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THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.

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Volume 47 - No. 4

April 2004

The IEEE I&CPS 2004 Conference is Coming to Clearwater!

## *Industrial & Commercial Power Systems Technical Conference - May 2-6, 2004*

**Sheraton Sand Key, Clearwater Beach, FL**

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Don't wait! Visit us on the WEB at [ieee.org/icps04](http://ieee.org/icps04) to register. You can also get conference details, a listing of the technical papers, details on both the tutorials being presented, and the conference's social functions.

This is an International Conference with attendees from around the world! Don't miss this once-in-a-lifetime opportunity for local IEEE members to attend a prestigious technical conference with no travel costs!

If your schedule doesn't permit you to attend the entire conference, then be sure to reserve Thursday, May 6 to attend one of the all-day Tutorials - Non-Members can get the member rate if they register for the conference.

**Generator, DG Utility Paralleling & Transformer Protection**, Sponsored by Beckwith Electric  
IEEE Member - \$75, Non-Member - \$100. Includes Lunch & Breaks.

**Power Quality Workshop**, Presented by Mark Halpin, Auburn University  
IEEE Member - \$50, Non-Member - \$75. Includes Lunch & Breaks.

**Important Note:** Both Tutorials qualify for PDH Continuing Education Credits toward Florida PE license renewal! For Tutorial Registration contact Richard Beatie: [r.beatie@ieee.org](mailto:r.beatie@ieee.org) or 813.289.0252.  
Credit Cards Accepted! *For Tutorial Details See Pages 4-5 ..*

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## Chair's Comments

By John Conrad



What is a chapter? What is the difference between a chapter and a section? What is a branch? What is the difference between a branch and a region?

I suspect that many of you are unable to answer to these questions. Yes, the old timers who have spent a working lifetime of involvement with IEEE probably can, but the average Joe probably doesn't know and probably doesn't care too much.

However I am going to enlighten you. After five minutes of research and I can give you the following information. (I apologize for some pretty dry statistics.)

The IEEE world is divided GEOGRAPHICALLY into regions. Regions 1 – 6 are in the US and Regions 7 – 10 cover the rest of the world. We live in Region 3. Each region is divided into sections, which vary in size, but usually serve members in a few counties. The Florida West Coast Section, FWCS, serves over 2,000 members in the 12 counties identified on the front page of this newsletter.

The IEEE is divided TECHNICALLY into 38 societies. A chapter is a group of society members in a section who get together to hold meetings of interest to their society members. Eight societies are represented in the FWCS by four joint chapters.

- 1) The 378 FWCS members of the Computer Society have a joint chapter with the 29 FWCS members of the Aerospace and Electronic Systems Society.
- 2) The 220 members of the Power Engineering Society have a joint chapter with the Industrial Applications Society.
- 4) The 154 members of the Communications Chapter have a joint chapter with the 44 members of the Signal Processing Society.
- 3) The 63 members of the Microwave Theory and Techniques Society have a joint chapter with the 30 members of the Antennas and Propagation Society and the 20 members of the Electron Devices Society.

The 36 members of the Circuits and Systems Society, the 31 members of the Women in Engineering Society, the 29 members of the Engineering in Medicine and Biology Society, and the 27 members of the Engineering Management Society are not represented by a local chapter. (Give me a call if any of you would like to form a local chapter. I would be happy to help you get started.)

For some reason when students organize themselves they get to be called student branches. The FWCS has a student branch at USF which has a Computer Society Chapter. (along with an inactive Power Engineering Chapter).

Don't you feel better now that you have all this information inside your head?

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## **Attention! Microwave & Wireless Engineers**

*It's not too late to register for the*

## **2004 Wireless and Microwave Technology Conference**

**April 15 – 16, 2004 at the Marriott Suites  
on Sand Key, Clearwater Beach**

*Details and on-line registration at:*  
[www.wami2004.org](http://www.wami2004.org)

## **One FWCS Member Elevated to IEEE Senior Membership**

Florida West Coast Section had one member elevated to senior membership during the February meeting.  
*Congratulations to the Jack C. Parker for his accomplishment.*

## **Presentation on LTC Transformer Paralleling & Tour of Beckwith Electric Facility**

*PES/IAS FWCS*

**Date:** Tuesday, 20<sup>th</sup> April 2004

**Speaker:** Tam Jauch

**Time:** 4:30 PM – 6PM

**Location:** Beckwith Electric

**Reservations:** <http://weiquality.com/fwcs-meetings/>  
or Call Ghaff Khazami at (813) 960 0990, E-mail  
[gkhazami@ieee.org](mailto:gkhazami@ieee.org)



### **Subject: Advanced paralleling of LTC Transformers by Delta VAR Methodology**

PES West Coast Chapter invites you to a tour of Beckwith Electric Facility; (Beckwith Electric is Manufacturer of Relay and control devices for power industry). After the tour, there will be a presentation on LTC Power Transformer Paralleling Applications. You will have the latest technical information and procedures in Paralleling large or small Distribution Transformers.

