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THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.

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So how did we get here?

Electrical engineering is a relatively new field of study, being around for just over a century-and-a-quarter (compared to engineering disciplines such as civil, which has existed in one form or another for thousands of years). So how did we achieve so much in so little time?

Learn about your profession by exploring the Engineering and Technology History Wiki, a partnership between the United Engineering Foundation and professional groups including IEEE.

Visit: <http://ethw.org>

Upcoming Meetings

EXCOM Meeting

Tuesday, June 7th, 2016 5:30PM at TECO Plaza

Register online at <http://time2meet.com/fwcs-excom/index.html>

Open to all FWCS Members

Reducing Power System Losses Seminar

Wednesday, June 8th, 2016

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Great Bay Distributors Tour

Tuesday, June 14th, 2016

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Distributed Resources—Operation, Protection, and Control

Friday, July 29th, 2016

Details on page 6

IEEE Member-Get-a-Member (MGM) Program

No one knows how beneficial IEEE membership is to technical and career development better than IEEE members. Consider sharing your IEEE membership experience and get rewarded for doing so. Through the Member-Get-a-Member (MGM) program, IEEE rewards your efforts in recruiting new members. Your local IEEE Section can also benefit.

Professional members can earn:

- US\$15 for each Professional member recruited
- US\$5 for each Professional member recruited to e-Membership (offered in developing nations only)

Student members can earn:

- US\$2 for each Student or Graduate Student member recruited
- US\$15 for each Professional member recruited
- US\$5 for each Professional member recruited to e-Membership (offered in developing nations only)

The maximum amount a member can earn during the membership year is US\$90.

For more information on this membership benefit that pays, please see

<http://www.ieee.org/mgm>

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<http://www.ieee.org/benefits> Global Benefits Finder

<http://www.ieee.org/discounts> Discounts Page

PE Corner

Art Nordlinger, PE, Senior Member

Continuing Education Math

The Florida Board of Professional Engineers' recent newsletter announced that the upcoming licensure renewal cycle will open on November 7, 2016. The big change for this renewal is that each engineer must have 18 Continuing Education Hours (CEH), up from 8 in the last cycle.

You may be asking, "Why the change?" A number of explanations have been presented. In my view, the most logical one (we're all engineers, right?) is that the new requirement is more in line with what other states require of their engineers, as well as what other professions require of their licensees. In fact, statistically the current requirement of 18 CEUs is a bit on the low end compared with others. So the previous requirement of just 8 was, well...

It is important to understand the breakdown of the new requirement. According to Chapter 61G15-22.001, Florida Administrative Code, the 18 hours comprises:

- One hour must relate to chapter 471 Florida Statutes, and the rules of the Board.
- One hour must relate to professional ethics.
- Four hours must relate to the licensee's area of practice.
- The remaining [12] hours may relate to any topic pertinent to the practice of engineering.

I would note that the requirement of four hours of continuing education in the licensee's area of practice hasn't changed. Hopefully, you've started to acquire those, as well as the required additional 12 hours. Those additional 12 hours can be an opportunity to come back "up-to-speed" on an area of engineering that you many have once learned but don't use regularly in your practice of engineering. Or it can be an opportunity to learn something new.

In terms of learning something new, many other professional societies, including the Florida Engineering Society, offer courses that qualify for CEHs, just as IEEE does. Check out their websites to see what they are offering locally that might interest you. Availing yourself of other society's course offerings helps them to continue to provide content to their members and others at a reasonable cost, just as IEEE FWCS does in the Tampa Bay area. Most of them also give back in many ways to our local communities, and supporting them helps in those efforts as well.

In case you missed it, IEEE recently hosted a combined Rules and Laws and Ethics seminar. If you didn't attend but would like for IEEE to repeat this program at a later date (before the renewal deadline), let one of your officers know. If we have sufficient response we will ask the Board whether a Board member is available for an "encore performance."

Whether you are a PE looking to attain required CEHs, or an engineer looking to learn something new or keep current with the latest trend in the profession, IEEE has seminars that will meet your needs. And for the PEs, don't forget that the next renewal deadline is only 8 months away. Better start earning those CEHs now!



