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THE SUNCOAST SIGNAL

THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.

http://ewh.ieee.org/r3/floridawc | Volume 47 - No. 8 | August 2004

Ultra-wideband and Impulse Radio for Secure Wireless Communications

IEEE COMMUNICATIONS SOCIETY

Raytheon

Date/Time: Thursday, 12 August 2004, 6PM
Location: Raytheon Company,
1501 72nd Street North,
St. Petersburg, FL
Speaker: Dr. Huseyin Arslan, USF

IEEE Signal Processing Society

Joint SP/COMM Chapter Meeting

Abstract: The high demand for communications anywhere and anytime has been the driving force for the development of wireless services and technologies. Wireless technologies and wireless services have evolved significantly over the last couple of decades, from simple paging to real-time voice communication and recently to very high rate data communications. With the number of users and services increasing along with the demand for high data rate, wireless communication systems need to deploy more efficient methods for communications, as the currently available spectrum is becoming congested and are very expensive to lease. Impulse radio (IR) based or known as ultra-wideband (UWB) is becoming an attractive solution for wireless communications, particularly for short and medium range applications. The wide bandwidth of UWB offers a capacity much higher than the current relatively narrow band systems.

Brief Biography: Dr. Arslan has received his PhD. degree in 1998 from Southern Methodist University (SMU), Dallas, TX. From January 1998 to August 2002, he was with the research group of Ericsson Inc. at RTP, NC. In Ericsson, he was involved with several projects related to 2G and 3G wireless cellular communication systems. His research interests are related to advanced signal processing techniques at the physical layer, with cross-layer design for networking adaptivity and Quality of Service (QoS) control. More specifically, he is interested in signal processing techniques for wireless communication systems including modulation and coding, interference cancellation and multi-user signal detection, channel estimation and tracking, equalization, soft information generation, adaptive receiver and transmission technologies etc. He is interested in many forms of wireless technologies including cellular, wireless LAN, Bluetooth, fixed wireless access, and specialized wireless data networks like wireless telemetry, wireless sensors, and wireless telemetry.

Continued on Page 6

Inside this issue of the Suncoast Signal..

THE SUNCOAST SIGNAL is published monthly by the Florida West Coast Section (FWCS) of the Institute of Electrical and Electronics Engineers, Inc. (IEEE). THE SUNCOAST SIGNAL is sent each month to members of the IEEE on Florida's West Coast. Annual subscription is included in the IEEE membership dues.

All material for THE SUNCOAST SIGNAL is due by **7th day** of the month preceding the issue month. Address all correspondence to:

Prof. Srinivas Katkoori,
4202 E. Fowler Avenue, ENB 118, Tampa, FL 33620.
Voice: (813) 974-5737 Fax: (813) 974-5456
E-MAIL: katkoori@ieee.org

Chair's Comments

By John Conrad

Recently, I took a few moments to reflect on where our Section is today and where it is going. This was partly prompted by the fact that I have recently passed the halfway point of my second term as your Section Chair. As you know, towards the end of their term of office, all leaders start worrying about their legacy, even if no one else gives a hoot!.

I believe that our Section is strong and getting stronger. I am supported by an incredibly talented and dedicated team of volunteers who give countless hours of their time to the benefit of section members. The Section has a life of its own with self-motivated individuals putting on meetings & tours and publishing a newsletter with minimal guidance or influence by the EXCOM. Individual empowerment is alive and well.

As a section member you can typically choose to attend two, if not three, technical meetings each month learning about such diverse topics as Linear Power Amplifiers, Near Limit Finite Length Coding, or Advanced Concepts in Transformation Protection. Perhaps, you prefer facility tours, in which case, you might have enjoyed the Butterkrust Bakeries or the Bayside Power Station, or the In-line Baggage Screening equipment at the airport.

When you add in a couple of conferences, a couple of picnics, a banquet or two, and twelve entertaining EXCOM meetings there is plenty for everyone during the IEEE year in Tampa Bay. Yes, I am proud to be part of one of the most active sections in the region, if not in the nation, and I only see things getting even better in the future. Take advantage of all there is to offer from the willing volunteers of your Section.