Paralleling Basics - LTC transformers or Transformer regulator combo /need for Paralleling Equipment / Result of inappropriate positions including the following concerns about paralleling:

Optional Methods - Master/follower / Negative Reactance / Power Factor / Circulating current/Delta VAR

Application problems - station breaker operations / separate sources / different KVA ratings / different impedances / impedance variation between taps / three winding transformers / tertiary loading / local generation

Connections - testing / settings / trouble shooting

**Speaker:** Tom Jauch, BE consultant; Graduate of Bradley University with over 35 years of experience serving electric power industry. Tom's previous positions were with Central Illinois Light Company and GE.

**Directions:** Beckwith address is 6190, 118 Ave. North Largo, FL. From I-275, over the HF Bridge, follow the exit signs to Largo.

## **USF Web Archives of Seminars on “Symmetrical Components for Power System Analysis” and “Overcurrent Protection of Distribution Systems”**

Because of an overwhelming response to the initial seminars held in March, the FEEDS department at the University of South Florida has web archived the latest in their continuing educational series. “Symmetrical Components for Power System Analysis” (2 CEU, 20 PDH) and “Overcurrent Protection of Distribution Systems” (2 CEU, 20 PDH) are now available at any time as webinars wherever there is a high-speed internet connection.

Targeted for power system engineers, analysts, system planners, and protection engineers, “Symmetrical Components for Power System Analysis” creates an environment to discuss the safety processes, concerns, and overcurrent issues, electrical engineers face day to day. Through discussion, lecture, and workshops, Ralph E. Fehr, III, P.E., (adjunct instructor at USF) explores the topic of symmetrical components and its applications. Beginning with a review of phasors and complex number mathematics, the seminar will integrate each topic to create the final methods of calculating open circuit fault current parameters.

“Overcurrent Protection of Distribution Systems” analyzes the topology of a conventional radial feeder distribution system followed by discussing the benefits and disadvantages of such process designs. The class then investigates distribution protection equipment and holds a discussion of the common application of each type of equipment. The course concludes by examining the effects of contingency backup, abnormal operating conditions, and cold-load pickup on protection coordination.

Ralph Fehr has 20 years of experience in the field of electrical engineering and has taught for over 15 years. He holds a BS with honors from Pennsylvania State University and an M.E. from the University of Colorado at Boulder. Working with such organizations as the Public Service Company of New Mexico, Florida Power, TECO, and the United States Air Force, Fehr is extremely qualified as an international consultant, an instructor at several universities around the country, and a professional engineer at numerous companies.

Once completed, the FEEDS department will mail a certificate of completion to each participant with an official statement of continuing education credits and professional development hours earned. For information on these webinars and the distribution of CEU and PDH credits, contact the University of South Florida’s FEEDS department at (813)974-3783 or log on to <http://feeds.eng.usf.edu>.

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### ***Industrial & Commercial Power Systems Conference Tutorials*** **Sheraton Sand Key, Clearwater, FL** **8:00am to 5:00pm - Thursday, May 6, 2004**

#### **➔ GENERATOR, DG UTILITY PARALLELING & TRANSFORMER PROTECTION**

*Wayne Hartmann, Marketing Manager and Dennis Adams, Sales Manager, Beckwith Electric, Clearwater FL*

**REGISTRATION: IEEE Member - \$75 Non-Member - \$100**

**Includes Lunch & Breaks**

#### **1. ADVANCED GENERATOR PROTECTION APPLICATIONS**

1. Protection recommendations per the IEEE "Buff" Book, ANSI C37.102, "Guide for the Protection of Synchronous Generators," and IEEE Tutorial for Generator Protection.
2. Impact of connection and grounding on protection applications.
3. Areas of upgrade using modern protection methods in concert with latest standards.
4. Unique element designs offering improved security, reliability, and asset preservation.
5. Review of setting and analysis software to increase productivity and decrease design and field engineering time.

## 2. DISTRIBUTED GENERATION (DG) PROTECTION

1. Definition of DG, evaluation of DG vs. generator protection, review of protection engineer challenges.
2. Interconnection types and impact of transformer arrangements, grounding & machine type.
3. Comparison of DG interconnection standards of various power companies & IEEE P-1547 national standard.
4. Distribution protection coordination issues and IEEE Power System Relay Committee distribution survey results of the impact of DG on protection practices.
5. Protection techniques for anti-islanding, abnormal operation conditions, fault back-feed removal and restoration.
6. Review of setting and analysis software to increase productivity and decrease design and field engineering time.

