

PHILADELPHIA SECTION of the IEEE

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Burlington, Camden, Gloucester (NJ)

Almanack



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November 2014

SECTION MEETING

Nov. 18, 2014

Dinner: 6 pm

Speaker: 7 pm

Sheraton University City
Philadelphia

Meal Cost: \$25.00 (students \$15.00)

Parking cost paid by section

Joseph Maida

Variable Speed Drives

Oliver Hoehne

Overcoming Engineering Silos by
Applying Systems Engineering Principles

Note: In the event of bad weather please call the Sheraton after 1pm the day of the meeting at 215-387-8000. Ask the front desk if the meeting has been canceled.

November 2014

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Chair's Message



By Philip Gonski, P.E.

Some of us may remember the most excellent talk we had about a year ago from Dr. Phillip Laplante, P.E on the topic of licensing for electrical engineers involved in software development and other areas. The talk was followed by a rigorous and thought provoking discussion on the pros and cons of having P.E. licensure (Professional Engineer) become more readily utilized in all branches of engineering.

For starters, most of the state boards forbid the usage of the term “engineer” in any business card, company name, or practice, unless you are a board certified “engineer.” Most of the discussion centers around what is truly work that involves “safety”, or where an error may impact the general public.

(http://www.portal.state.pa.us/portal/server.pt/gateway/PTARGS_0_185581_1059258_0_0_18/EngLSGeo%20Act%20367.pdf)

In my daily practice, it is unquestionable that licensure should be mandatory, as electrical design work directly involves safety and code enforcement. Believe me, anytime my name goes on a set of construction drawings, I make extra-double sure that everything is correct. However, for other areas of electrical engineering, it is less clear. Software if improperly designed could lead to loss of revenue, car accidents, or even directly impact safety, if a program or controller causes property damage. The safety argument can just about be applied to everything.

Certainly no licensure is without flaws, as reading my monthly P.E magazine informs me of all the licensed engineers that had violations, and cases where a P.E. signed drawings he did not review. Despite this, I tend to favor increased licensure as many are then bound both financially and legally to uphold a certain level of conduct and quality.

What do you think?

*Philip M Gonski, P.E
IEEE Philadelphia Section Chair
www.ieeephiladelphia.org
Project Manager - Keystone Engineering Group
(c) 630-363-0790*

IEEE PHILADELPHIA SECTION CONGRATULATES OUR NEW SENIOR MEMBERS!

A recent A&A Review Panel meeting was held on September 13 in Toronto. We had three elevations. Congratulations to:

Mark Brozina, also in Power and Energy Society
Phillip Gonski

Christopher Peters, also in Microwave Theory and Techniques Society, and Nuclear and Plasma Sciences Society.

IEEE NIGHT

Philadelphia Section Meeting

Joint with: Magnetics (MAG), Reliability (R), Vehicular Technology (VT)

Date: Tuesday, November 18, 2014

Time: Dinner is at 6 pm. Program starts at 7 pm, and 8 pm.

Location: Sheraton University City, 36th and Chestnut, Philadelphia

Cost of dinner is \$25.00 (students \$15.00); meeting only is free (Real cost of dinner is higher, which is mostly subsidized by section)

Reservations are needed, call 484.270.5136 or email the section office.

sec.philadelphia@ieee.org or use vtools in the web site

Indoor parking is at location and paid by section. Bring ticket to be stamped.

Note: In the event of bad weather please call the Sheraton after 1pm the day of the meeting at (215) 387-8000. Ask the front desk if the meeting has been canceled.

Evolution of Adjustable Speed Drives

Joseph Maida, P.E.

Variable Frequency Drives are becoming more and more common in commercial and industrial applications. Using actual projects, this talk will describe adjustable speed drives that were installed over 30 years ago and the variable frequency drives that have or will replace them. Understanding the functions of the adjustable speed drive systems will give the attendee an appreciation of the engineering talent that existed 30-plus years ago.

Understanding current VFD topologies and why VFDs can duplicate and enhance the function of the adjustable speed drives will give the attendee an appreciation of today's engineering talent, which may seem easier but is just as complex.

