



The President's Message

Greetings to all Power Electronics Society members, friends, and colleagues. In 1999, we have several new officers, and in fact there are some more opportunities for volunteers if any of you are interested.



As your new Society President, I am glad to be part of our long and exciting ride, given the rapid growth of power electronics as the basic enabling technology of electrical energy use.

During 1999, the Power Electronics Society will be addressing member services and activities. We will be discussing ideas for support activities for recent graduates getting started in the field. We will be seeking volunteer leaders for possible new technical activities in areas as diverse as switching power supply standards, design of large inverters, power quality, and low-voltage power. We hope to provide leadership within the new Intelligent Transportation Systems Council, since power electronics is a dominant factor in the implementation of advanced transportation.

We will continue to enhance activities and forums for members everywhere in the world, through regional meetings, chapter development, and alternative media. Our Society is very active at the broad IEEE level in the development of electronic media and electronic publishing systems. Electronic information will be a key issue for the IEEE over the next several years. Another major effort in 1999 will be intersociety cooperation. We will be working with the Industry Applications Society, the Industrial Electronics Society and the Power Engineering Society to help coordinate conferences and member activities in power electronics. Several innovations are being discussed right now, such as low-cost joint memberships, a streamlined technical Division incorporating several societies, and joint publications. The objective is to best serve the needs of members.

We also have our active conference schedule for 1999. In March, the 14th Annual Applied Power Electronics Conference (APEC) will be held in Dallas, Texas, USA, at

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PESC '99 Previewed

On behalf of the IEEE Power Electronics Society, welcome to the 30th IEEE Power Electronics Specialists Conference in Charleston, South Carolina, one of the oldest cities in the United States. Charleston (Charleston) was founded at its present site in 1680. The city has a rich history and played important roles in the early economic development and eventual War of Independence that created the United States. Later, Charleston served as a focal point for political activism and military action that began the US Civil War. The conference site, Charleston Place, is a European styled hotel that is in the middle of the historic district of the city. Many art galleries, antique stores, restaurants, live music, historical homes, and

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INTELEC 98 Sets Another Record!

by Sharon Sugarek, INTELEC Publicity

Over 1300 delegates attended the record-setting 20th annual International Telecommunications Energy Conference-INTELEC 98 in San Francisco, California, USA, October 4-8, 1998. Delegates converged on San Francisco from over 40 countries, and included representatives from Asia, Europe, North America, South America and Africa. The program included technical sessions, workshops, tutorials and an exhibition at which delegates were able to see the latest in DC power systems, power monitoring products, battery technology, battery testing and monitoring systems, and related equipment offered by 60 companies from around the world.

The theme of the conference was "Integrated Global Communications Networks for the Twenty-First Century." Speakers in the opening plenary session addressed critical issues related to this topic, including life cycle costing of batteries, changing telecommunications networks and their effects on power systems, and the emerging -48 volt computer equipment topology with its implications for future communications networks. The conference offered 32 technical sessions, encompassing 128 technical papers, which addressed the many dimensions of powering global communications net-

Continued on page 4

New IEEE Fellows

The Institute of Electrical and Electronics Engineers recently announced the names of new Fellows that are effective on January 1, 1999. The Fellow grade of membership is conferred each year on a relatively small number of IEEE members to recognize distinction in the field of electrical and electronic engineering.

Following is a list of new Fellows in alphabetical order who are members of the Power Electronics Society.

- Florencio Aboytes, Comision Federal de Electricidad, Monterrey, Mexico: For contributions to the analysis and control of power systems.
John D. Birdwell, University of Tennessee, Knoxville, TN, USA: For contributions to the development of expert systems for use in control and information technologies.
Piero G. Maranesi, Universita degli Studi di Milano, Milano, Italy: For contributions to dynamic models of power electronic circuits and high-speed analog electronics.
John Michael Miller, Ford Motor Company, Dearborn, MI, USA: For contributions to the development of integrated power electronics, novel electric machines, and drives for automotive applications.

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## Tricks of the Trade

### A Generic Understanding of Power Loss Limits

Contributed by Phil Krein

University of Illinois at Urbana-Champaign

Ampacity tables, manufacturers' data, and our own experience are the usual ways to establish current capacity limitations of wires and other devices. This column provides a somewhat more quantitative rule that can help a designer compare cases and gain a general understanding of the limitations. Much of this information is summarized from [1].

Current limitations are usually related to thermal considerations. A good way to get a quantitative feel for limits is to consider the power loss per unit volume. In a resistive material with length  $l$ , cross section area  $A$ , and resistivity  $\rho$ , the resistance is well known as  $\rho l/A$ . The loss is  $\rho^2 I^2/A$ . The loss per unit volume is this value divided by  $lA$ . This reduces to  $\rho I^2/A^2$ . Let  $J$



represent the current density  $I/A$ . The loss per unit volume is  $\rho J^2$ .

