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THE SUNCOAST SIGNAL

THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.

Volume 52 — No. 3 **http://www.ieee.org/fwcs** **March 2009**

Inside this Signal…

This Month's Meetings

March 3rd: EXCOM Meeting

Meeting starts at 5:30PM At TECO Plaza
Register online at http://time2meet.com/fwcs-excom/index.html
Meeting is open to all FWCS members and guests

IEEE Standard 241 Color Book Seminar

Date: March 27, 2009
Time: 9AM to 4PM
Location: Seminole Electric Company
See page 6

Upcoming Events!

Joint PACE PES/IAS Event This Month

Speaker: Filipe Manteiga, State Department Consultant
Time and Date to be Announced
See page 8

IEEE-RFID 2009, Orlando

Date: April 27-28, 2009
Location: Disney World, Orlando
See page 9

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This Month… (Editor's Column)

Well, the Engineering Week Banquet is now history and it did not disappoint. There were 375 engineers in attendance of this event. Dr. Jim Anderson, FWCS Chair was the Master of Ceremonies and AnnMarie Spexet was the Keynote Speaker. She spoke about Engineers Without Borders and what they are doing around the world to bring clean water, power and sanitation to developing nations. The FWCS was well represented in the awards portion of the event. There is an article and accompanying photos on page seven. There are articles by Jim Anderson and Leland LaPoint in this issue. I had to postpone running these articles due to the number of events last month. There are several events of interest this month. First is the IEEE Standard 241 Color Book Seminar. Details are on page six.

Also this month is a presentation by Filipe Manteiga and his topic is rebuilding power grids in third world countries. He is formerly of the State Department and is currently a consultant to them, acting as a Project Manager. The time, date and location is to be determined and will be sent out by e-mail to the FWCS.

This issue marks my first year as Signal Editor. It has truly been a learning experience and a challenge to meet deadlines and be accurate and informative. I am hoping that next year will be as rewarding as the last!

Teacher In Service

Dear Friends,

Happy Engineering week! A big congratulation to the Lignell Winners around the Tampa Bay Area. The following were awarded at the Engineering Banquet held in Tampa on February 20th: **Linda Davies, ldavies@pasco.k12.fl.us, of Land O'Lakes High School (PASCO COUNTY), Karen Hogan, hogank@pcsb.org, of Palm Harbor University High (PINELLAS COUNTY), and Sandra Kinter, Sandra.kinter@sdhc.k12.fl.us, of Spoto High School (HILLSBOROUGH COUNTY**).

The following are upcoming science fairs: Hillsborough County's regional Science fair will be at the USF Sun Dome for all grades K-12 on February 25-26, 2009. The state Science fair will return to the Lakeland Center on April 15th through the 17th. Please register at www.floridassef.net to register online. Pasco's Elementary Young Scientists Fair on Saturday April 18, 2009 at Wesley Chapel High School Complex and starting at 8:30AM (contact Laura Hill lhill@pasco.k12.fl.us for more info). IEEE's Ralph Painter is signed up to attend the Hillsborough Science Fair.

Sean Denny

IEEE

FWCS Life Members Activities

This is Robert M. (Bob) Franklin and I was recently appointed Chair of the Life Members Committee of the IEEE Florida West Cost Chapter ExCom.
We are now planning three or four Life Members Seminars for this year. Among the subjects under consideration are:

- ENERGY CRISES: Reality or Myth
- INTERNET: Past - Present - Future
- WATER CONSERVATION
- ELECTRIC CARS/Biofuel

The schedule for these Seminars will be published in your April SUNCOAST SIGNAL, and I plan to communicate with our Life Members by E-Mail as soon as the plans are finalized.

IEEE

Prepare for the NEW P.E. Exam Format

The University of South Florida and IEEE are pleased to announce an all-new web-based review course for the PE (Electrical - Power) exam. This course has been developed specifically for the new exam format (effective this April). The cost for the 10-session self-paced review course is $495. IEEE members receive a 10% discount. The course instructors are Ralph Fehr, Ph.D., P.E. and Tom Blair, P.E. Both instructors are Senior Members of the IEEE, are Professional Engineers, and offer over 45 years of experience in the power industry. To register for this comprehensive review seminar, please contact Ms. Sally Davis sdavis14@eng.usf.edu.