Joint Chapter of IEEE PES/IAS

As we prepare for another academic year at USF, the Department of Electrical Engineering is seeing a noticeable increase in interest in the power and energy area — a trend that the power industry needs to address issues such as an aging workforce and the deployment of new technologies in the industry. At both the undergraduate and graduate levels, enrollment in power courses is up, and that increase looks to be a trend — not just an anomaly. Last year, the USF PES/IAS Student Chapter became active after several decades of dormancy. Student participation in FWCS activities is at an all-time high, and overall student enthusiasm in IEEE is surging.

It is critical for the good of our profession to keep this momentum going. There's a role for every FWCS member to help keep the ball rolling. As more students complete power electives, a growing supply of co-op students and interns is building. Could your company benefit by tapping into this resource? Co-ops and interns provide a fantastic value to employers, not to mention an opportunity to “test drive” a prospective employee for months before committing to a job offer.

Students benefit tremendously through mentorship programs. While the university focuses on developing technical proficiency, so much more is needed to be successful in industry. Mentors willing to share their professional experiences can help forge a fledgling student into a vibrant engineer.

Emphasizing design in the engineering curriculum has been an objective for many years. Practical design projects are always being sought. Think of the potential when a team of motivated students is unleashed on a pesky design issue that you just haven't found time to tackle!

The PES/IAS Student Chapter is interested in having professionals come to talk with the student body, sharing technical or professional knowledge and providing guidance and wisdom to help the students get their careers off to a good start.

And the Electrical Engineering department is very interested in your thoughts and ideas to help shape our curriculum. As the industry evolves, so too must our education system. Your input is vital to keep our programs aligned with your needs.

If you are interested in helping with any of the areas mentioned or in other capacities, please contact Dr. Ralph Fehr at r.fehr@ieee.org. We look forward to welcoming you to the USF community. Go Bulls!

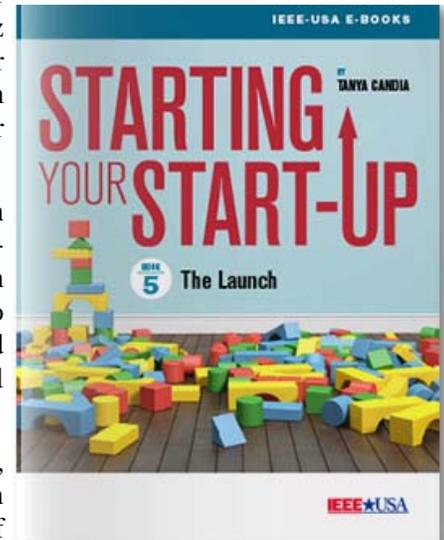
FREE EBOOK

This E-book features launching a start-up.

Starting a business, according to author Tanya Candia, should achieve well-defined goals: “[It] should build brand awareness, smooth the process for sales efforts, build buzz around the company or product, and result in benefits that last far beyond the launch.”

This e-book, the last in the “Starting Your Start-Up” series, is replete with exercises designed to assist in planning and executing a successful launch.

From 1 May to 15 June, IEEE members can download a free copy of “Book 5: The Launch” at <http://shop.ieeeusa.org/usashop/product/careers/76170>. Log in with your IEEE Web account, add the book to your cart and use promo code MAYFREE16 at checkout.



Coming up...

In June, IEEE-USA E-BOOKS will offer “Shaping an Engineering Career -- Book 2: Dual Career Ladders.”

The dual career ladder represents the choice of career paths many engineers face: technical, management or both. Authors Raymond Floyd and Richard Spencer offer their insight into this phenomenon.

For more on the dual career ladder, see <http://insight.ieeeusa.org/insight/content/careers/60215>.

Seeking Authors

Do you have an idea for an e-book you think will benefit your fellow members? If so, IEEE-USA E-BOOKS would like to hear from you. We are seeking authors to write an individual E-book, or a series, on career guidance and development topics.

Please email your proposal to IEEE-USA Publishing Manager Georgia C. Stelluto at g.stelluto@ieee.org.