How does this help? Well, in air, a loss on the order of  $1\text{ W/cm}^3$  seems unlikely to produce too much heating. For copper, with resistivity of about  $1.7 \times 10^{-8} \Omega\text{-m}$ , this corresponds to  $J$  of  $7.7 \times 10^6 \text{ A/m}^2$ , or  $770 \text{ A/cm}^2$ . Sure enough, when we check ampacity limits for modest temperature rises of single wires, they correspond closely to this value. Designers of magnetic devices usually favor lower current densities, and I suspect that current densities between about 100

$\text{A/cm}^2$  and  $500 \text{ A/cm}^2$  would cover most copper and aluminum conductors used in power converters. Some companies in the power electronics business have their own ampacity rules within this range. Designs for satellites have more severe limits, since heat must be removed by radiation rather than by convection.

It is interesting to see how the  $1 \text{ W/cm}^3$  rule extends to other applications. For example, low-cost ac line cords used in the U.S. and in Europe seem to push this up somewhat. A typical label limit corresponds to about  $1.6 \text{ W/cm}^3$ , and extension cords get noticeably warm at this level. In a converter, in which the efficiency should be high, lower values make more sense.

I have noticed that ripple current ratings on capacitors correspond to about  $0.1 \text{ W/cm}^3$ . This makes sense, since a capacitor is not intended to dissipate energy, but it also provides a helpful way to estimate ripple capabilities of devices when ratings are not available. Both wire resistance and internal equivalent series resistance (ESR) play a part in determining the loss. Perhaps you know of other applications (or maybe other rules) that help designers determine current capacity?

[1] P. T. Krein, *Elements of Power Electronics*, New York: Oxford University Press, 1998, Chapter 11.

*Editor's note: You are invited to send your own favorite Trick of the Trade for publication in the PELS Newsletter. Just send it in any convenient medium, spelling out symbols such as Greek letters. Also, send along a recent photo, color or b/w of any size, for insertion along with your favorite Trick.*

### New IEEE Fellows from page 1

- Balarama Vempaty Murty, General Motors R&D Center, Warren, MI, USA: For contributions to automotive power electronics systems and electrical drives
- Ira J. Pitel, Magna-Power Electronics, Inc., Boonton, NJ, USA: For contributions to the advancement of power conditioning and harmonic mitigation techniques in industry applications.
- Kaushik Rajashekara, Delphi Energy & Engine Management Systems, Indianapolis, IN, USA: For contributions to advancement of propulsion systems for electric and hybrid vehicles.
- Adel Razek, Centre National de la Recherche Scientifique, Gif sur Yvette, France: For contributions to 3D electromagnetic field modelling and coupled phenomena analysis in electromagnetic systems.
- Paolo Tenti, University of Padova, Padova, Italy: For contributions to the application of modern control techniques in power electronics circuits and systems.
- Andrzej Maria Trzynadlowski, University of Nevada, Reno, NV, USA: For contributions to the development of stochastic methods of pulse width modulation, and to drive systems design

### Request for Volunteer Associate Editors or Reviewers for the IEEE Transactions on Power Electronics

We presently have twenty-six Associate Editors and more than 250 reviewers. If you are interested in becoming either an Associate Editor or a Reviewer, please contact

Richard G. Hofst

Editor, *Transactions on Power Electronics*

Professor Emeritus

University of Missouri-Columbia

Electrical Engineering Department

139 EBW

Columbia, MO 65211

**Make your plans now**  
for

**APEC**

Adam's Mark Hotel  
Dallas, Texas USA  
March 14-18, 1999

#### IEEE Power Electronics Society

##### Officers

Philip Krein, President

Thomas Habetler, V. P., Operations

Kevin Fellhoelter, V. P., Meetings

Richard Bass, Treasurer

<http://www.pels.org>

The IEEE Power Electronics Society Newsletter is published quarterly by the Power Electronics Society of the Institute of Electrical and Electronics Engineers, Inc., 445 Hoes Lane, Piscataway, NJ 08855, USA. Sent automatically at a cost of \$1.00 per member per year (included in Society fee) to each member of the IEEE Power Electronics Society. Printed in the U.S.A.

News items should be sent to: Harry A. Owen, Jr., Editor, *PELS Newsletter*, 69 Forest at Duke Drive, Durham, NC 27705, USA; TEL: +1-919-489-2934; FAX: +1-919-660-5293; e-mail: hao@ee.duke.edu. Deadlines for copy are March 15, June 15, September 15 and December 15. Submission of items by e-mail in plain-text format is preferred. Plain-text (straight ASCII) submissions on diskettes of either size are welcome. A backup printout should be mailed with a diskette. Fax submissions are acceptable, but are least desirable. Full-page calls for papers and announcements of PELS-sponsored conferences are welcome and should be sent as high-quality hard copy.