2004 Review Seminars For PE Electrical & Computer and EIT / FE October 29 and 30 Examinations

These 13 and 10 week courses, respectively, give engineers the opportunity to review and prepare for the engineering licensure tests in this state. Sessions cover all expected topics on the exams. Questions, problems, and scenarios give the students a chance to review, learn, and excel when taking the tests. All classes are archived on the FEEDS website for the entire duration of the sessions. The EIT/FE Review Seminar runs 10 weeks, from August 2 - October 11. Cost: $395. The PE Electrical Review Seminar runs 13 weeks, from July 22 - October 14. Cost: $395.

To register, contact: Edward Scott, P.E., PO Box 14042, (EC37), St Pete, FL 33733.
Edward.Scott@pgnmail.com
Phone (727) 384-7544, FAX (727) 384-7865
Pinellas Chapter, FL Engineering Society

FLORIDA CONSTRUCTION USERS ROUNDTABLE MEETING

10:00am-5:00pm, Thursday, 12 AUGUST 2004
LAKELAND, FLORIDA

The Florida Construction Users Roundtable (formerly the Florida Business Roundtable) is an autonomous, not for profit organization that provides a forum for the exchange of information, views, practices, policies, and business opportunities from a variety of construction users and technical services and construction providers engaged in business in Florida and other states in the southeast. It's goal is to provide professional networking opportunities and valuable information on legislation, safety, training, worker qualifications and technology. Our August 12 meeting has an exciting agenda which includes:

- All Requirements Generation Projects-Florida Municipal Power Authority
- The Promising Future of New Nuclear Generation-Entergy
- Jump Start Program-Raising the Bar on Training – RAMS
- Fully Integrated and Automated Life Cycle Management Technology - FIATECH

If you would like to attend please call for details: Patrick Duffy Tampa Electric 813-228-1765 or Gene Zakis sargent & Lundy 727-578-2500

Engineers Night at The Ballpark

Date: Saturday 7th August 2004
Time: 6:15 PM
Speaker: TBD.
Cost: Outfield Tickets $15 ea.
Questions: Contact Tom Blair 813-228-1111, ext 34407
thblair@tecoenergy.com
RSVP: Online at www.weiquality.com/fwcs-meetings

Go Rays!

IEEE FWCS Wins IEEE EAB Section Professional Development Award!!

On 19 June 2004 the IEEE Educational Activities Board (EAB) voted to recognize the Florida West Coast Section "*for major contributions to life-long learning, continuing education and professional development through sponsorship of Section/Society Meetings, Seminars, Workshops & International Conferences*" by awarding the Florida West Coast Section **the IEEE Educational Activities Board Section Professional Development Award**.

This award was established by the EAB to recognize IEEE Sections for major contributions to IEEE members in the areas of life-long learning, continuing education, and professional development. The 2004 IEEE EAB Awards will be presented during the IEEE Board of Directors Meeting Series in San Antonio, TX, USA. The presentation ceremony will be held on 19 November 2004.

Joint Chapter Meeting: IEEE Power Engineering Society/Industry Applications Society

Hybrid Car Technology in 2004

Mr. David Wright

Supervisor, Stadium Toyota

Date/Time: Wednesday, 25 August 2004 at 6:00 PM
Location: Doubletree Hotel, 4500 W Cypress St, Tampa
Cost: Members & Students $5.00, Guests $10.00
Very light refreshments are included.

Abstract: **"**Gas prices have eased up slightly. With the reprieve in prices at the pump, interest in hybrid cars has apparently softened. It looks like Americans, who use ten times more gasoline per capita than the world average, are once again ignoring the grave environmental and geo-political risks associated with oil addiction. Industry analysts predict that it will take gas prices sustained above three dollars a gallon before hybrid cars jump above the one or two-percent mark, in terms of new car sales. So, for the time being, cost-conscious consumers whose interest in hybrids rested solely with saving money at the pump have returned to their gas-guzzlers. Only the enlightened forward-thinking drivers who take a modicum of responsibility for their energy consumption—and who understand how fun it is to drive the most technologically advanced cars available—are still in the hybrid game. That's okay. Hybrid car drivers, documented to be the most educated car-buying segment, will be well prepared when gas prices spike up again next week, next month, or later this year." – ***hybridcars.com***

In response to the great interest in hybrid car technology David Wright will be presenting an overview of this technology, including a short video. He will also share his first hand experience in maintaining hybrid cars as Supervisor of Technicians for Hybrid Cars at Stadium Toyota.

