Verde EMC engineers as an acceptable method for testing the AVR panels. Prior to the formal testing of the panel, inspections of the changes to the cable shield, cabinet, and AVR panel were made to ensure that the requirements and prerequisites for the testing procedure were meet – Figure 4.
As part of initial discussions for preparation of the testing, it was recommended by Palo Verde engineers that Metal Oxide Varistors (MOVs) or Gas Discharge Tubes (GDTs) should be installed on the 125Vdc, single phase 120Vac and three phase 120Vac since they are treated as power lines because of the connections to power in the installation and to prevent issues with surge testing that would be performed as part of the testing. The only other modification made to the original panel was the addition of an in-line filter for the 125VDC power as a result of conducted emissions.

In order to verify correct operation of the equipment during testing, the AVR was placed in a controlling mode of operation to maintain a stable field voltage at the output terminals, and a lamp was used to provide illumination and voltage monitoring of the output (via an oscilloscope) to verify operation during the testing. Applicable indications of susceptibility to either conducted or radiated sources were noted at specific frequencies, then an attempt was made to repeat the condition to ensure testing was the cause of the interference and corrective actions taken if needed. The following paragraphs summarize the results of the set of test performed, all results were within the allowable limits specified by the testing procedure and accepted by PVNGS, and the manufacturer’s representative after testing was completed.

- Low frequency conducted emission testing was performed using both normal and Quasi-peak measurements after initial testing showed emissions limits above the acceptance criteria. A review of the initial results by the testing laboratory, and PVNGS engineers concluded that an in-line filter would be required to bring the emissions under the acceptable limits for the standard. Once the filter was installed, the emissions recorded were well below the limits and was determined to be acceptable by all parties.
• Radiated emissions to the MIL-STD for RE101 were performed with no areas of concerns noted.
• High Frequency Radiated Emissions testing also found no areas of concerns. As a result of the low readings from this testing it was found by the technicians performing the testing that no noticeable emissions were present beyond 385 MHz
• Radiated Susceptibility, which was noted as an area of concern for the testing, required the use of the plant mapping data to meet the acceptance criteria for the testing versus the full IEC standard limit. No other issues were noted with the performance of the AVR during this test.
• Electrical fast transient/burst testing was completed successfully with no issues noted
• Surge testing was also completed successfully with no issues noted
• Conducted Susceptibility, the other area which was an issue during the original testing and pre-testing with the new standards, also used the plant mapping data to ensure that the limits applied as part of the testing were at or below the requirements in the test procedure. With this level applied, the testing was completed successfully.
• Voltage ring wave immunity was completed with no issues noted

As stated above, with the minor changes to include the MOVs and filters and use of the plant mapping data for meeting acceptance criteria for the Conducted and Radiated susceptibility, testing was completed and accepted by Palo Verde which allowed final manufacturing of the panels, incorporating the design changes made as a result of the EMI/RFI testing.

6. CONCLUSION

It is critical when starting down the path to EM compliance for a new piece of equipment that EMC engineers and knowledgeable team members provide input both to the original acceptance criteria for testing and are given enough oversight of the vendor and testing facility to ensure that the tests that will be performed to meet EPRI guidelines are both realistic and obtainable for the facility they are being installed into. Naturally, identifying the need for robust EMC design for the equipment prior to the manufacturing of the components in the first place would have prevented several of the intermediate steps to obtain EM compliance in the first place. In addition, much of the rigor that was done to ensure compliance for these AVRs is a direct result of the safety-related nature of the devices and the role they play to support the Emergency Diesel Generators at Palo Verde. It was often mentioned during discussions of this design change that similar rigor may not have been applied if this was not important to safety; and they would be correct.

The choice to perform plant mapping and using this data as input to the final testing acceptance certainly is not recommended for all installation applications. The mapping performed also
highlights one of the disadvantages to using the technique – lack of testing repeatability for other facilities due to the unique characteristics of each plant/facility. Had more robust oversight and engineering rigor been available prior to the first round of testing in 2007, by shielding the panel using an enclosure or reviewing the guidelines to ensure that there are no exceptions that could be taken credit for, it may have passed the first time. Since this testing has been completed, Palo Verde has continued to ensure that rigorous reviews of new modifications validate that the correct EPRI testing is identified, taking into account the unique situations of each component and always ensuring that the decisions made for EMI/RFI compliance also go hand-in-hand with other sound engineering, project, and station goals to continue the safe and reliable operation of the plant. In the end, that is the goal of this testing, and something that everyone, regardless of his or her knowledge of EMC, can agree with and understand.
Networking Considerations for Electric Actuation