Joseph Maida, PE, President - Maida Engineering, Inc.

Education: BSEE, Drexel University – 1971, MSEE, Drexel University – 1976

PE Licenses: PA, NJ, DE, NY, GA, FL, TX, TN, MA, ID, IA, NC, WV, AR, ALBERTA

LEED: Accredited Professional

PA - UCC Advisory and Review Council Member 2009 -2011

Mr. Maida leads a company that strives to provide harmonious working environments while challenging and utilizing the technical and managerial talents of its employees, thus enabling them to provide the highest quality of engineering and design to its industrial, commercial, government and automation and control clients.

Mr. Maida has provided project management and overseen or performed engineering services for the following recently completed projects:

- The replacement of an existing wind tunnel's AC wound rotor and DC motors with an 18,000 HP synchronous motor and a 22,000 HP, 36 pulse VFD.
- The installation of 5 MW Standby Power Distribution System and Priority Load Management Control System for a Pharmaceutical R&D campus.
- A new cement plant's 34.5 KV and 4,160 Volt, 20 MVA power distribution systems
- Hazardous area analysis for areas containing fossil fuel dust



- Numerous power system studies including load flow, voltage drop, short circuit, equipment evaluation, TCC Coordination, motor starting, harmonics, and arc flash analyses
- Remodeling of numerous commercial kitchens
- The study for upgrading a large data center's standby and interruptible power supplies
- The installations of new services, feeders and branch circuits for pharmaceutical and fiberglass manufacturing plants, HVAC/mechanical equipment and renovations to building and processes.
- Medium Voltage Emergency Power Generating and Distribution Systems for Pharmaceutical Research Facilities and Large Hospitals

Overcoming Engineering Silos by Applying Systems Engineering Principles – Case Study: California High-Speed Rail System

Oliver Hoehne, Parsons Brinkerhoff

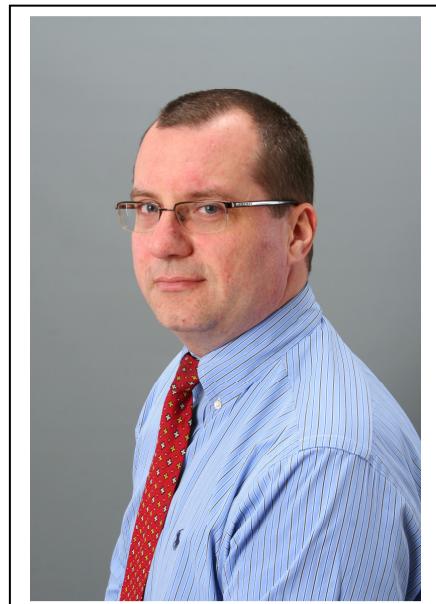
Due to their size, large projects are often subdivided into a number of smaller organizational and functional units to remain manageable. Examples include division by subsystem (e.g. operations, infrastructure, track, systems, rolling stock, etc.), or by procurement contract (e.g. guideways, tunnels, stations, facilities, systems, etc.). Each unit is typically managed independently, reporting to an overall program/project management chain of command. While this addresses the need for scope, cost and schedule management, it is often at the cost of an inclusive, global engineering perspective. This frequently leads to “engineering silo” solutions, which, though perfectly designed and functional as standalone systems, may not necessarily be compatible with each other.

The effects of independent engineering are often not identified until late in the project, typically during construction, system integration or start-up testing. Contracts might have been accepted before it is realized that the subsystems are not fully compatible with the rest of the system.

The presentation will provide an overview on how the California High-Speed Rail System (CHSRS) project uses Systems Engineering (SE) principles to overcome the engineering silo mentality, leading to a better product with fewer defects, unplanned rework and associated negative impacts on cost, schedule and reputation.

Oliver Hoehne is a senior engineering manager in transit and rail systems with Parsons Brinkerhoff (PB). He has extensive international and domestic experience in project management and Systems Engineering, including analysis, design, implementation, integration and testing of systems in subway, commuter, and high-speed rail projects.