## 3. ADVANCED TRANSFORMER PROTECTION APPLICATIONS

1. Protection recommendations per the ANSI C37.91, "Guide for the Protection of Power Transformers"
2. Impact of connection and grounding of power transformer windings, CT circuit arrangement, on protection applications
3. Improvement of protection schemes through inclusion of additional primary and back-up zone elements to standards outlined in ANSI C37.91
4. Enhancement of security and reliability through advanced inrush and over-excitation restraint applications in Transformer Protection Relays for 2- and 3-winding applications
5. Review of setting and analysis software to increase productivity and decrease design and field engineering time

### ➔ POWER QUALITY WORKSHOP

[Mark Halpin, Auburn University]

**REGISTRATION: IEEE Member - \$50 Non-Member - \$75**

**Includes Lunch & Breaks**

This full day workshop will focus on the application of power quality solutions both at the individual equipment level and at the facility level. The workshop will include coverage of power quality topics such as harmonics, sags, flicker, grounding, drive tripping, transients, and UPS applications where solutions may be developed at the equipment level or possibly for the entire facility. The technical considerations and the economic tradeoffs for equipment-level vs. facility-level solutions for power quality problems will be covered.

The workshop will also include presentations on applicable standards related to power quality and mitigation techniques. A unique focus of this workshop will be on emerging manufacturing equipment that may cause or suffer from "new" power quality problems and also on what types of emerging technology may be used to develop "new" solutions. Vendor- sponsored breaks will be provided in the morning and afternoon and lunch will be provided. Technical presentations related to various power quality issues will continue throughout the luncheon.

**TO REGISTER for either Tutorial:** Download registration form from I&CPS Conference Website at [www.ieee.org/icps04](http://www.ieee.org/icps04) Or contact Richard Beatie at [r.beatie@ieee.org](mailto:r.beatie@ieee.org) or 813-289-0252. Credit Cards Accepted! Both Tutorials qualify for PDH Continuing Education Credits toward Professional Engineer license renewal!

### *Who is the I&CPS?*

The **Industrial and Commercial Power Systems** Department of the IEEE Industry Applications Society is a group of Power Engineers Serving Industry and Commerce. Some from the Tampa Bay area! These engineers write IEEE Standards, and the Color Book series, used by Industrial and Commercial customers of the power companies. They hold an annual Technical Conference every May. They also write and present Technical Papers and Tutorials of interest to engineers in this field. This is the **third** time the I&CPS Conference is being held in the Tampa Bay area!

## IEEE Member Wins Celebrate Engineering Banquet GRAND DOOR PRIZE!

The Celebrate Engineering Banquet (13 February 2004) was a wonderful experience for all members and guests who attended, but even more so for our FWCS Section Treasurer Ralph Painter, Manager, Tampa Electric Company, and his charming wife Genevieve, who were the lucky winners of the Grand Door Prize of the night! A digital camera!

Best Buy, 1725 N Dale Mabry Hwy, Tampa, donated this high end SONY DSC-P-92 Cybershot 5 Megapixel Digital Camera, valued at \$399.00, to the banquet committee to be the grand prize! If you visit their store, please mention the donation and thank them for their support of our annual and prestigious Awards Banquet!

## Brain Teaser Challenge Column

By *Butch Shadwell*

**March BTC** Several readers have already sent in answers to the last BTC, all were correct. The West Indian robotic problem went like this, “a little machine that was driven by two large wheels on either side, and a third idler wheel in the back that kept it stable. Each wheel could be advanced one thousandth of a turn for each pulse it was fed, and the drive wheels were 5 inches in diameter and mounted 10 inches apart. ...the count totalizer for each wheel showed the right wheel had been fed 1,000,000 counts and the left wheel had been fed 638,000 counts, all in the forward direction. If the robot was facing north (0 degrees on the compass) when it started these maneuvers, what direction was it facing when they ended? Assume there was no slippage of the drive wheels and that they had very small contact surfaces with the ground.” Nigel wasn’t his real name.

The simplest solution is to determine the difference and direction of the pulse count and then advance the higher count wheel alone to that degree. So we determine that the right has moved forward 362,000 counts. At 1000 counts per revolution, that means that the right wheel has advanced 362 turns more than the left one. Since the wheel spacing is 10”, the circumference of a full turn ( $2\pi$  radians) is  $20\pi$ ”. One full turn of a wheel covers  $5\pi$ ”. From this we know that 4 revolutions of one wheel, more than the opposite wheel, will take the robot full circle. Dividing 362 by 4, we get 90.5 complete circles by our machine. The last half circle means that the robot must be facing South at the end of the course. But I bet you already knew that.

**April BTC** One of the most fun things I have ever done is design some robotic control systems for an amusement park in northern England. In the mid 80’s I spent some time there installing these systems, and the robotic characters, at Alton Towers, located near Stafford, England. I got to install “Henry the Hound of the Towers” at the entrance promenade. Henry was a hound dog that stood about seven feet tall. It was very interesting to watch them building this world-class amusement park from scratch.