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The 21st International Telecommunications Energy Conference-INTELEC 99-will be held at the Falconer Center in Copenhagen, Denmark, from Sunday June 6, 1999 through Wednesday June 9, 1999.

INTELEC is the international forum for the exchange of information on energy, power and the environment for communications systems. The conference provides management, policy makers, designers, manufacturers, distributors and others with opportunities of discussing a wide variety of topics related to power systems, energy storage systems, the environment, technologies and energy management.

The theme for INTELEC 99 is **Utility and Telecommunications-Environmental Management in Energy Systems.**

This theme requires the program being supplemented with presentations dealing with new aspects and opportunities for better environmental management in the technical areas covered by the Conference. The Conference will give special prominence to those areas of power development in relation to telecommunications that offer the greatest scope for change, and are designed with the environment in mind. These areas are:

- Energy management in society and in network installations
- Relations with public electricity suppliers
- Design for the environment

More than 100 papers will be presented via plenary sessions, verbal presentations, poster sessions and discussion forums. More than 600 representatives from all over the world are expected to attend.

### Scope of Conference

The papers will be included in the following main tracks:

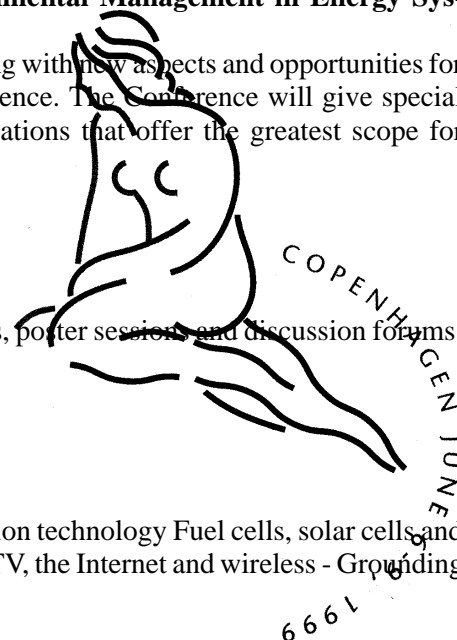
- **Power systems**  
Modelling, simulating and analyses - AC/DC power supplies - New distribution technology Fuel cells, solar cells and wind power systems - Monitoring, supervision and control - Powering cable TV, the Internet and wireless - Grounding - Building and environmental systems
- **Energy storage systems**  
Battery technology - Flywheel technique - Super conductivity magnetic energy storage systems (SMES)
- **Environment**  
Policies and guidelines - Environmental management systems (EMS) - Design methods - Life cycle analyses (LCA) - Recycling technologies - Waste management systems (WMS) - Electromagnetic fields (EMF) - Electrical safety - Materials and processes
- **Conversion technology**  
Power electronics - Building blocks power electronics - Component technology including magnetics and semiconductors - Circuits analyses and control - DC/DC conversion - Uninterruptable power supplies (UPS) - Electromagnetic compatibility (EMC) - Physical and thermal design - Reliability - Specifications and standards
- **Energy management**  
Asset management - Maintenance - Energy information systems - Demand side management (DSM) - Load demand management (LDM)

The deadline for submission of abstracts was December 1, 1998. Notification of paper acceptance and issue of the Advanced program will occur February 1, 1999. The final date for submission of manuscripts is April 1, 1999.

**For additional information, contact:**

**INTELEC 99**  
c/o DIS Congress Service  
Herlev Ringvej 2C  
DK-2730 Herlev  
Denmark  
FAX: +45-44-92-50-50

**Web site: <http://www.teledanmark.dk/intelec99> - e-mail: [dis-con@inet.uni2.dk](mailto:dis-con@inet.uni2.dk)**





## CONFERENCE ANNOUNCEMENT

14th Annual

**Applied Power Electronics Conference and Exposition**

**March 14-18, 1999 at the Adam's Mark Hotel**

**Dallas, Texas, USA**

### Conference Highlights

- Full technical program of presented papers.
- Professional Education Seminars on important topics for power electronics professionals including any one involved in marketing, quality and manufacturing.
- Exposition featuring component, equipment and service leaders in the power electronics industry.

*Hotel Reservation and Conference Forms on opposite page*

For additional information, contact:

APEC '99

2000 L Street, N.W., Suite 710, Washington, DC 20036 USA

TEL: +1-202-973-8664, FAX: +1-202-331-0111

e-mail: [apec@courtesyassoc.com](mailto:apec@courtesyassoc.com)

Wed site: [www.apec-conf.org](http://www.apec-conf.org)

APEC is sponsored by the IEEE Power Electronics and Industry Applications Societies and the Power Sources Manufacturers Association

### INTELEC 98 from page 1

works of the future.