Mr. Hoehne specializes in the engineering and integration management of multi-contract, mega-projects where strong coordination is required between operations and maintenance, safety, railroad and electrical/mechanical systems, civil/structure infrastructure elements including the track alignment, guideways, track work, stations, maintenance facilities, and rolling stock. Mr. Hoehne is currently the Systems Integration Manager on the California High-Speed Rail System Project.

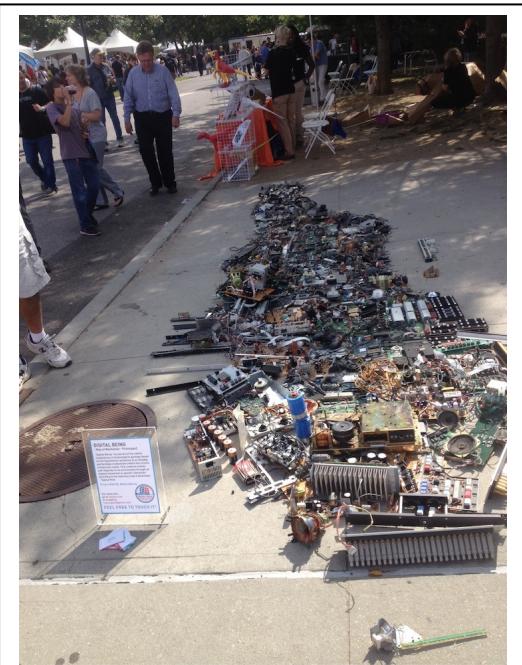


We went to the Maker Fair

By John Ianuzzi



Group shot of a busload from Philadelphia Section



Manhattan Island Map made of electronic parts



Kids testing out Arduino kits

On September 20, the Philadelphia Section IEEE hosted a bus trip to Maker Faire 2014. The event was held at the New York Hall of Science in Flushing Meadows, NY.

The bus left the pick-up spot in Cherry Hill, NJ at 7am Saturday morning, loaded with students and teachers from the MAST Charter School, Rowan University, and assorted members and non-members of the IEEE. The ADCOM was represented by Phil Gonski, Mark Soffa, Robert Lawson and yours truly.

Maker Faire is proclaimed to be “The biggest Show and Tell on Earth,” and is an exposition/celebration for do-it-yourselfers (DIYs). Makers are kids, students, teachers, entrepreneurs, moms and dads, virtually all DIYs that have a strong desire to bring a vision or idea to life. Entire families share experience and knowledge with parents and kids working together for a common goal.

The New York Hall of Science provided an excellent atmosphere for the event. The grounds around the museum contained most of the larger demonstration areas in addition to the workshops, food concessions and projects. The admission cost for Maker Faire also allowed entry into the museum where there were many, more projects interwoven between exhibits.

3D printing technology was well represented again this year, but on a much larger scale. The larger printers can replicate bigger items. There was even an electric car created by integrating 3D printed parts. Quad-rotor drones also increased in scale this year with some that could lift items weighing up to 100 lbs.

Many start-ups, Kickstarter, and spin-off electronic kit vendors proved that the entrepreneurial spirit is alive and well among DIYs. Intel, TI, MicroChip and other high-end sponsors demonstrated new products and technologies including the Internet Of Things (IoT). IoT is a technology whose goal is to reduce the size and cost of electronics, allowing “anything,” such as, heaters, home security systems, cameras, etc. to be connected and controlled through the internet.

Walk-in workshops for soldering, woodworking, building and launching air-propelled rockets and paper airplanes rounded off the event. Short technology seminars were also held every couple of hours or so, describing technologies and applications. On the lighter side, we were entertained by 100+ spouting bottles of Diet Coke and Mentos plus a full size replica of the old “Mouse Trap” board game.

This was the first time that the Philadelphia Section IEEE sponsored a trip to Maker Faire. There was a lot of positive feedback from members and students about the event and even some complaints that there “was not enough time!” The New York Hall of Science will most likely host Maker Faire 2015. With its increasing popularity, we would like to make it an IEEE yearly event.