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When considering the electric actuation industry, there are several hot topics of conversation and analysis. Some of these topics include non-intrusive electric actuators and their overall capabilities and construction. Other topics include the evaluation of diagnostics and maintenance information available through (or in support of) Computerized Maintenance Management Software (CMMS), Asset Management Systems (AMS), Field Device Tools (FDT), Device Type Managers (DTM), Electronic Device Description Language (EDDL), and other acronym “alphabet soup”. However, regardless of which initiative being evaluated from these camps of discussion, there is one fundamental topic that must be adequately addressed prior to truly considering data evaluation and data management—this topic involves data gathering (networking).

When discussing intelligent electric actuator network interface, there are several criteria that must be evaluated separately and holistically in order to make a truly informed decision. Some of the criteria that must be evaluated through the course of network technology selection include:

- Networking protocol type
- Network latency (throughput) and realistic capability
- Network reliability
- Network security

In order to focus the discussion of the selection criterion, this article will focus on the protocols that are presently most popular in the electric actuator market as well as how these protocols rank with respect to each other based on the selection criteria. These protocols include:

- Modbus-RTU/ASCII (referred to as Modbus Serial)
- DeviceNet
- Foundation Fieldbus H1 (referred to as FF-H1)
- Profibus-DP
- Profibus-PA

Also, in order to provide “food for thought” with respect to network selection, there are also several protocols that will be discussed at a high level so that the topic of network security may be more adequately addressed and considered. These protocols include some of the more popular Ethernet-based protocols:

- Modbus-TCP
- Ethernet-IP
- Foundation Fieldbus High Speed Ethernet (FF-HSE)
- Profinet

Networking Protocol Type

Through the course of evaluating which networking technology to use for intelligent electric actuator interface, the first step is to determine what type of communications protocol to use. The more popular classifications for protocol are proprietary and open. In today’s terms, the selection process is relatively simple for the type of communications protocol to use—as most of them that are widely available are industry open protocols. However, whether the overall networking solution involves an industry open protocol or a proprietary protocol, there are some things to consider prior to making the final selection:

- **Technical support for the protocol** is perhaps the most important criteria to consider. If the protocol is not well-supported through human interaction, protocol documentation, standards committees, or other means, then the possibility for successful implementation is dramatically affected.
- **Longevity of protocol** must also be considered during the evaluation. As protocols are typically “parented” by a company or a development organization/committee, the overall longevity of protocol is affected by the size of the supporting entity, the overall install base for the protocol, and the present life cycle status for the protocol (i.e.- has a replacement protocol been endorsed).
- **Overall ease of design and implementation** are also important topics to consider. Some protocols may require relatively little “overhead equipment” when implementing an overall network. Other protocols may require several networking appliances to support proper implementation (e.g.—media converters, networking gateways, etc.). There are also differences in the level of understanding required to support the various protocols.

Although all of the major electric actuator manufacturers offer a proprietary network solution (in one form or another), the designer must be prepared to select the final solution based upon what is best for the design application. In most cases, use of open protocols—such as Modbus, DeviceNet, FF-H1, Profibus-PA, and Profibus-DP—will reduce the overall number of components required to implement the network, will provide more technical sources for network support, and will improve the characteristics associated with other networking design principles (as discussed in the following).

Network Latency—Realistic Capabilities

All networking protocols and physical layer designs are capable of supporting particular baud rates (network speeds). However, based upon the protocol, there are typically different levels of performance that are expected based not only on the baud rate, but also due to the design (efficiency) of the protocol itself. Thus, in order to make a truly informed decision about a networking strategy, some of the “nuts and bolts” must be considered with respect to network latency.

- **Data throughput analysis** must start by first evaluating how much data must pass between an intelligent electric actuator and the associated upstream automation system. Evaluating the various offerings from the major electric actuator companies, it is not unreasonable to expect approximately 480 bits (60 bytes) of data to be exchanged between the read and write cycles. Approximately 60% of this data is used in the read cycle (from the intelligent electric actuator to the automation system), and 40% is used in the write cycle (from the automation system to the intelligent electric actuator). Thus, this is the basis of evaluation herein.