INTELEC 98 was chaired by Tom Taylor of Taylor Engineering and Lou Scerbo of Bellcore. Dave Feder of Electrochemical Energy Storage Systems, Inc., received an award from the INTELEC 98 Management Committee, recognizing his long-standing commitment to and support of INTELEC and the power industry

The record-setting INTELEC 98 closed with a presentation by Bent Mortensen, Chairman of INTELEC 99, which will convene in Copenhagen, Denmark June 6 through June 9, 1999. The "Call for Papers" has been issued and abstracts were due by December 1, 1998. More information is available on the website <http://www.teledanmark.dk/intelec99>.

INTELEC 98 Proceedings (# CH-36263) may be ordered from IEEE at 732-562-3872 or by e-mail to [customer.services@ieee.org](mailto:customer.services@ieee.org). Proceedings are \$91 for IEEE members and \$182 for nonmembers.



Dave Feder (center) receives award from Tom Taylor for long-standing contribution to INTELEC while Lou Scerbo (right) applauds



Jon Akerlund presentation in the INTELEC 98 Plenary Session

**HOTEL RESERVATION FORM**

**Applied Power Electronics Conference — Dallas, TX, March 14–18, 1999**

Name of Group: IEEE – APEC'99  
(Please print or type)

**Remember! Cut off date is February 12, 1999**

Reservations received after February 12 will be confirmed on a space available basis.  
Reservations must be accompanied by a check or major credit card for one night's room payment.

NAME \_\_\_\_\_

CARD # \_\_\_\_\_

ORGANIZATION \_\_\_\_\_

CREDIT CARD TYPE \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE/COUNTRY \_\_\_\_\_ ZIP \_\_\_\_\_

SIGNATURE \_\_\_\_\_

PHONE \_\_\_\_\_

ARRIVAL DATE \_\_\_\_\_ DEPARTURE DATE \_\_\_\_\_

FAX \_\_\_\_\_

**PLEASE DON'T FORGET TO MAKE CHECK OR MONEY ORDER PAYABLE TO:  
ADAM'S MARK HOTEL**

**CANCELLATION POLICY:** Deposits refundable if your reservation is canceled 72 hours in advance of arrival date. Call (214) 922-8000 to cancel, and be sure to record your cancellation number.

**HOTEL RATES:**  
Single \$137.00  
Double \$157.00

**Please send reservation form and one night's deposit to the hotel:**

The above rates do not include city or state taxes. These will be an addition to your hotel bill.

Adam's Mark Hotel Dallas  
Reservations  
400 N. Olive Street  
Dallas, TX 75201  
Tel.: (214) 922-8000, Fax: (214) 777-6532

Mail this form by February 12th to: **Adam's Mark Hotel Dallas**  
Reservations  
400 Olive Street  
Dallas, Texas 75201

You must include one night's payment with your reservation.

**ADVANCE REGISTRATION FORM**

**Applied Power Electronics Conference and Exposition  
March 14–18, 1999, Adam's Mark Hotel, Dallas, Texas**

(Copy both sides of form for additional registrants)

NAME \_\_\_\_\_  
Last First

ORGANIZATION \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE/Country \_\_\_\_\_ ZIP \_\_\_\_\_

TELEPHONE ( \_\_\_\_\_ ) \_\_\_\_\_ FAX ( \_\_\_\_\_ ) \_\_\_\_\_ E-Mail \_\_\_\_\_

IEEE MEMBERSHIP NUMBER \_\_\_\_\_

SPOUSE'S NAME ATTENDING \_\_\_\_\_

PSMA/IAS/PELS Member (please indicate) \_\_\_\_\_

Registration must be received by February 12, 1999 to qualify as Advance Registration.

Check here if you have previously FAXED this form.

To avoid duplication, please do not mail *and* fax this form with credit card payments. Your card may be charged twice!

Mail completed form and registration fees to:  
Attn.: Registrar  
APEC'99  
Suite 710  
2000 L Street, NW  
Washington, DC 20036

**Note:** Cancellations of advance registrations must be *in writing* and must be received by February 12, 1999. Advance payments will be refunded, less a \$25 service charge, after the conference.