Session 1 – Circuit Analysis
- Three-Phase Circuits
- Per-Unit Analysis
- Phasor Diagrams
- Symmetrical Components and Fault Calculations

Session 2 – Devices and Power Electronics
- Battery Characteristics and Ratings
- Power Supplies
- Relays, Switches, and PLCs
- Variable-Speed Drives

Session 3 – Codes and Standards
- National Electrical Code (NEC)
- National Electrical Safety Code (NESC)
- Electric Shock and Burns

Session 4 –Measurement and Instrumentation
- Instrument Transformers
- Wattmeters
- VOM Metering
- Insulation Testing
- Ground Resistance Testing

Session 5 – Special Applications
- Lightning and Surge Protection
- Reliability
- Illumination Engineering
- Demand and Energy Management
- Engineering Economics

Session 6 – System Analysis
- Voltage Drop and Voltage Regulation
- Power Factor Correction
- Power Quality
- Grounding
- Transformer Connections
- Transmission Line Models

Session 7 – Power System Performance
- Power Flow
- Load Sharing
- Parallel Generators or Transformers
- Power System Stability

Session 8 – Protection
- Overview
- Overcurrent Protection
- Protective Relaying
- Protective Devices
- Coordination

Session 9 – Rotating Machines
- Synchronous Machines
- Induction Machines
- Generator / Motor Applications
- Equivalent Circuits
- Speed-Torque Characteristics
- Motor Starting

Session 10 – Electromagnetic Devices
- Transformers
- Reactors
- Testing

Brain Teaser Challenge Solution - December 2008

Butch Shadwell

While pondering interplanetary travel last month we got into a discussion of the solar wind and how the earth's magnetic field protects us. "Over most of the planet, these magnetic lines of force (the B field) run roughly parallel to the surface of the planet north to south, except at the magnetic poles where the lines of force originate and terminate. If a positively charged particle approached the earth from the sun, would it tend to be deflected to the east or the west?"

Can anyone say "Right Hand Rule"? I am afraid that I may have complicated the problem by referring to the lines of force going from north to south. The problem is that the magnetic poles of the planet are labeled backwards. That is, the north pole of the planet attracts the north pole of a bar magnet so it is in fact the south pole of the planetary magnet and the earth's lines of force are from geographic south to north.

F = qv X B The direction of the force vector is determined by taking the cross product of the velocity and magnetic B vectors, keeping in mind that the charge q is positive (just like Ben Franklin's current flow). The right hand rule applied gives us an F to the east. But I bet you already knew that.

Brain Teaser Challenge – January 2009

Have you ever wanted to be a tap dancer? I hadn't thought about it much until I saw Michael Flatley and his team in River Dance. It is literally poetry in motion. As I watched the show I could feel the Irish branch of my family tree swaying to the music.

Some of you may recall that I am a bit of a thespian. I have been in over 65 shows including 6 musicals. Though I have done a little tripping over the floor boards, I haven't ever done any tap. However, I have seen how they mike tap performances. They use a device known as a PZM or pressure zone microphone. This type of mike has a design that limits how much sound is generated by vibration or movement of the microphone assembly itself. There is a small pressure zone sensor that can pick up sounds that are carried from other directions than the mounting structure.

In a condenser microphone element if the increasing sound pressure increases the capacitance, what kind of voltage change is observed on the microphone element as a high pressure wave passes?

Reply to Butch Shadwell at b.shadwell@ieee.org (email), 904-223-4510 (fax), 904-223-4465 (v), 3308 Queen Palm Dr., Jacksonville, FL 32250-2328. (http://www.shadtechserv.com) The names of correct respondents may be mentioned in the solution column.