- **Network implementation baud rate** must be evaluated so that a basis of design/performance may be developed. This will be critical in supporting the overall expected and required responsiveness of the network (process control) interface. For the protocols of focus, the typical baud rates range from 19.2 kbps to 12 Mbps. These baud rates are typically dependent upon physical layer implementation (fiber optic or Copper-
based cable) as well as what is supported by the equipment manufacturer.

- **Overall protocol message** sizing must also be evaluated. In order to accurately determine how long it will take to move the data to/from the actuator, the “frame size” must be known. For instance, the frame size for a DeviceNet message is comprised of at least 47 bits (~6 bytes) of information. However, the allowable data size for a DeviceNet message is only 64 bits (8 bytes). Thus, the overall read/write cycle for DeviceNet would be 224 bits (~28 bytes) per electric actuator.

- **Actual network performance** relative to process control requirements must be evaluated using the information discussed above. To illustrate, if a DeviceNet network would be used for control/interfacing of 30 intelligent electric actuators, would this support proper process control at 500 milliseconds execution? In order to answer this question, some evaluation must occur:
  - DeviceNet can operate at a maximum baud rate of 500 kbps with up to 64 nodes using Copper-based thick cable”.
  - It was stated earlier that approximately 480 bits (60 bytes) of read/write data is typical for intelligent electric actuators.
  - DeviceNet requires at least 94 bits of framing for a complete read/write cycle (47 bits per read or write message).
  - In order to fully transfer all of the available actuator data to the automation system, the number of read cycles per actuator would be 5
    - 480 bits x 0.60 = 288 bits; 288 bits / 64 (bits/cycle) = 4.5 cycles; round up to the next whole cycle = 5 cycles.
  - If all write data were being provided to the actuator from the automation system, the number of write cycles per actuator would be 3
    - 480 bits x 0.40 = 192 bits; 192 bits / 64 (bits/cycle) = 3 cycles.
  - Thus, five overall cycles will be required for communications between each actuator to completely interface all data to/from the automation system (worst case). This equates to:
    - Read data: [4 cycles x (47 bits of framing + 64 bits of data)] + [1 cycle x (47 bits of framing + 32 bits of data)] = 444 bits + 79 bits = 523 bits.
    - Write data: [3 cycles x (47 bits of framing + 64 bits of data)] + [2 cycles x (47 bits of framing + 0 bits of data)] = 333 bits + 94 bits = 427 bits.
    - Overall read/write cycle = 523 bits + 427 bits = 950 bits. This equates to 28500 bits for 30 actuators.
    - At 500 kbps, the interface time for one complete data exchange for a network including 30 actuators would be: 28500 bits / 500000 (bits/second) = 0.057 seconds (57 milliseconds).

- Assuming that this DeviceNet network includes no other points of interface, it would be expected that the 30 actuators may be interfaced on one network to the automation system and satisfy a 500 millisecond task execution time.

When evaluating the protocols of focus, only one protocol is expected to be realistically limited with respect to network latency and satisfying a 500 millisecond execution time—FF-H1. FF-H1, according to the Fieldbus Foundation’s publication AG-181, should be limited to 6 nodes in order to support 500 millisecond execution. When satisfying 20% spare capacity for future growth/ expansion, this equates to 5 nodes used and 1 node available for future expansion.

**Network Reliability**

The next step in evaluating an intelligent electric actuator network interface is to consider the overall reliability of the control interface to the automation system. The approach that should be considered is simple in concept—hardwired IO control interface was a viable and functional strategy for many years—and is still functional. Thus, use of a networking control interface should not sacrifice performance or reliability for the sake of “using the latest technology”. Based on this philosophy, the overall reliability of the network solution should be as good as or better than that of a hardwired IO interface. Thus, elimination of single points of failure is one design principle/goal. If single points of failure can not be eliminated, then the overall risk of failure and its effects must be properly mitigated.