**Professional Education Seminars**

**AMOUNT**

IEEE/PSMA Member before Feb. 12 @ \$230.00 .....\$ \_\_\_\_\_  
IEEE/PSMA Member after Feb. 12 @ \$275.00 .....\$ \_\_\_\_\_  
Non-Member before Feb. 12 @ \$285.00 .....\$ \_\_\_\_\_  
Non-Member after Feb. 12 @ \$335.00 .....\$ \_\_\_\_\_  
Student (must show valid ID) @ \$45.00 .....\$ \_\_\_\_\_

For the Professional Education Seminar and Technical Session Registration, simply fill in both sections of the registration form. *Professional Education Seminar* registration includes one copy of the Seminar Workbooks and access to all seminars on Sunday and Monday morning. *Technical Session* registration includes one copy of the Conference Proceedings and CD Rom and entrance to all technical sessions, the Exposition, receptions, Rap Sessions, and the Wednesday Evening Banquet.

**Technical Sessions**

IEEE/PSMA Member before Feb. 12 @ \$330.00 .....\$ \_\_\_\_\_  
IEEE/PSMA Member after Feb. 12 @ \$390.00 .....\$ \_\_\_\_\_  
Non-Member before Feb. 12 @ \$405.00 .....\$ \_\_\_\_\_  
Non-Member after Feb. 12 @ \$480.00 .....\$ \_\_\_\_\_  
Student (must show valid ID) @ \$100.00 .....\$ \_\_\_\_\_

**MAKE CHECKS PAYABLE TO: APEC '99 (U.S. Dollars only).**

Visa  Master Card # \_\_\_\_\_

Signature \_\_\_\_\_ Exp. Date \_\_\_\_\_

**Miscellaneous**

Tuesday Lunch @ \$8.00 .....\$ \_\_\_\_\_  
Wednesday Lunch @ \$8.00 .....\$ \_\_\_\_\_  
Addn'l Wednesday Banquet Dinner @ \$40.00 .....\$ \_\_\_\_\_  
Addn'l Seminar Workbook @ \$65.00 .....\$ \_\_\_\_\_  
Addn'l Conference Proceedings @ \$70.00 .....\$ \_\_\_\_\_  
Both Con. Proc & Cd Rom & Sem. Wbk @ \$120.00 .....\$ \_\_\_\_\_  
Spouse Tour of Dallas @ \$26.00 per person .....\$ \_\_\_\_\_

Payment **must** be received by February 12, 1999 to qualify as Advance Registration.

**FOR OFFICE USE ONLY**

\$ Paid \_\_\_\_\_ \$ Owes \_\_\_\_\_ Ck \_\_\_\_\_

Auth. # \_\_\_\_\_ Dep. # \_\_\_\_\_ Date \_\_\_\_\_

**TOTAL AMOUNT ENCLOSED** .....\$ \_\_\_\_\_



## CONFERENCE ANNOUNCEMENT

30th Annual

Power Electronics Specialists Conference

June 27-July 1, 1999 at the Charleston Place Orient-Express Hotel  
Charleston, South Carolina, USA

PESC is one of the major annual conferences of the IEEE Power Electronics Society. It provides a forum for international specialists in power electronics to present and discuss papers on forward-looking topics in this fast-evolving field.

For additional information, contact

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e-mail: [hudgins@enr.sc.edu](mailto:hudgins@enr.sc.edu)

Web site: [www.ece.sc.edu/pesc99/](http://www.ece.sc.edu/pesc99/)

### COBEP '99 CALL FOR PAPERS

The 5th Brazilian Power Electronics Conference (COBEP' 99) is being organized by the Brazilian Power Electronics Society (SOBRAEP) and by the Federal University of Paraná and Federal University of Santa Maria, Brazil. The congress will take place September 19-23, 1999, in Foz do Iguaçu, state of Paraná, southern Brazil. The aim of this conference is to provide a forum for the discussion for Brazilian and foreign experts in the Power Electronics area, featuring strong participation of industry and academia.

**A list of relevant topics includes, but is not limited to the following**

- (1) Power semiconductor devices, components and magnetics;
- (2) DC/DC converters and DC power supply systems;
- (3) DC/AC and AC/DC converters for power supply and UPS applications;
- (4) Motor drives and motion control;
- (5) Electric machines;
- (6) Control theory applied to power electronics systems;
- (7) Computer-aided modeling, analysis, design and synthesis of power electronics systems;
- (8) Harmonics and reactive power compensation and high power factor AC/DC converters;
- (9) Power quality, electromagnetic compatibility (EMC) and electromagnetic interference (EMI) issues;
- (10) Power electronics in generation, transmission and distribution and renewable energy systems;
- (11) Automotive, aerospace, transportation and utility applications of power electronics;
- (12) Electronic ballast for lighting;
- (13) Education in power electronics.