IEEE-USA serves the public good and promotes the careers and public policy interests of nearly 200,000 engineering, computing and technology professionals who are U.S. members of IEEE.



Reducing Power System Losses Seminar

Date:	Wednesday, June 8, 2016	Speaker:	Ralph Fehr, Ph.D., P.E. University of South Florida
Time:	Registration Begins 7:30 AM Seminar: 8:00AM - noon	Cost:	\$ 100 Members, \$ 150 Non-Members
Location:	Sand Pearl Resort 500 Mandalay Avenue Clearwater, Florida 33767 http://www.sandpearl.com/		
CEH Credits:	4 Continuing Education Hours will be awarded. Be sure to provide your name and PE number as it appears on your license. IEEE Florida Provider Number 3849.		
RSVP:	Ray Trusik, Florida Electrical Cooperatives Association 850-877-6166 Ext. 5 rtrusik@fecacom		

Seminar Description

Many electric utilities are embarking on programs to reduce electric losses on their systems, both as a measure of energy conservation and as an alternate to adding system capacity. Because a majority of the losses occur in the distribution system, most of these programs focus on reducing distribution system losses. Significant reduction in distribution losses is possible and economically justifiable.

Analytical and optimization techniques, and a system approach to apply them, have been developed to help attain the loss reduction. This seminar focuses on these loss reduction techniques, as well as methods for improving and coordinating the planning, design, and operation of the distribution system. Methods for economic selection of individual system components, such as conductors and transformers, are also discussed. This seminar also reviews the basic loss calculations and analysis tools.



Outline:

- I. Introduction
- II. Loss Calculation
- III. Economic Analysis
- IV. Loss Reduction Techniques
- V. Transformers
- VI. Implementation Strategies
- VII. Summary / Conclusion



Speaker Biography

Ralph Fehr, Ph.D., P.E. – University of South Florida. Ralph is an instructor in the Electrical Engineering department, teaching courses in the Power and Energy option as well as circuits, electromagnetics, and engineering mathematics. He is a senior member of IEEE, and received the IEEE FWCS PES Chapter Outstanding Engineer award in 2014, the Region 3 Joseph M. Biedenbach Outstanding Engineering Educator award in 2011, the Florida Council Outstanding Engineering Educator award in 2009, and the T&D World Instructor of the Month recognition in November 2008.



Date: Tuesday, June 14, 2016 Host: Steve Penland, VP of Operations
Great Bay Distributors

Time: 4:00 PM—6:00 PM

Location: 2750 Eagle Ave North Cost: Free for Members and Students
St. Petersburg, FL 33716 \$5 non-members
Make checks payable to IEEE FWCS, and mail to
Jim Howard
IEEE FWCS Treasurer
3133 W. Paris St.
Tampa, FL 33614

Questions: Claude Pitts
(727) 418-5272
claude.pitts@ieee.org

RSVP: Online at <http://time2meet.com/fwcs-pes2/index.html>
Space limited to first 25 registrants!!!

As an independent family owned business, Great Bay was founded by Claude and Nina Focardi January 1, 1968. Great Bay continues to operate as a privately held independent family business to this day. Great Bay impacts both the state and local economy through event sponsorships, charity involvement, Florida beverage taxes, employee benefits, payroll, other services contracted to support Great Bay's mission. In 2015, Great Bay Distributors paid the state of Florida over \$14 million in beverage tax. Great Bay's payroll for 350 employees in 2015 was over \$15 million, not including an additional \$5.8 million in employee benefits.

Great Bay has two locations in the Tampa Bay region. Their corporate office and warehouse at 2750 Eagle Ave North, St. Petersburg, FL 33716, and a sales office/warehouse at 3221 Grand Blvd, Holiday, FL 34690. Their Holiday location is over 102,000 SF and is approximately 40% of Great Bay's 11,251,928 cases sold moves through the Holiday warehouse. On June 1st, 2015, Great Bay closed its Largo facility and moved into its new St. Petersburg location. With an ever expanding portfolio, Great Bay had run out of space to operate efficiently from the Largo facility. A crown jewel of the new building includes, at the time of move in, Florida's largest private solar array at 1.5MW consisting of 4950 solar panels on the roof of this 200,000SF warehouse. It is estimated that this solar array will produce enough power to offset 90% of Great Bay's power needs.