I would like to thank everyone who helped make this trip possible including Sharon in the Section office who did a lot of the legwork, members of the ADCOM who helped spread the word and the students and teachers for recognizing the educational opportunity that the event presented.

Maker Faire is presented by Maker Media who publishes Make Magazine. Additional information about Maker Faire can be found at: <http://makerfaire.com/new-york-2014/>

IEEE NJ Coast Section
Conference on Information Security/Cyber Security and Privacy
November 12, 2014 (Wednesday)
IEEE OC, Piscataway, New Jersey 08854, USA

Since the turn of the century, information security, cyber security, and privacy have become more critical in our business, government, travel, healthcare, and every-day lives. With society's exploding dependence on online, digital, and wireless technologies, effective government-compliant security solutions have become increasingly important in everyday life. Whether you are a security expert or a novice, practical solutions are crucial in your industry as well as personal life. Join us at this upcoming conference to hear more about these important topics from business, academia, and research. Take some time with us to catch up on the latest trends, review the issues, and take away practical ideas to enhance security of your world.

Keynotes, Invited Speakers, Students, and Industry Representatives

The day will begin with a social breakfast. The morning keynote, 'Wanted: A Revolution in Security Research' will be delivered by Dr. Gus de los Reyes, AT&T Chief Security Officer, R&D, and the afternoon keynote, 'Mobile Management and Security' will be delivered by Mr. Caleb Barlow, IBM Director, applications, data and mobile security. Both talks promise to be up to the minute, exciting, informative, and thought provoking.

Visit the many industry representatives participating in the event to learn about the latest commercial solutions. Lively discussions with the keynote speakers, invited speakers, peers, and student poster judging will continue over breakfast, lunch and afternoon snack breaks – which are included in the modest attendance fee. Concluding remarks, prizes and awards will end the day.

Who Should Attend?

This conference is geared to IEEE members, non-members, students, and guests who would like to review the state of the art in security, cyber security, and privacy and become aware of issues and directions of research, academic, and practical solutions.

What Will You Learn at This Conference?

If you have considered learning more about security, this is an ideal event to attend. Awareness of security, cyber security, and privacy improves your job, consulting, and life skills. You will get Professional Development Units PDU (Continuing Education Units (CEU)).

Venue

The venue for this conference, IEEE Operations Center (OC) in Piscataway New Jersey, is a premier location to attend an event. The IEEE OC is steeped in history; this location holds artifacts and multimedia installations recounting the achievements of IEEE engineers and marks the significant engineering innovations from various disciplines worldwide. Bring a friend, colleague or student.

Attendee Registration	Before Sept 15	Before Oct 17	After Oct 17
IEEE member	\$35.00	\$45.00	\$65
IEEE student	\$15	\$25	\$50

member/Life Member			
Non-Member	\$100	\$125	\$150
Non-Member student	\$25	\$35	\$50

Industry Representatives Registration	Before Sept 15	Before Oct 17	After Oct 17
Table & Product demonstration	\$500.00	\$600.00	\$700.00
Product Presentation	\$500.00	\$600.00	\$700.00

[The gray cells are historical prices for early registration]

For More Information please visit the IEEE New Jersey Coast Section website

<http://sites.ieee.org/njcoast/>

Please register at

https://meetings.vtools.ieee.org/meeting_view/list_meeting/25959

For your information, IEEE Membership fees are: \$187/year (IEEE Student Membership fee: \$32/year)

The agenda is at the meeting web site.

Students plan Sumo Robot Scratch Tournament

By Jeffrey Eker, Rowan Branch IEEE Chair

Thank you very much to all who came out to the Sumo Robot Kit Competition 9/26. That event was extremely successful and we look forward to seeing everyone at the next competition.

Additional thanks to those who have already expressed interest in the **Sumo Robot Scratch Tournament which will be held 11/21 from 7:00-9:30pm** in the Rowan Hall Atrium at Rowan University. This competition allows for more use of sensors or entirely constructing a robot from scratch. Pololu kits from the last competition are free to compete.