Based upon this, the overall single point of failure effects for a typical hardwired IO interface system should be understood to support proper selection of networking methodology and application:

- Hardwired IO modules are typically installed as non-redundant. Failure of a single module typically results in loss of all IO signals associated with that module.
- Hardwired IO module densities vary based upon signal type. Digital IO modules typically have a density in the range of 16 or 32 points per module. Analog IO modules typically have a density in the 8 or 16 point range.
- In order to mitigate the risk of a single master, single cable, or single master/single cable network application, the overall allowable number of nodes should not exceed a reasonable “tradeoff” value with respect to hardwired IO module density. Thus, it is recommended that 16 nodes maximum (12 nodes used, 4 nodes spare) be considered as good engineering practice for single master/single cable networking topologies. Using this as a basis of design should help mitigate the risk of network failure and attempt to equate it to the same (or a similar) level of risk associated with the hardwired IO control interface model.
  - Foundation Fieldbus H1 and Profibus-PA are not recommended for interface to intelligent electric actuators. Due to the network baud rates, latency limitations, and inherent properties of the electric actuators, applying a process Fieldbus to this equipment type is not a reasonable match.
  - Limiting network loading to 12 nodes used / 4 spare nodes is recommended for DeviceNet due to the typical single master/single cable architecture.
  - Limiting network loading to 12 nodes used / 4 spare nodes may be applicable to Profibus-DP and Modbus—depending upon network design and possible failure modes.

**Network Security**

The “last” design consideration to address with respect to electric actuation network interface involves data security. As the network interface is used for both status and control interface, security of the network interface between the automation system and the intelligent electric actuators must be considered. Thus, in the power industry, there are guidelines associated with cyber security that have been developed and are in varying stages of application for power plants as well as the electric grid. In other industries,
cyber security may be well defined or may merely be dictated by the company’s IT policies. Regardless of the situation, it is good engineering practice to exercise caution when using protocols or networking applications that utilize layer 3 of the OSI 7 layer model (i.e.—“routable protocols”). When considering routable networks, the most dominant networking technology that will be encountered is Ethernet. Ethernet can be used in several different applications and can support several different protocols of communication (ranging from industry open protocols as well as proprietary protocols).

When considering the use of a routable protocol, there are several to choose from. There are several varieties of Fieldbus available—Modbus TCP, Profinet, FF-HSE, EtherCat, Ethernet-IP, etc. There are a variety of acceptable communications physical layers: Copper UTP/STP cable, IEEE 802.11 wireless, Fiber Optic cable, etc. And there are several methods of networking implementation / architecture. However, there is one common thread that must be evaluated and addressed—how can information remain secure and how can operations remain reliable if routable protocols are suspect to malicious attack? The answer lies in the addition of networking appliances, upgrading network appliances, adding software settings, and possibly adding to existing physical security policies/procedures. As the intent of this article is not to discuss all possible impacts of cyber security with respect to networking application and economy, one overall broad conclusion can be made: additional cost will be incurred through the use of routable protocols—either through the addition of prudently designed security measures or through lost opportunity after suffering malicious attack.

Conclusion
In closing, it is the hope of the authors that this article will spur everyone to think about their networking applications in more detail. Attaining more plant information, more operability, and better troubleshooting capability through the use of networking control interface and intelligent electric actuators is a justifiable goal; however, progressing down the path of application without thinking through the overall design principles and end results will likely leave a sour taste in one’s mouth.

ISA POWID Executive Committee Update

The ISA Power Industry Division (also known as POWID) is organized within the Industry and Sciences (I&S) Department of ISA to provide a means for information exchange among engineers, scientists, technicians, and management involved in the use of instrumentation and control in the production of electrical power by any means including but not limited to fossil and nuclear fuels. The POWID Executive Committee (EXCOM) administers the activities of the division. The Executive Committee normally meets three times per year, traditionally in late winter or early spring, at the POWID Annual Symposium in June, and at or near the timeframe of the annual Fall ISA Automation Event. POWID Executive Committee meeting minutes and attachments have historically been posted on the ISA POWID website but that location has disappeared and ISA is working to restore it. As was the case previously, you must be a POWID member to view these minutes.

POWID Membership Recognition

By Dan Lee
POWID Membership Chair

The Power Industry Division (POWID) of ISA continues to grow. We would like to welcome all of our new, returning POWID members and our new student POWID members. We hope you will take advantage of everything POWID has to offer for your work and your career including the opportunity to network with power industry professional colleagues across the globe. Our primary goal is to provide a means for information exchange among engineers, scientists, technicians, and managers involved in instrumentation, control and automation related to the production of power. POWID is active in developing industry safety and performance standards, working closely with two ISA standards committees—ISA67, Nuclear Power Plant Standards, and ISA77, Fossil Power Plant Standards. The Division also conducts technical training and sponsors awards for power plants and individuals advancing instrumentation and control within the power industry. POWID welcomes your involvement in our division activities. Opportunities are available to provide information for our newsletter and website, to develop papers for presentation at our annual conference, and to participate in our division’s management structure. It’s a great way to get to know other industry professionals, to gain professional recognition, and to keep informed!