IEEE

IEEE-USA News

WASHINGTON (30 January 2009) -- IEEE-USA's great challenge in 2009 will be to live up to its motto, "**Building Careers & Shaping Public Policy.**"

"Never before in my memory have both of these tasks been as important as they are now," said Dr. Gordon W. Day, who became IEEE-USA president on New Year's Day. ***"Rarely have so many of our members been so concerned about the future of their careers, and rarely has a U.S. president been so committed to using technology to preserve our prosperity, keep us secure and protect our environment."***
In a recent letter to President Barack Obama (http://www.ieeeusa.org/policy/policy/2008/120508.pdf), Day strongly endorsed the president's strategy of making investments that will save or create jobs now and build a stronger America for the future

IEEE-USA's latest energy policy recommendations http://www.ieeeusa.org/policy/positions/energypolicy.pdf

Another recent position statement urges the government to help provide universal, affordable access to broadband data communications (http://www.ieeeusa.org/policy/positions/broadband.pdf

IEEE

IEEE Standard 241 - Recommended Practice for Electric Power Systems in Commercial Buildings

FWCS IEEE Color Book Seminar Series

Date: March 27, 2009
Time: 9AM-4PM
Speaker: Frederick Brockhurst, P.E.
Location: Executive Conference Room
Seminole Electric Company
16313 North Dale Mabry Highway
Tampa, Florida

Space is limited to 45

Cost: $125 IEEE Member / $155 IEEE Non member
Includes lunch.
RSVP: http://time2meet.com/fwcs-pes1/index.html
Make checks payable to: IEEE FWCS
Pay at the door or send checks to:
IEEE FWCS Treasurer
30612 Nickerson Loop
Wesley Chapel, FL 33543
Attn: Dr. Paul Schnitzler

Questions? Contact Jeff Basiaga at 813-541-5758 or jeff.basiaga@stantec.com

Your local IEEE PES/IAS chapter is offering this seminar on IEEE Std 241 - Recommended Practice for Electric Power Systems in Commercial Buildings (The Gray Book) as part of a series of seminars based on the IEEE Color Books.

Please come and benefit yourself and the industry with this excellent class – sellout attendance is key to continue bringing the color book guest speakers here to Tampa Bay.

The IEEE Gray Book provides extensive information on each of the various specialized subjects involved in planning the power system of a new or modernized commercial structure. This comprehensive source will alert the electrical engineer or designer to the many problems encountered in designing electrical systems for commercial buildings.
Extensive information is presented on many different aspects of electrical systems. Information is given on load requirements, voltage considerations, power sources, and distribution systems from the point of view of power distribution. Once power enters the commercial facility, other issues such as services, vaults, electrical equipment rooms, wiring systems, system protection and coordination, lighting, and electric space conditioning become pertinent, and are addressed. Additional issues associated with the commercial facility covered in the IEEE Gray Book include transportation, communication systems planning, facility automation, expansion, modernization, rehabilitation, special occupancy requirements, and energy management.

Speaker Bio: Frederick C. Brockhurst, P.E. is a Life Senior Member of the IEEE and has been actively involved with the Industry Applications Society since 1975. He joined the U. S. Air Force after graduating from high school in his home town of Parma, Ohio. He completed his BSEE, MSEE, and PhD degrees at University of Missouri – Columbia while serving in the Air Force. His final assignment was teaching at the Air Force Institute of Technology and doing research and development work for what became known as the Star Wars Program. Fred retired from the Air Force in 1981 and joined the faculty at Virginia Tech, then later joined the faculty at Rose-Hulman and moved to Terre Haute, IN. During his tenure at Rose-Hulman he was responsible for developing an electrical engineering curriculum that has become the model for the national accreditation of electrical engineering programs.

Since his retirement from Rose-Hulman in 2003, Fred has been operating Brockhurst Engineering, Inc. from his home in Terre Haute. The largest part of his practice is analysis of electrical safety (Arc-Flash hazard analysis) for industrial and commercial electric power systems.

Tampa Bay Engineering Week a Success!