The rules are too long for the Almanack and so the editor posted them on the web site of the section. Feel free to reach out with any questions or clarifications.

Ekerj53@students.rowan.edu 856.535.5675

IEEE PHILA. SECTION OFFICERS

Chair: Philip Gonski, P.E.; pgnski@gmail.com

Vice Chair: Adam Fontecchio, Ph.D.; sec.philadelphia@ieee.org

Treasurer: Richard Primerano, Ph.D.; sec.philadelphia@ieee.org

Secretary: Leonardo Urbano, Ph.D.; sec.philadelphia@ieee.org

Past Chair: Mark Soffa msoffa@kns.com

Adcom meets second Tuesday of the month (Nov. 11) at the Sheraton University City. Members are welcome to attend. Reserve a seat by calling the office by the Friday before.

Call for Papers and Participation
5th IEEE Integrated STEM Education Conference (ISEC '15)
Friend Center at Princeton University
Princeton, NJ

Save the date! Saturday, March 7, 2015

Paper and poster submissions for the **5th IEEE Integrated STEM Education Conference** (ISEC '15) are now open through 11:59 pm EST **Sunday, November 30, 2014**. The submission link is provided on the conference's home and author information pages. Alternatively, you can access the submission site at <http://edas.info/N18323>. Please note that you will need to register with EDAS before submitting your paper or poster if you are a first-time user.

This year's theme is **Creating a Culture of Achievement**. While all papers on methods of and experience with integrating education (or interdisciplinary education) in science, technology, engineering, and mathematics (STEM) studies throughout P-20 (that is, pre-kindergarten through graduate studies) are welcome, we are very interested in papers on STEM initiatives that have resulted in improved student performance in STEM studies, especially among students from underrepresented populations in the disciplines.

Acceptances will be sent no later than **Sunday, January 4, 2015**. Information on **student travel awards** and **conference housing** will be available by that date as well. The conference hotel is the Westin Princeton at Forrestal Village, a short drive from the Friend Center. The conference room rate, good for Friday, March 6 and Saturday, March 7, 2015, is \$109/night.

We are very pleased to announce that Christine M. Cunningham, PhD, founder and director of Engineering is Elementary (Boston Museum of Science) and a Fellow of ASEE; and Sonpreet Bhatia, co-founder and CP&TO of MobileROI will be our keynote speakers. And the best paper award returns for its third year!

ISEC 2015 is sponsored by the IEEE Princeton / Central Jersey Section with technical sponsorship by IEEE Region 1 and IEEE Education Society.

Please follow us on Twitter (@ISEC15), like us on Facebook (search for ISEC); email us at isec.march7.2015@gmail.com; and visit us at <http://ewh.ieee.org/conf/stem> for submission instructions, templates, and registration fees. We look forward to your participation in ISEC 2015!

****PLEASE NOTE DATE CHANGES FOR OUR ASSOCIATED CONFERENCES****

Information on the **40th Trenton Computer Festival**, which will be held on **Saturday, March 21, 2015**, is available at <http://tcf-nj.org>, and on the **Information Technology Professional Conference**, which will be held **Friday and Saturday, March 20-21, 2015**, is available at <http://princetonacm.acm.org/tcfpro>.

Apologies for cross-postings/duplicates.

Design of Delay Locked and Phase Locked Loops

Joint Meeting of IEEE Philadelphia Chapters of CSS, CAS, SMCS and AESS

Meeting Details:

Speaker: Saeed Abbasi; Principal Engineer, Advanced Microelectronic Devices.

Date: Monday, November 10, 2014

Time and Location: 7:00 PM - 8:30 PM; Tolentine Hall, Room 215, Villanova University, 800 Lancaster Ave., Villanova, PA.

Cost: No Charge.

Registration: vtools to register online.