It is always easier to understand a topic when there are visual aids, so if you own a hybrid car and would be prepared to bring it to the meeting or just share your experiences, please contact me at (813) 926-4004 or john.conrad@ieee.org.

Reservations: Please make reservations on-line: **www.weiquality.com/fwcs-meetings** or contact John Conrad, Chair, Florida West Coast Section, **john.conrad@ieee.org (**813) 926-4004.

Directions: Exit I-275 via ramp at "40B Lois Ave." Turn North on to North Lois Ave and almost immediately turn left on West Cypress Street and go West for 0.3 miles and the hotel is on the left-hand side.

USF Providing Engineers with Educational Opportunities

By Tom Blair

It is imperative for today's engineers to maintain and enhance their professional excellence. For the busy engineer who would like to pursue a Masters Degree in Electrical Engineering, the University of South Florida (USF) has a growing Power Systems graduate engineering program. Many of the courses are offered as evening classes to allow busy engineers to pursue their Masters Degree in the evenings. Some of the power oriented courses that USF offers are **Electric Machines and Drives, Energy Management Systems, Industrial Power Distribution, Power Electronics, Power Quality, Power System Analysis, Power System Protection**, and **Utility Distribution Systems.** Courses currently scheduled to be offered in the Fall 2004 are Industrial Power Distribution, Power Electronics, and Power Systems Analysis I. In addition, many of the power courses are offered through the Florida Engineering Education Delivery System (FEEDS).

Since 1983, the FEEDS program has been providing access to graduate and undergraduate level engineering courses, certificates, and review seminars. Corporate sites, university centers, and the web are just a few of the venues that FEEDS can accommodate. The FEEDS system provides a new kind of university experience for engineers while preserving traditional requirements, rigor, and academic excellence. Over 1,000 graduate and undergraduate engineering degrees have been granted from the college's academic departments through FEEDS distribution. Additionally, the Electrical Engineering Department offers professional development hour (PDH) credits in electrical engineering subjects such as **Supplemental Over-current Protection** and **Symmetrical Component Calculations** for continuing education credits.

For more information on starting on the path to a Masters Degree in Electrical Engineering or for more information on the continuing education program, you can visit the USF College of Engineering, Power Systems Program website at http://web.tampabay.rr.com/usfpower/ or you can email **Professor Ralph Fehr III, P.E.** at r.fehr@ieee.org

BECKWITH ELECTRIC CO. INC.

Beckwith Electric Protection Seminar
September 26-30, 2004
Radisson Hotel, St. Petersburg, Florida

Now, more than ever, is the time to learn how to improve the security and dependability of generator, transformer, and distributed generation (DG) interconnection electrical protection in both utility and non-utility applications. Since the blackout of August 2003, these topics are in the forefront as the industry attempts to improve asset security, preserve power delivery, and boost the integrity of the bulk power system.

Beckwith Electric's annual Protection Seminar, in an intensive four days, provides the background you need to understand the complex subjects of generator, transformer and distributed generator (DG) interconnection protection, even if you have a limited knowledge of power system protection standards and practice.

Earn 2.8 CEUs through IEEE, Inc.!
Sponsored by IEEE PES Florida West Coast Chapter

Why attend?
Generators and transformers need to be protected from internal faults, as well as abnormal operating conditions brought about by the bulk power system. When subjected to these events, a failure of the asset can occur within seconds, requiring dedicated protection schemes for detection and clearing. The standards for protecting these assets are changing, thereby increasing the protection requirements.

Distributed generation places special challenges on the DG's interconnection protection, the DG's generator protection, and the utility's distribution protection. To effectively provide interconnection protection, protective functions for anti-islanding, faults, and abnormal operating conditions must be selected. Consideration is given to individual utility standards and the new IEEE 1547 standard.

Who should attend?
Utility engineers, consultants (especially those involved with IPP/DG design), equipment/control engineers, generator packager, and manufacturer engineers as well as others who specify protective equipment and develop settings for the electrical protection of generators, transformers, and DG interconnections.

Instructors

- Dr. Murty V.V.S. Yalla, VP of Research and Development/Engineering for Beckwith Electric.
- Charles (Chuck) Mozina, consultant for Beckwith Electric specializing in system protection.
- Clark Shaughnessy, Customer Technical Support Manager of Beckwith Electric.
- Wayne Hartmann, Marketing Manager & Business Unit Manager, Protection, for Beckwith Electric.