The 2009 Tampa Bay Engineering Week banquet was held on Friday, February 20, 2009, at the Grand Hyatt Hotel in Tampa. Over 375 local engineers and guests attended this event which was held to celebrate engineering students, teachers, and professional engineers. The banquet was held during National Engineer's Week which ran from February 15-21 this year.

Your IEEE section awarded its 2008 "Engineer of the Year" award to Mr. Jim Lumia. Jim is currently the local IEEE Florida West Coast Section's Chairman for the joint chapters of the Computer Society and Aerospace & Electronic Systems. Nathan Quecan of USF was awarded Engineering Student of the Year.

The keynote speaker at this year's banquet was Ms. AnnMarie Spexet. AnnMarie has been involved with Engineers Without Borders for seven years and during that time she has traveled to many exotic locations such as India and South America in order to use her engineering skills to provide disadvantaged people with such necessities as clean drinking water and solar power. Her presentation explained the mission of EWB, its growth into the organization it is today and told the stories of several projects around the world and even in the US.

Once again the Master of Ceremonies for this year's banquet was none other than the Section's very own Chairman, Jim Anderson. Jim kept the meeting on track and amused the audience with personal stories with an “engineering twist”.

Lignell Award winners were Linda Davies for Land O’Lakes High School in Pasco County, Karen Hogan of Palm Harbor University High in Pinellas County and Sandra Kinter of Spoto High School in Hillsborough County. Below are a few pictures from the event.

Jim Anderson, Master of Ceremonies

Serge Beauzile presents Student Engineer of the Year to Nathan Quecan

Serge Beauzile Presents Engineer of the Year to Jim Lumia

Keynote Speaker AnnMarie Spexet

There will be more pictures from the Engineering Week Banquet next month!

IEEE

Retention, Retention, Retention

So you've finally built a great engineering team and now you can't sleep at night because you are worried that everyone is going to leave. Well guess what, you're probably right -- everyone will eventually leave; however, how fast they leave depends on you. The engineering field has a rich history of job hopping and even in today's lean times, this has not changed. Unfortunately it's your most valuable employees that will be most likely to hop because they have the talents & experience that your competition is looking for. What's an engineering manager to do?

Engineers are a unique breed. If they like what they are doing, they will stay. One of the first ways to ensure that this happens is to make sure that everyone's connected with the mission of the business. Note that this is easy to say, but can be very hard to do. The larger the firm, the more disconnected most workers feel. Please keep in mind that the mission of the business can never have anything to do with money (i.e. "Grow profits by 20 %") because unless you work in accounting, you can never get excited about that!

Next is to make sure that engineering management is open with the staff about business wins, losses, and hiring plans. When was the last time that you sat down with your staff and talked about where the company is going? For that matter, do you even know where the company is headed? If everyone feels as though they know what is going on, then they will better understand how their job is helping the company get there. Once again, please note that saying that you have an "open door" policy is really just so many words. Your actions will speak much louder than these words.

Promoting from within can be a key tool for getting folks to stick around. If everyone knows what a career path looks like at your company, then they will know where they stand and what their chances of moving up are. If you are constantly hiring from the outside to fill upper management positions, then the team will lose heart and move on.

Finally, be very careful when it comes to team building activities. Engineering staff are notorious for not wanting to participate in these events and if you are not careful, it could turn into something that looks like a scene from "The Office" TV show. Instead, creating a challenge that requires a team to work together in order to win a prize or reward that has visibility (big trophy displayed in the office) or has a clear social value (donation to a charity in their names) can make a lasting impression.

One of the things that makes an engineering department so valuable is its creativity ("innovation" in modern speak). If you use this same creativity to actively work to create an environment in which the engineering staff wants to keep working and looks forward to what comes next, then congratulations -- you've succeeded.

Jim Anderson

IEEE

Joint PACE and PES/IAS Event in March!

There will be a guest speaker in March for this event. His name is Filipe Manteiga and he is a former State Department Employee and is now working as a consultant to them. He has been Project Manager in Latin American countries for rebuilding their power grid after damage from hurricanes. The presentation will be more entertaining and educational rather than technical. He will talk about the difficulties working in Third World countries to rebuild power infrastructure. Dates and times are to be determined and the event details will be announced in the coming weeks via e-mail to the FWCS. Don’t miss this presentation!