Abstract: Using phase-locked loops (PLL) and delay-locked loops (DLL) are two techniques that have contributed significantly to the cutting edge development of chips in the past 20 years. The invention of PLL schemes has made this intellectual property (IP) very important for any system on chips. This presentation will address three phases of DLL/PLL development: 1) system design, 2) noise modeling and 3) design approach. Each section will cover the theoretical and practical aspects related to each phase. Discussion of system design will include detailed comparisons between different loop architectures with their advantages and disadvantages. Noise modeling will focus on the impact of each cell on the total RMS jitter. Also, different design practices will be presented for each cell in the loop and cells that are interfaced with each other. In conclusion, an overview will be given on the theoretical concepts used to optimize IP design performance.

Biography: *Saeed Abbasi* has lived and worked in the Philadelphia area for over 30 years. He received his B.S. and M.S. degrees in Electrical Engineering from Villanova University in 1993 and 1999, respectively. He is a member of the National Engineering Honor Society (TAU BETA PI) and ETA KAPPA NU Association. He holds 15 patents and patents pending related to phase-locked loop, delay-locked loop, analog-to-digital converter, digital-to-analog converter and fast crystal startup oscillator circuits. Several of his PLL and DLL patents focused on multi-GHz clock signals from CMOS 180 nm to CMOS 20 nm technology. He spent the majority of his career on mixed signal CMOS circuit design for Tyco and ATI/Advanced Microelectronic Devices (AMD). His most recent interests as a principal engineer (PMTS) for AMD include low power and high frequency analog/digital CMOS circuit design in the multi-GHz range for CPU, GPU and APU. He also maintains a strong interest in the design of circuits in more exploratory technologies.

IEEE Philadelphia Employment Network Group

George Butts, IEEE Philadelphia Employment Network Group Chair

610-675-7879, george@georgebuttsjr.com

Date: Thursday, November 20th, 2014 **Time:** 7:00 PM - 9:00 PM

Topic and Speaker: IEEE Employment Network - Job search topics, open discussion roundtable and professional networking – Moderated by George Butts

Location: Drexel University Campus

Building: Bossone Enterprise Center, Room Number: Room 709, 7th Floor
3128 Market Street, Philadelphia, Pennsylvania 19104

Cost: No Charge, snacks and drinks will be served

Parking: Parking: Nearby lots: (1) On the left side of Market Street just before 31st Street; (2) on the right side of Market Street, just past 31st Street; (3) from Market make Left on

36th to University City Sheraton garage. Public Transportation: SEPTA (Rail: 30th-Street Station; Subway and Trolley: The Market-Frankford Line (the Blue Line) stops at 30th and 34th Streets and all trolley trains (the Green Lines) stop at 30th and 33rd Streets.)

To register for this event use vtools: <https://meetings.vtools.ieee.org/m/29503>

*** Join our group on LinkedIn for the latest updates and articles related to IEEE Employment around the Philadelphia Region - Search LinkedIn Groups for "IEEE Philadelphia Employment Network" ***

Almanack Staff

Publisher: Phil Gonski, P.E.

Editor: Peter Silverberg

Asst. Editor: Janet English-Cartwright, Ph.D. jenglish@fi.edu

News and notices contact psilverberg3@comcast.net or 856.461.6615 or fax 509.461.6617

Deadline for the December issue is November 11, 2014

New & improved web site: www.ieeephiladelphia.org

ADVERTISE IN THE ALMANACK:

The Philadelphia Section of the IEEE encourages placement of technical, professional, promotional and commercial advertisements in the Almanack. The Almanack is published ten times a year and is read by more than 4,000 members with an average annual salary of over \$70,000 in over 150 key industries. For more information, contact Peter Silverberg at 856.461.6615 or psilverberg3@comcast.net

Rates:

Full Page: 7.5x10: \$100

3/4 Page: 7.5x7.5: \$75

1/2 Page: 5 x 5: \$50

1/4 Page: 2.5 x 5: \$25

1/8 Page: 2.5 x 2.5: \$12.50

Main Office: 11 Bala Avenue, Bala Cynwyd PA 19004, 484.270.5136

sec.philadelphia@ieee.org

Want to Judge a Science fair?