While working there, I stayed at a B&B that was owned by a professional chef. The food was great, and I always enjoyed a little conversation with the other guests and owners in the evening. My wife and I have really enjoyed traveling around Great Britain and staying at B&Bs. We’ve once stayed at a Scottish castle, and in some beautiful farm country too. But I digress.

Henry was a pneumatically actuated character. That is, all of his joints were operated by air pistons. The elbow used a 1” cylinder to move his forelimb out and in again. This cylinder had a ¼” piston rod. Henry’s arm extended just fine but would hesitate while retracting. The arm retraction was powered by the cylinder’s retraction motion, as opposed to the extension motion. With a 90 pound air supply, how much force was the cylinder applying to the retraction function?

*Reply to Butch Shadwell at [b.shadwell@ieee.org](mailto: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.*

# Students' Corner

## IEEE Student Branch at USF

The Spring Senior Banquet Awards Ceremony is scheduled for 23<sup>rd</sup> April 2004, at the Marshall Center Ballroom on Campus. The Senior Awards are a time to celebrate the culmination of years of hard work and dedication towards an undergraduate degree in Electrical Engineering. If you would like to sponsor a table or buy tickets please email us at [ieee@eng.usf.edu](mailto:ieee@eng.usf.edu).

As the end of the semester comes to an end, it is once again time to elect new student branch officers. Elections will be held on Wednesday 7<sup>th</sup> April 2004 in ENB 108 at 4pm. For any students interested in running for an office, please send an email to [ieee@eng.usf.edu](mailto:ieee@eng.usf.edu). Positions include President, Vice-President, Treasurer, Secretary, and Web-master.

The 2003-2004 year for the Student Branch has been quite eventful. We would like to thank our Student Branch Mentor, Mr. Jim Howard, for his guidance and encouragement, the Florida West Coast Section for their support, and all the students for supporting all of our events this past year.

## IEEE FWCS Science Fair Participation

By Carlomagno B. Dionson



This year's science fair turn out was great. We had approximately 10 IEEE members who took time and showed their support for elementary and high school students from various counties. Last year, we were only involved with two counties. This year we had IEEE member(s) judge Hillsborough, Manatee, Pasco, Pinellas, and Sarasota counties.

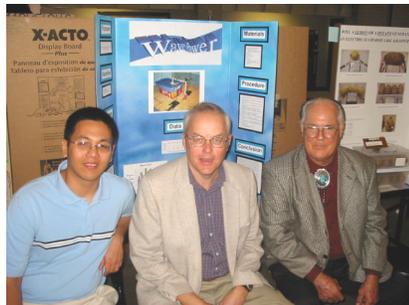
We also awarded four students from Hillsborough, Pasco, Pinellas, and Sarasota the IEEE FWCS Science Fair award. Their projects were among the best in the fair, and they certainly have the potential to be candidates for another IEEE FWCS sponsored program – Research Experience for High School students. The following

students received the honors: Aaron Wise (Hillsborough) – *Strengthening Ni/Au Nanorods for Use in a Bio-Motor*, Robert McDonald (Pasco) – *Wave Power*, Greg McCraine (Pinellas) – *Transmissive Hologram Using a Diode Laser*, Phuong Nguyen (Sarasota) – *Photovoltaic Cells Make My Lights Shine Free*.

Hopefully, in the next year, more IEEE members will participate in the regional science fairs of their counties. It is a very rewarding experience knowing that one has helped encourage elementary and high school students become future engineers or scientists. Many thanks to the following IEEE volunteers who have participated: John Conrad, Stephen Etz, Pam Hamilton, Jules Joslow, Jack Parker, Kristen Shipp, Art Stadlin, Chris Yakymyshyn, and Mr. Owen. See you next year!



Carlo, John Conrad, Mrs. Pam Hamilton, and Dr. Chris Yakymyshyn at Hillsborough.



Carlo, John Conrad, and Mr. Owen at Pasco.



Carlo, Dr. Chris Yakymyshyn, Mrs. Pam Hamilton, Ms. Kristen Shipp, and Mr. Jack Parker at Pinellas

## April 2004 Calendar of Events

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2	3
4	5	6	7 4pm: IEEE Student Branch Elections, USF	8	9	10
11	12	13 5:30pm IEEE FWCS EXCOM Meeting, TECO Hall	14	15 2004 Wireless and Microwave Tech Conference, Clearwater Beach	16 2004 Wireless and Microwave Tech Conf, Clearwater Bch	17
18	19	20 4:30-6PM Beckwith Tour & LTC Transformer Paralleling Seminar	21	22	23 USF EE Spring Senior Banquet Awards	24
25	26	27	28	29	30	

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