We normally would provide a list of new and returning members in our newsletter but the issues ISA has been having with its new website have been preventing access to the POWID member database. As you may have noticed, ISA’s conversion to a new website has not exactly met expectations. We should be able to provide the new and returning members listings for you in our next edition of the newsletter.
ISA67 Nuclear Power Plant Standards Committee Update

By ISA67 Committee Chair Bob Queenan

ISA Committee ISA67—Nuclear Standards—met on June 4th at the Hilton Resort in Scottsdale, Arizona, in conjunction with the 2014 POWID Symposium. There are five active subcommittees:

1. SP67.01 on Sensors, currently working on updating ISA-67.01.01-2002 (R2007) Transducer and Transmitter Installation for Nuclear Safety Applications.
2. SP67.02 on Instrument Tubing, currently working on updating ISA-67.02.01-1999 Nuclear Safety-Related Instrument Sensing Line Piping and Tubing Standard for Use in Nuclear Power Plants.
3. SP67.03 on Leak Detection, currently working on a complete revision to ISA-67.03-1982 - Standard for Light Water Reactor Coolant Pressure Boundary Leak Detection.
5. SP67.06 on Performance Monitoring, currently reforming to update ISA-67.06.01-2002 Performance Monitoring for Nuclear Safety-Related Instrument Channels in Nuclear Power Plants.

In other business, the committee members are exploring several areas where additional guidance may be useful, including Nuclear Human Factors, RTD Cross Calibration Practices, Setpoint Control Programs, and Calibration through Normalization.

SP67 and its various subcommittees are always looking for new members willing to volunteer their time and energy to develop consensus documents that provide industry guidance. Please contact the chairman, Bob Queenan, at bob_queenan@yahoo.com if you’re interested in joining the work.

More information about the ISA67 Committee and its activities can also be found at the ISA67 committee website.

ISA77 Fossil Power Plant Standards Committee Update

By ISA77 Committee Co-Chairs Bob Hubby and Daniel Lee

Hello! POWID Industry members! I am pleased to report that the ISA77 committees have made very good progress in the reaffirmation/revision of multiple standards. First, ISA 77.42.02 Feedwater Controls—Drum Level Measurement has completed its revision cycle and should be (if not already) published soon. Thanks go to Jerry Gilman (committee chair) for completing this revision cycle. During the first half of 2014, the ISA77 committee members have promptly returned committee reaffirmation ballots. As a result, many very good comments have been received on these documents. Several subcommittees held physical meetings after the POWID Symposium and either have completed the resolution of their comments or have made good progress in resolving the comments. Based on the progress made to-date, the following three documents will be balloted soon and should be published before year’s end;

- ISA-TR77.30.01 Dynamic Performance Test Methods and Procedures (new document)
- ISA-77.41.01 Boiler Combustion Controls (revision)
- ISA-77.70.02 Instrument Piping Systems (revision)

A few committees still have to resolve comments before issuing their document for balloting. The following documents will be balloted later this year and should be published Q4 2014 or Q1 2015:

- ISA-77.13.01 Steam Turbine Bypass Systems (revision)
- ISA-77.14.01 Steam Turbine Controls (revision)
- ISA-77.43.01 Unit/Plant Demand Development (revision)
- ISA-RP77.60.02 Hard Panel Alarms (revision)

Two documents still required author assignments and thus, will not be balloted until next year:

- ISA-77.22.01 Power Plant Automation (new document)
- ISA-TR77.70.01 Tracking and Reporting Instrument Documentation (revision)

If you are interest in any of these topics and would like to contribute in the development of these standards, please contact the respective committee chair. Most committee meetings are held via web meeting so no travel is required. Your technical input is greatly appreciated.

The ISA77 committee last met on June 4th at the Hilton Scottsdale Resort after the POWID Symposium. When ISA updates the web site, the ISA77 committee meeting minutes can be found via the ISA77 committee web site.