SEMINAR FEE: $800 by 8/10/04
15% group discount for 3+ attendees from same company—$595 per person.

Fee includes course materials, lunches, a.m./p.m. breaks, two dinners, and Sunday evening welcome reception. Seminar to be held at Radisson Hotel.
Registration deadline is Tuesday, August 10.

Hotel Accommodations:
Radisson Hotel-St. Petersburg
12600 Roosevelt Boulevard
St. Petersburg, FL 33716
(727) 572-7800 or 1-800-333-3333
Fax: (727) 572-5700
Room Rate: $109.00 for single or double rooms.
(Mention Beckwith Electric to receive special rate.)
Reservations Cut-Off Date: August 10, 2004

Registration:
Name:
_____
Organization:
_____
Address:
_____
City:
_____
State: Zip:
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Daytime phone # _____
Fax # _____
E-mail: _____

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Check enclosed (payable to Beckwith Electric)

Purchase Order #_____

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Cardholder's Name_____
Signature_____

Fax completed registration form to (727) 546-0121

For Additional Info: contact Linda Caporaso at (727) 544-2326 or lcaporaso@beckwithelectric.com, or download the Protection Seminar brochure at *www.beckwithelectric.com*

Seminar Advance Notice

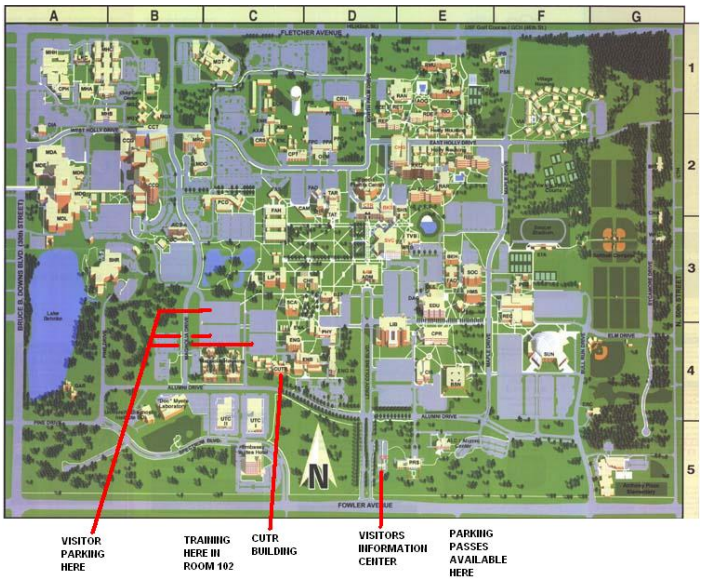
Automated Residual Bus Transfer

Date:	Monday, 20 September 2004
Time:	Registration and Breakfast 7:30 AM - 8:00 AM Session - 8:00 AM - 12:00 PM
Speaker:	**Jim Bowen, PE,** Technical Director, Powell Electrical Mfg. Co.,
Location:	University of South Florida, College of Engineering CUTR building, Room 102 4202 E. Fowler Avenue, Tampa, FL 33620

Parking Permits available at Visitors Information area at main entrance.
Space is limited to 40 people so please sign up early.

PDH Credit:	There will be (4) four PDH Hours credited for this training. Be sure to include your license number and your name as it appears on your license with your reservation. Florida provider number EXP 00015.
Cost:	Members, $100; Non-members, $150, Student Member $25 Please send payment in advance to: IEEE - FWCS 648 Timber Pond Drive Brandon, FL 33510-2937
RSVP:	Online at: http://www.ewh.ieee.org/r3/floridawc/
Questions:	Tom Blair at 813-228-1111, ext 34407 or thblair@tecoenergy.com

This class begins by providing a thorough discussion of a traditional residual bus transfer scheme. This includes a review of the logic scheme necessary to ensure an automatic transfer. A relay coordination commentary provides guidance for minimizing transfer time. The discussions describe additional coordination concerns when downstream feeder breakers and upstream source breakers are considered. A procedure for plotting under-voltage relay characteristics on time-over current coordination curves is also provided. Reaccelerating rotating motors with internal residual voltage is reviewed to illustrate safe equipment practice and control of machine torque within acceptable NEMA MG-1 limits. Modern control equipment advantages and disadvantages are compared with the traditional discrete device residual bus transfer system.