The Section has managed to provide three or four judges each year. We could supply more if you would volunteer. While there is an IEEE prize, there are other categories that could use people.

Judging day for the 2015 Delaware Valley Science Fairs (DVSF) will be Wednesday, April 1st, 2015 at the Greater Philadelphia Expo Center in Oaks, PA. Registration is open through our website at www.dvsf.org <<http://www.dvsf.org>>. All correspondence will be done through e-mail so it is crucial that we have your correct e-mail address. Please 'spread the word' to all your colleagues about this exciting and worthwhile program. Additional information is posted on our website.

We are always looking for mentors to work with the students. If you are interested in being a mentor; go to our website (see above) and click on "Mentorship Program"



Meeting of the Philadelphia Joint Chapter



IEEE Power & Energy and Industry Applications Societies

Topic:	Failure Modes of Common Medium Voltage Fuses
Speaker:	Stephen Cress, P. Eng., Kinetrics Inc. Power and Testing Labs
Date and Time:	Wednesday, November 19th, 2014 Lunch @ 11:45 AM; Presentation: Noon – 1:00 PM
Cost:	No Charge for Presentation \$13 for buffet lunch (\$10 for Full-Time Students)
Location:	Burns Engineering, Inc. 1835 Market St., Suite 300, Philadelphia, PA 19103
Public Transportation:	SEPTA (Rail to 30th Street or Suburban Station and/or Trolley to 19th & Market Street)

Reservations: Register by visiting: www.ieeephiladelphia.org and click on "Section Meetings and Events" to register on v-Tools. If you have problems or cannot register online, e-mail or call Jonathan Schimpf at jschimpf@burns-group.com or 215-979-7700, ext 7709, by 5:00 p.m., Tuesday, November 18th, 2014
(Specify if you want lunch – We pay in advance)

Abstract: The failure of electric fuses used in industrial and power distribution applications can lead to adverse consequences ranging from costly nuisance outages to dangerous incidents, depending on mode of failure. It is important that those selecting and applying fuses are aware of these potential failure modes and methods to reduce the likelihood of failure. This presentation will review various general categories of fuses used in medium voltage applications and significant features of their designs. With this background, some practical techniques for selection of the appropriate fuse for the particular environment will be provided. Utilizing and understanding the fuse time-current and I^t characteristics, and applying damageability bandwidths accounting for per-loading, ambient temperature and electrical damgeability, will all assist in avoiding problematic fuse failures.

The Speaker: Stephen Cress, P. Eng. has over 35 years of experience in technical investigations, application, standards development, qualification testing and research for electrical power systems and equipment. He has conducted major investigations for North American power utilities dealing with distribution system protection, failure and root cause analysis and other aspects of system protections. Stephen specializes in the areas of distribution overcurrent protection, failure investigations, and arc hazard analysis and holds of a US patent on a high voltage current limiting fuses. Along with several significant professional accomplishments, Stephen also Chairs the Canadian Standards Association Committee on Distribution Fuses and is a Professional Engineer in the Province of Ontario, Canada.

***** A Certificate of Attendance will be available upon request *****

Chapter Chair: Mike Reynolds, Burns Engineering - mreynolds@burns-group.com (215-979-7700, ext 7717)

Vice Chair: Affan Abdullah, Sargent & Lundy, LLC - Affan.A.Abdullah@sargentlundy.com (302-622-7228)

Secretary: Jonathan Schimpf, Burns Engineering - jschimpf@burns-group.com (215-979-7700, ext 7709)

Treasurer: Tim McBride, Eaton Corporation - Timothy.McBride@eaton.com (610-497-6137)

Membership and Programs: Barney Adler, PECO - b.adler@ieee.org (215-731-3240)

Professional and Educational Activities: Rich Delp, Schiller and Hersh Associates - r.delp@schillerhersh.com (215-886-8947)

Programs and Public Relations: Bob Swayne, Burns Engineering - r.swayne@burns-group.com (215-979-7700, ext.7781)

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