Please join us as we tour the Great Bay St. Petersburg Facility and see how technology has been leveraged to sell over 11 million cases of beer, wine and non-alcoholic beverages in 2015.

Website: www.greatbaybud.com

Facebook: Great Bay Distributors

Twitter: @GreatBayDist

		
<h2>Distributed Resources—Operation, Protection, and Control</h2>		

Date: Friday, July 29, 2016 **Speaker:** Wayne Hartmann
VP, Protection and Smart Grid Solutions
Beckwith Electric

Time: Registration & Breakfast: 8:30 AM—9:00 AM
Seminar: 9:00AM — 2:00 PM **Cost:** \$ 100 Members, \$ 200 Non-Members, \$20 Students
Includes Breakfast and Lunch

Location: FRCC
3000 Bayport Dr. #600
Tampa, FL 33607 **Parking:** Use Hyatt parking lot (north side only)

CEH Credits: Continuing Education Hours will be awarded. Be sure to provide your name and PE number as it appears on your license. IEEE Florida Provider Number 3849.

RSVP: Online at <http://time2meet.com/fwcs-pes1/index.html>
Make checks payable to: IEEE FWCS Send checks to: Jim Howard, IEEE FWCS Treasurer
Space limited to first 45 registrants!!! 3133 W. Paris Street, Tampa, FL 33614-5964

Questions: Serge Beuzile at 863-834-6511, or serge.beuzile@ieee.org

Seminar Description

Distributed Electric Resources (DER) are making larger inroads into our distribution systems. This technical session provides a background into DER operation and associated protection and control considerations for conventional and inverter-based power sources. We will review types of DER/DG and the modes in which they can operate in parallel with the distribution system. Key aspects of IEEE 1547 and a sample DER interconnection screening process are highlighted. Details of on-site standby power system conversion to operate in parallel with the distribution system are shown. Protection methodology at the point-of-common coupling (PCC) and point-of-interconnection (PI) is detailed for all types of DER. A treatment of distribution system protection and control considerations and applications with DER is discussed, including addressing the impact of IEEE 1547A.

Speaker Biography

Wayne Hartmann is VP, Protection and Smart Grid for Beckwith Electric. He provides customer and industry linkage to Beckwith Electric's solutions, contributing expertise for application engineering, training and product development. Before joining Beckwith Electric, Wayne performed in application, sales and marketing management capacities with PowerSecure, General Electric, Siemens Power T&D and Alstom T&D. During the course of Wayne's participation in the industry, his focus has been on the application of protection and control systems for electrical generation, transmission, distribution, and distributed energy resources.

Wayne is very active in the IEEE as a Senior Member and serving as a Main Committee Member of the IEEE Power System Relaying Committee for 25 years. He is presently chairing the "Investigation of the Criteria for the Transfer of Motor Buses" Working Group. His IEEE tenure includes having chaired the Rotating Machinery Protection Subcommittee ('07-'10), contributing to numerous standards, guides, transactions, reports and tutorials, and teaching at the T&D Conference and various local PES and IAS chapters. He has authored and presented numerous technical papers and contributed to McGraw-Hill's "Standard Handbook of Power Plant Engineering, 2nd Ed."

USF DfX Lab Tour

May 10 tour showcased state-of-the-art technology

May 10 was a quiet Tuesday afternoon on the University of South Florida's Tampa campus. Final exams ended four days before, and spring commencement exercises just took place over the past weekend. But in Glenn Burdick Hall, the school's main engineering building, FWCS members were shown an impressive variety of technology available to USF students in the college's *Design for X* open-use maker space made possible by grants from Mini-Circuits and the Harvey Kaylie Foundation. Dr. Michael Celestin, senior research engineer for the USF College of Engineering, started the afternoon with a tour of the *DfX* lab, showcasing the 3-D printers, laser cutter, PCB mill, and electronics test benches available to all USF students after they complete an orientation and training sessions. An in-depth look at 3-D printing technologies and methods followed, culminating with a chance to inspect and handle many of the student-designed objects printed in the lab. A full-motion miniature piston-cylinder-crankshaft model, designed and printed by Dr. Celestin, was provided to each attendee as a souvenir. Dr. Celestin can be reached at mcelesti@usf.edu.