#### Information for authors

Authors are invited to submit (4) four copies of an extended digest in English of no less than four pages and no more than six pages. A cover page must contain the title of the paper, name and affiliation of the author(s), mailing address, telephone and FAX number, e-mail address and the topic of the paper. The heading of the extended digest must contain only the title of the paper. The accepted papers can be presented at the Conference in English, Portuguese or Spanish. The overhead transparencies or slides, however, must be prepared in English. **Deadline for submission of digest: March 12, 1999; Notification of acceptance: May 14, 1999; Final version of the paper: July 9, 1999.** Please submit paper digests to COBEP '99 Program Chair, Prof. José Renes Pinheiro, Universidade Federal de Santa Maria, UFSM-CT-DELC, 97105-970-Santa Maria-RS, Brasil, e-mail [renes@pequim.ctlab.ufsm.br](mailto:renes@pequim.ctlab.ufsm.br).

For more information, visit the conference web site <http://www.sobraep.ufsc.br/cobep99>.

### Standards Group Report

The 6th Formal Meeting of the IEEE P1461 Working Group was held at Power Systems World/PCIM November 11, 1998. P1461 is developing recommended practices for power electronic module interfaces so that power modules can be more easily applied in applications ranging from electric vehicles to motor drives and uninterruptible power supplies.

P1461 is currently developing a working table of contents, module classification scheme, and a glossary. A new slate of officers was approved as follows: Committee Chair is Mark Harris (Satcon), Cochairs are Sunil Chaya (General Motors) and Jeff Fishbein (Bergquist), Secretary is Rob Lankin (Agile Systems). Tentative meeting locations for 1999 include APEC and IAS. For a complete update of committee activity, visit the web site at <http://grouper.ieee.org/groups/1461/>.

Submitted by Jason Lai

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e-mail: [laijs@vt.edu](mailto:laijs@vt.edu)

**AFRICON '99**  
**CALL FOR PAPERS**  
**"ELECTROTECHNICAL SERVICES FOR AFRICA"**

**Wednesday 29 September 1999 to 1 October 1999**

**Tutorials on 28 September 1999**

**Hosted by Cape Technikon, Cape Town, SOUTH AFRICA, and co-sponsored by the IEEE Region 8, IEEE South Africa Section, SAIEE and FRD**

**BACKGROUND**

AFRICON is one of the major international conferences sponsored by Region 8 of the Institute of Electrical and Electronics Engineers (IEEE). Previous AFRICONS were held in Nairobi (1983), Abidjan (1987), Mbabane (1992) and Stellenbosch (1996). AFRICON '99 is organized by the Cape Technikon, in association with the IEEE, SAIEE and the FRD.

**ENQUIRIES**

AFRICON '99 Chair: Prof. Nico Beute  
 AFRICON '99 Secretariat: Heidi Neves  
 Cape Technikon, P O Box 652, 8000 Cape Town, SOUTH AFRICA  
 TEL: +27- 21- 460-3657, FAX: +27-21-465-4940  
 e-mail: Africon@norton.ctech.ac.za

**For complete information on the conference, including call for papers and digest submission visit the conference web site <http://www.ieee-sa.sun.ac.za/africon>**

**The President's Message** from page 1

the Adam's Mark Hotel. APEC continues to grow as a major technical conference, with a strong industry participant base. Early in June, the International Telecommunications Energy Conference (INTELEC) will be held in Copenhagen, Denmark. Late in June, the 30th Annual Power Electronics Specialists Conference (PESC) will be held in Charleston, South Carolina, USA. PESC continues its well-known role as the primary power electronics research conference, with a strong international program filled with new ideas and techniques for the whole range of challenges in our field. Our major meetings include professional development sessions that can help you meet continuing education requirements as well as your own professional and personal goals. There are also several regional meetings that cooperate with our Society, including a September meeting in Brazil, along with a number of others. If you have not been involved in the past, we certainly encourage you to give APEC, PESC, or perhaps another meeting a try this year. One of my roles as President is to represent us as a member of the IEEE Technical Activities Board (TAB). I will also be serving on the TAB Products Committee, which oversees all technical products (books, publications, electronic media, and so on) of the IEEE. At the November TAB meeting, the major issues included:

- Electronic publications. The IEEE is implementing an innovative Web-based plan for electronic publications, based on extensive surveys of member and other customer needs. An early version is now available to libraries and institutional cus-

tomers.

- Product and publication uniformity. As we look at various IEEE transactions, conference publications, newsletters, announcements, and other materials, the lack of consistent form and content is striking. There is an obvious need to establish a clearer identity for IEEE. While there was discussion about possible new logos and publication formats, the larger issue of a clear and uniform identity will be a major TAB topic for 1999.

- Financial models and administrative streamlining. IEEE is a nonprofit organization with a huge array of activities, large budgets, and professional support staff. There is a need to establish equitable and effective ways to finance activities that benefit all of IEEE. There is also a need to make the most effective use of support staff. Alternative models for finances and for volunteer and staff interaction will be developed and discussed during 1999.