IEEE

Laser Fusion

In the world of nuclear energy, there are two types of nuclear reactions that are created; fission and fusion. The easier, more common reaction used is nuclear fission. This is accomplished by splitting a heavy element, using a neutron, which releases lighter elements and additional neutrons. The additional neutrons are what create the chain reaction. During this process, large amounts of energy are created due to the loss of mass during the nuclear reaction. This is the beauty of nuclear energy. This mass is represented as energy through Einstein's mass-energy equivalence relationship, better known as $E=mc^2$. Nuclear fission must be created using heavy elements, such as Uranium, so to release energy. If light elements are used, then the fission reaction will have an inverse effect, thus absorbing energy. Where nuclear fission becomes a problem is in the creation of radioactive byproducts that have long half-lives and can be costly to dispose of. This is where nuclear fusion has the greater advantage.

Nuclear fusion is the process of fusing two light elements, such as Hydrogen, which will create a mass-energy conversion such as that in a nuclear fission reaction. The most common fusion reaction occurs between the Hydrogen isotopes, Deuterium and Tritium. Unlike nuclear fission, the byproducts of a fusion reaction are other light elements, such as Helium, which are relatively harmless. It is this very reaction that powers the Sun, which in turn powers our solar system and sustains life on this planet. However, like the Sun, extreme temperatures are needed to create and sustain a fusion reaction. This becomes an issue since the temperatures needed, in the range of millions of degrees Celsius, require large amounts of energy to sustain. Several methods have been researched over the years and many have failed to create more energy than what is needed to create the reaction. However, one promising method utilizes lasers to create and sustain a fusion reaction.

A process called Inertial Confinement Fusion (ICF) uses an energy amplification source to initiate a fusion reaction. This is achieved by first heating the fuel source and then compressing it. In the ICF process that uses lasers, the laser beams are targeted on a fuel pellet which will focus large amounts of energy on the outer shell of the pellet. The outer shell will then heat up until a plasma is created. The high temperature and density of the plasma will aid in the compression of the fuel pellet. This combination of high temperature plasma and compression will create temperatures, within the core of the fuel pellet, that are optimal for nuclear fusion. By sustaining the energy being pumped into the fuel source, the fusion reaction will continue until the fuel is spent. Also, the energy created by the reaction should be much larger than that needed to power the lasers. Being able to create and sustain a nuclear fusion reaction is a pivotal step in the evolution of science and engineering, by allowing scientists to observe a major force in our universe and engineers to manipulate it to create energy. In the future, the very reaction that powers our solar system will illuminate our homes.

Lealand W. LaPoint II
USF Electrical Engineering Undergraduate
"I have no special talent. I am only passionately curious. – Albert Einstein"
Leland is a past contributor to the Signal. The Editor

IEEE

IEEE RFID 2009, Orlando, FL, April 27-28, 2009

The 2009 International IEEE Conference on RFID addresses key topics and issues related to RF-based identification and communication systems, and will feature keynotes, presentations on technology advances and panel discussions on pressing topics. IEEE RFID 2009 is the third annual conference that brings together researchers and practitioners from both academia and industry to share research results and knowledge in the areas of RFID technologies, their supporting large-scale distributed information systems and their applications.

Once again co-located with the RFID Journal LIVE! 2009 tradeshow and conference, attendees and presenters alike benefit. Authors are invited to submit full 8-page papers in the IEEE conference format presenting new research related to the theory and practice of RF-based identification and communication systems. All submissions must describe original work not previously published or currently under review for publication in another conference or journal. To find out more about the topics to be discussed go to the link below.

For more information go to http://www.ieee-rfid.org/2009/

IEEE

March 2009 Calendar of Events (For more information see P. 1) *inside this Signal…*

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3 *EXCOM Meeting at TECO See page 1*	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27 *IEEE Standard 241 Seminar page 6*	28
29	30	31	1	2	3	4

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