Mr. Bowen has 18 years experience with Exxon where he worked in all facets of Electrical Engineering involved with the petrochemical process. He had responsibilities on several large projects including Co-generation, High Voltage Gas Insulated Switchgear, large variable speed drivers, and various other grass-root projects. He also held the post of the Regional Engineer for Exxon Chemicals Europe for three years.

At Powell Electrical Manufacturing Company, Jim holds the post of Technical Director. As Technical Director, he provides leadership, training and mentoring in the utilization of equipment rated 38 kV and below. He authors the Powell Technical Briefs, a popular 1 to 3 page article, addressing technical problems commonly found in the Electrical Power work place.

June 21 Tour of Bayside Power Station

By Tom Blair

IEEE Power Engineering Society hosted a tour of the Tampa Electric Bayside Power Station on Monday, June 21 and we had over 40 attendees. Attendees had a chance to see the control room, one of the new combustion turbine generators, an associated heat recovery steam generator, the station service system, and the new plant remote telemetry system. In addition there was a presentation of some of the construction and engineering issues involved in building new generation on an existing site and still maintaining existing generation to service customer load requirements. Bayside consists of 7 combustion turbines and associated heat recovery steam generators that feed two steam turbine generators for a total combined electrical generation capability of 1750MW.

Many thanks to the following volunteers that made the tour possible; Jim Badgerow, Ralph Painter, Chuck Walters, David Kiepke, and Bill Jordan. Without the support and dedication of our volunteers, opportunities like this would not be possible.

Keep watching your Signal for more upcoming tours and events. If your company would be interested in hosting an IEEE sponsored tour, you can contact any of the IEEE Executive committee members as listed on page 2 of this newsletter.

Joint SP/COMM Seminar: Ultra-wideband and Impulse Radio…

Continued from Page 1

Conventional wireless communication systems employ radio frequency (RF) carriers of much higher frequency than the information rate to transmit base-band signals. UWB is a carrier-less (base-band) transmission. Therefore, it does not require the elaborate complex and expensive radio frequency (RF) up/down conversion used in conventional communication transceivers. The result is much simpler and less costly transceivers circuitry. Other benefits of UWB include immunity to multi-path effects, high resolution (sub-decimeter range), robustness against eavesdropping, and additional security due to its low probability of detection (LPD).

In this presentation, ultra-wideband technology for secure, low power, and high data rate wireless communication will be discussed. First, an overview of the technology along with applications, advantages, and research issues will be covered. Then, more focus on UWB digital receiver design including synchronization, channel estimation, correlator and rake reception, narrowband and multi-user interference cancellation as well as multi-access code design will be discussed.

Reservations: Please sign-up on line at **www.weiquality.com/fwcs-sp/** atleast 48 hours in advance if you are attending. If you are not a US citizen, a special approval will be needed to enter the building. Forms can be obtained by emailing Bror_W_Peterson@raytheon.com

Directions: From Tampa, take I-275 South to I-275 south across Tampa Bay to EXIT 12 (22nd Ave. N.) From Sarasota, take I-75 North to I-275 north over the Sunshine Skyway Bridge to Exit (22nd Ave. N.). Turn west on 22nd Ave. past Tyrone Mall to 72nd Street N. Turn left at the traffic light to the Engineering Building. Park in the lot farthest south of the complex. At the gate, there will be directions or an attendee that will guide you to the conference room.

Brain Teaser Challenge Column

By Butch Shadwell

July BTC As I write this, I have only received one answer to this BTC, and a very good answer it is too. To refresh your memory, last month I was telling you all about the Ansari X Prize for privately funded space travel. The thermocouple problem I described was; "we need to run each thermocouple cable from one end to the other to get the highest Seebeck voltage. The fact that these temperatures reverse during reentry doesn't really hurt our power generating ability. This month I just want readers to tell me some different metal combinations that function well as thermocouple materials?" Cesar Balladares sent me the following data:

- *Type K (Chromel (Ni-Cr alloy) / Alumel (Ni-Al alloy)) Type K is the 'general purpose' thermocouple. It is low cost and, owing to its popularity, it is available in a wide variety of probes. Thermocouples are available in the -200°C to +1200°C range. Sensitivity is approx 41uV/°C. Use type K unless you have a good reason not to.*
- *Type E (Chromel / Constantan (Cu-Ni alloy)) Type E has a high output (68uV/°C) which makes it well suited to low temperature (cryogenic) use. Another property is that it is non-magnetic.*
- *Type J (Iron / Constantan): Limited range (-40 to +750°C) makes type J less popular than type K. The main application is with old equipment that can not accept 'modern' thermocouples. J types should not be used above 760°C as an abrupt magnetic transformation will cause permanent decalibration.*
- *Type N (Nicrosil (Ni-Cr-Si alloy) / Nisil (Ni-Si alloy) High stability and resistance to high temperature oxidation makes type N suitable for high temperature measurements without the cost of platinum (B,R,S) types. Designed to be an 'improved' type K, it is becoming more popular.*
- *Type B (Platinum / Rhodium) Suited for high temperature measurements up to 1800°C. Unusually type B thermocouples (due to the shape of their temperature / voltage curve) give the same output at 0°C and 42°C. This makes them useless below 50°C.*
- *Type R (Platinum / Rhodium) Suited for high temperature measurements up to 1600°C. Low sensitivity (10uV/°C) and high cost makes them unsuitable for general purpose use.*
- *Type S (Platinum / Rhodium) Suited for high temperature measurements up to 1600°C. Low sensitivity (10uV/°C) and high cost makes them unsuitable for general purpose use. Due to its high stability type S is used as the standard of calibration for the melting point of gold (1064.43°C).*

But I bet you already knew that. Thanks Cesar.

August BTC Unlike many of you, people are always asking me, "Butch, how do you stay in such good shape and keep that youthful spring in your step?" I always reply as modestly as I can, that I owe it all to genetics and regular infusions of Dr. Pepper. You know … the carbonated soft drink. I really don't think that the cosmetic surgery and spa treatments I use are any different than anybody else's. But my wife and I can attest to the medicinal properties of Dr. Pepper. I'd be willing to bet we could end this debate over stem cell research if those scientists would give Dr. Pepper a proper trial. We've discovered many new uses for this amazing drink. Besides cleaning battery terminals, we also find it useful at softening one's cuticles before a manicure. George Washington Carver may have been the whiz with peanuts, but I'm going to outdo him with Dr. Pepper.

In one of my Pepper applications I needed to recover the power waveform of an acoustical signal, so I squared the waveform resulting in making it all positive instead of bipolar, and doubling the frequency. Then I put on a low pass filter. I know I should have it on the tip of my brain, but I can't remember the equation for the cross-over frequency of a simple one pole RC filter. If I want the knee (- 3db) at 5 Hz and the capacitor is 1 µF, what should my resistor be?

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 e mentioned in the solution.

Charles Concordia Leaves an Enduring Legacy to the IEEE Foundation?

By Karen Galuchie, IEEE Development Office

Charles Concordia was the engineers' engineer. Some will remember him as the engineer who was responsible for a multitude of technical advances and innovations in the field of power engineering. Others will remember the teacher, the man who took the time to help them break down a complex calculation until it was understood. Still others will remember him for his unwavering commitment to the profession.

It was probably a combination of these qualities and character traits that led Dr. Concordia to invest in the future of the profession by leaving a US$100,000 unrestricted legacy gift to the IEEE Foundation. This legacy gift serves as an enduring testimonial to Dr. Concordia's generosity and commitment to the profession. To show its gratitude, the IEEE Foundation has added Dr. Concordia's name to the roster of the Goldsmith League, our legacy giving recognition group.

When notified about this gift, IEEE Foundation President Emerson Pugh said, "The IEEE Foundation Board is honored that such a wonderful man and incredibly talented engineer has entrusted us with such a generous gift. This gift is an expression of Dr. Concordia's belief in the importance of our mission of furthering the scientific and educational purposes of the IEEE. We will strive to be worthy of his gift by funding philanthropic activities that will have a significant positive impact on the engineering profession now and well into the future."

To learn more about the IEEE Foundation, the philanthropic arm of the IEEE, visit us on the web at www.ieee.org/foundation. For a confidential discussion on how you can create an enduring legacy and invest in the future of the IEEE Foundation, please contact supportieee@ieee.org.

Want To Know More About Distribution Transformers?

Plan to Attend this Seminar and learn more about the why's and wherefores of Transformers:

When: Friday, September 24, 2004
Where: Lakeland Electric
Instructors: John Sullivan & Tim Badger
Pdh's Issues: Yes

Plan now to attend this outstanding presentation on Distribution Transformers.
Watch the next Signal for all the details, but be sure to mark your calendars now.