I look forward to an active and interesting year for our Society. How can the Society be of more value to you? Please let me hear from you with suggestions, ideas, or activities, or if you are interested in exploring some of the volunteer positions in the Society. I hope to meet many of you at APEC or at PESC this year.

*Philip Krein, PELS President*  
*University of Illinois*  
*Dept. of Elec. and Comp. Engrg.*  
*1406 W. Green St.*  
*Urbana, IL 61801*  
*TEL: +1-217-333-4732*  
*FAX: +1-217-333-1162*  
*e-mail: krein@ece.uiuc.edu*  
*<http://power.ece.uiuc.edu>*

**Technical Program Committee Meeting for PESC '99**

*by René Spée, Technical Program Chair and Jerry Hudgins, Conference Chair*

The planning process for the technical program for PESC '99 in Charleston is almost complete. We received 369 digests, of which 362 were in submitted in time for the review process. The program committee consisted of 187 reviewers worldwide, and each reviewer evaluated approximately ten digests within his or her area of expertise. Each submission was reviewed by at least four experts in the field; most digests had five reviews.

Twenty members of the program committee met in San Diego on December 12, 1998, to finalize the technical program based on the results of the peer review process. The committee selected 201 papers for 28 technical sessions and the plenary session, with an overall acceptance rate of 55% percent, comparable to previous PESC's. As a result of the high quality of the submitted digests and the hard work by the technical committee, PESC '99 will continue the tradition of being a world-class technical conference sponsored by the IEEE Power Electronics Society, with outstanding contributions in all areas of electronic power processing:

- Dc-to-dc converters and distributed dc power supply systems
- Rectifiers, inverters, and other ac-to-dc and dc-to-ac converters for power supply and UPS applications
- Motor drives and motion control
- Automotive, aerospace, transportation,

Continued on page 10



## Call for Papers PEDS '99

Hong Kong 26-29 July, 1999

The Third IEEE International Conference on Power Electronics and Drive Systems



### Organizers

**IEEE Hong Kong Section, Joint Chapter of Power Engineering,  
Industry Applications and Power Electronics Societies  
The Hong Kong Polytechnic University**  
*In Technical Cooperation With*  
**IEEE Industry Applications Society  
IEEE Power Electronics Society**

### Sponsors

**IEEE Singapore Section (PEDS Central Committee)**  
**The University of Hong Kong  
City University of Hong  
Hong Kong Technical College (Tsing Yi)**

The PEDS '99 aims to provide a forum for academic and industrial researchers in the area of power electronics and drives for exchange of ideas and for interactions. The four days of technical program consists of one day of short courses and three days of technical paper presentations. The Technical Program Committee is soliciting papers in the area that include but not necessarily limited to:

**CONVERTER TOPOLOGIES AND CONTROL:** Advanced DC/DC, AC/DC, DC/AC, AC/AC power converters, including soft-switched and resonant converters; matrix converters; theoretical and computer based modeling and analysis; PWM and other control techniques; methods and analysis; analog and digital hardware implementation.

**ELECTRIC DRIVES AND CONTROL:** Drives involving DC motors; AC motors; switched reluctance motors; synchronous reluctance motors; stepping motors; advanced control techniques applied to electric drives; analysis and modeling in motion control; intelligent motion control.

**POWER DEVICES AND ICS:** Power switching devices and modules; integrated power and signal electronic modules; smart power devices; semiconductor technology; control and protection of semiconductor modules.

**MECHATRONICS:** Actuator design, modeling, analysis and control; power electronics related aspects of mechatronics.

**UTILITY INTERFACE:** Harmonic effects; power factor corrections in converters; RFI, EMI and EMC problems and solutions.

**COMPUTER APPLICATIONS:** Computer aided design, modeling simulation, analysis and diagnosis of power converters and drive systems.

**PACKAGING TECHNOLOGY:** Packaging aspects of magnetic, capacitive and other power electronic components; cooling of power devices; protection techniques in converters and drives; special PCB design.

**APPLICATIONS:** DC power supplies; UPS systems; battery chargers; static var compensators; HVDC transmissions; FACTS; photovoltaic applications; induction heating; electrical vehicles; robotics; industrial electric drives; traction; renewable energy; environment friendly systems.

**Tutorials:** Tutorials in the area of power converters and electric drives will be provided during the conference.

**Submission Guidelines:** Authors are invited to submit three copies of abstract and extended summary (not more than 5 pages including figures). The first page should include the title, the name of author(s), affiliation, mailing address, fax number, e-mail address, preferred topic area, and an abstract of 100 words. The second and subsequent pages should include the title and extended summary. The submission should be sent to the Technical Program Chairman, address below, for reviewing.