After the *DfX* tour, Robert Tufts, Assistant Director of the Nanotechnology Research and Education Center (NREC), conducted a tour of that facility, which contains state-of-the-art technology for fabricating, measuring, and



NREC Cleanroom Facility

testing components on the nanometer scale. In addition to an atomic force microscope, metrology and wet chemistry cleanrooms, focused ion beam, furnace and plasma tools, and thin film deposition equipment, Hitachi S-800 and SU70 scanning electron microscopes and a Tecnai F20 transmission electron microscope impressed the attendees by being able to display a lattice of individual gold atoms. In operation for 10 years, the NREC is available for student research as well as to the scientific community at large. Mr. Tufts can be reached at tufts@usf.edu.

In addition to an atomic force microscope, metrology and wet chemistry cleanrooms, focused ion beam, furnace and plasma tools, and thin film deposition equipment, Hitachi S-800 and SU70 scanning electron microscopes and a Tecnai F20 transmission electron microscope impressed



Tecnai F20 Transmission Electron Microscope

And a thank you to Dr. Ralph Fehr of the USF Electrical Engineering department for helping to arrange the tours. Dr. Fehr can be reached at r.fehr@ieee.org.

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Power Engineering Training and Consulting

Power System Analysis: 8 Sessions @ 3 hours per session for 2.4 CEU's [or 24 PDH's]

This course, designed for engineers and technicians, focuses on the use of symmetrical components to analyze unbalanced power systems. It covers the essential topics necessary for power system analysis including:

- Phasors and Complex Number Mathematics
- Three-Phase Power Calculations
- Per-Unit System
- Delta-Wye Transformer Analysis
- Symmetrical Component Theory
- Sequence Network Development
- Short-Circuit Fault Calculations
- Open-Circuit Fault Calculations

Fault Current Calculations:

4 Sessions @ 3 hours per session for 1.2 CEU's [or 12 PDH's]

This course is intended for engineers and technicians familiar with basic three-phase system analysis methods seeking a more thorough understanding of symmetrical components and sequence networks. A thorough development of symmetrical components, necessary for a thorough understanding of fault calculations, is presented. Then, a failsafe method of creating sequence networks is covered, followed by short- and open-circuit fault calculation methods.

Transformer Application: 4 Sessions @ 3 hours per session for 1.2 CEU's [or 12 PDH's]

This course begins with a review of basic transformer theory, then progresses to the analysis of a single-phase transformer using a detailed circuit model. Next, the basic three-phase transformer connections (delta and wye) are studied, followed by an overview of special transformer connections including high-phase order applications, grounding transformers, phase shifting transformers, and autotransformers.

AC Motor Application: 4 Sessions @ 3 hours per session for 1.2 CEU's [or 12 PDH's]

This course covers the essentials of induction motor application, including a review of basic motor theory, motor nameplate interpretation, speed-torque curves, and starting time calculations. NEMA frame sizes and NEMA starters will be addressed, along with motor and motor circuit protection practices as stipulated by the National Electrical Code. Motor control and special starting methods will also be covered. In addition, use of variable frequency drives (VFDs) will be discussed, along with concerns involving VFDs that need to be understood when working with power electronic technology.

Other Electrical Power Topics

Power System Planning Strategies and Techniques

Asset Management and Maintenance Strategies

Power System Modernization Methods

Power Engineering for Non-Power Engineers — *this course is ideal for engineers new to the power field who did not have a strong power background at the university. It is also helpful for technicians new to the power engineering field.*

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FE and PE Review courses for electrical power engineering

Contact Richard Heinze for additional information:

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Or fax your address changes to (732) 562-5445

June 2016 Calendar of Events (For more information see P. 1) *in this Signal...*

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