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Telephone Fax

2. Principal Job Function
(check only one)

- ☐ AA Engineer - Design
- ☐ AB Engineer - Manufacturing
- ☐ AC Engineer - Quality/Test
- ☐ AD Engineering Services
- ☐ AE Engineering Management
- ☐ AF Corporate/General Management
- ☐ AG Press
- ☐ AH Purchasing/Procurement
- ☐ AJ Marketing/Sales
- ☐ AK Student/Educator
- ☐ AL Other

3. What is the Primary End Product at this Location
(check only one)

- ☐ CA Communication Systems
- ☐ CB Components/Materials/ Hardware Supplies
- ☐ CC Computers/Systems and Sub-systems
- ☐ CD Consumer Products, Automotive & Appliances
- ☐ CE Contract Services-Design/ Manufacturing/Test/ IC Foundry etc.
- ☐ CF Controls
- ☐ CG Military/Government/ Avionics
- ☐ CH Medical Electronics
- ☐ CJ Semiconductors/ICs
- ☐ CK Test/Measurement/ Inspection
- ☐ CL Distributors
- ☐ CM Other

4. Product Interest - Which of the following do you specify, recommend, approve, purchase or influence the purchase of?
(check all that apply)

- ☐ BA ASICs, PLDs, FPGAs
- ☐ BB Board Level Products
- ☐ BC Semiconductors/ICs
- ☐ BD Components other than IC's
- ☐ BE Computers/Peripherals/ Software
- ☐ BF Contract Services - Design/Manufacturing/Test
- ☐ BG EDA Tools & Engineering Software
- ☐ BH Interconnection Devices
- ☐ BJ Laser & Electro-Optical Devices
- ☐ BK Microwave Components
- ☐ BL Packaging Hardware/ Enclosures
- ☐ BM Power Sources
- ☐ BN Production Equipment
- ☐ BP Production Tools & Supplies
- ☐ BQ Sensors & Transducers
- ☐ BR System Boards
- ☐ BS Test & Measurement Equipment
- ☐ BT Other

5. Years Involved in Industry

- ☐ DA 1 - 2
- ☐ DB 3 - 5
- ☐ DC 6 - 9
- ☐ DD 10 or more

How to Register

Mail Deadline - January 21, 2005
Southcon 2005
1514 First Street
Manhattan Beach, California 90266

FAX Deadline - February 11, 205
813-996-4460
Please do not both fax and mail

Electronically www.southcon.org
After January 21, 2005 badges will be held for pick-up at the Orange County Convention Center.

On-Site
Bring this form with you to Southcon/2005 for FREE admittance.

6. Size of your organization

	At Your Location	In Entire Company
1 - 49	☐ EA	☐ EB
50 - 99	☐ EC	☐ ED
100 - 499	☐ EE	☐ EF
500 - 999	☐ EG	☐ EH
1,000 or more	☐ EI	☐ EJ

- ☐ GA **I would like to receive show and conference updates via e-mail**
- ☐ GB **Send me complete Technical Program Information**

I am a member of (or referred by) ☐ IEEE ☐ ERA

Southcon®/2005
February 16-17, 2005
Orange County Convention Center
Orlando, Florida

Persons under 18 years of age not admitted. Students 18 or older admitted on Thursday, February 17, only.

Also, please register my colleagues: Express Registration Free Admission-Exhibits Only.

First Name _____
Last Name _____
Job Title _____
Mail Stop _____

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First Name _____
Last Name _____
Job Title _____
Mail Stop _____

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www.southcon.org **310-937-1006**

August 2004 Calendar of Events

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	**2**	**3** *5:30pm: IEEE FWCS Executive Committee Mtg., TECO Hall, Tampa*	**4**	**5**	**6**	**7**
8	**9**	**10**	**11**	**12** *6PM SP/COMM Mtg., Raytheon, St. Pete.* *10AM-5PM: Florida Constn. Users Mtg., Lakeland*	**13**	**14**
15	**16**	**17**	**18**	**19**	**20**	**21**
22	**23**	**24**	**25** *6PM: Joint PES/IAS Mtg., Hybrid Car Technology Tampa*	**26**	**27**	**28**
29	**30**	**31**				

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Florida West Coast Section
3133 W. Paris
Tampa, Florida 33614

Sections Congress 2005 is coming to Tampa!

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