### Author's Schedule

Deadline for extended summary: 31 January 1999

Notification of acceptance: 31 March 1999

Deadline for final paper submission: 15 May 1999

### Conference Chairman

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Columbia, SC 29208 USA  
e-mail: hudgins@ece.sc.edu

### Organizing Chairman

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### Technical Program Chairman

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### ABOUT HONG KONG

(Hong Kong Tourist Association: <http://www.hkta.org/home.html>)

At the stroke of midnight on 30 June, 1997, Hong Kong returned to China after 150 years of colonial rule, and exciting historical event. Hong Kong is now a Special Administrative Region of China with a high degree of autonomy and operates under the arrangement of "One Country, Two Systems." It retains its own legal, social and economic systems which means not change in life-style for residents and visitors alike. More than one year after the handover, Hong Kong is as vibrant as ever, bursting with life and dynamism. The calendar is overflowing with shows, events and festivals. Who new areas of restaurants are spilling onto the streets and people are out in force lapping up an almost hypnotic carnival atmosphere. Never has Hong Kong been so entertaining.

#### Basic Facts for Hong Visitors

HK\$: Remains as a separate, internationally-recognised currency linked to the US\$.

Visa: Same requirements as under British sovereignty.

Laws and the judicial system: Same as practised before July 1997.

Security: Same local police force that has made Hong Kong one of the safest cities in the world.

Note: There is still boundary and immigration control from the rest of China and English is still an official language.



## **EPE '99, 8th European Conference on POWER ELECTRONICS AND APPLICATIONS**

**7 - 9 September 1999, Lausanne, Switzerland**

Synopsis deadline 9 October 1998

Sponsored by: European Power Electronics and Drives Association

Hosted by: Swiss Federal Institute of Technology Lausanne

### **Organisation and Venue**

The EPE '99 Conference is sponsored by the EPE Association and will be held in Lausanne, on 7 - 9 September 1999. It is hosted by the Swiss Federal Institute of Technology Lausanne.

### **Aims of the Conference**

EPE is an opportunity for European specialists in power electronics, systems and components, to present papers and attend sessions on state-of-the-art technology in this challenging and evolutionary sector of

technology. The conference aims to be a meeting forum for researchers, developers and specialists from the industry. Papers are encouraged on all topics described hereunder for interdisciplinary discussions of new ideas, research, development, applications and the latest advances in the field of power electronics.

### **Topics**

Power Electronics has become the enabling technology for the majority of power processing throughout electronic and electrical engineering. It is used in all areas of electrical power conversion and control, from switched and resonant mode power supplies, through industrial and traction drives. Recent innovations in robotics and sensors will be addressed with additional special conference topics that include devices, power electronics converter circuits, power supplies, control, electrical machines and adjustable speed drives, motion control and robotics, measurements and sensors, electric and hybrid vehicles, power electronics in generation, transmission and distribution, systems engineering, emerging technologies, and education.

### **Presentation of Papers**

Contributions to EPE '99 must be presented either as a lecture presentation or as a dialogue presentation. A manuscript must be submitted in English in both cases for inclusion in the Conference Proceedings (CD-ROM). Papers for lecture sessions will be strictly limited and selected on the basis of wide audience appeal, ease of understanding and potential stimulation of broad ranging discussion. Dialogue presentation will take place in the afternoon. The stands will be grouped by topic, and dialogue session programmes indicating topics and locations will be handed out at the end of the morning sessions. No lecture session will be organised during the dialogue sessions.

### **Tutorials - Call for Proposal**

Several tutorials will be held prior to the Conference. Authors willing to propose a tutorial at EPE '99 are invited to send a proposal to the secretariat (same address as for the synopses). The proposal will consist of a three-page summary including tutorial title, name and affiliation of the lecturer(s), tutorial objectives and audience, topical outline and provisional schedule of the tutorial.

### **Social Programme**

Special care will be devoted to the organisation of interesting social events.

### **Content of Synopses**

The synopses should consist of: a 2 to 3 pages summary, including an abstract with no more than 50 words; topic number and indication of the preference for dialogue or lecture presentation must be clearly mentioned; key diagrams; a references list. Seven copies of the synopses must be submitted. Two copies of the synopses must be headed with the following information: paper title, author(s), affiliation(s), mail addresses, telephone and fax numbers. Authors of papers provisionally selected for presentation will receive an author's kit which includes instructions for preparing the dialogue papers and/or the lecture papers (as appropriate). Final selection will be based on the full paper. The paper will only be included in the conference proceedings after receipt of one full registration fee in due terms. Synopses should be sent to:

**EPE '99 Conference Secretariat, EPE Association**

**c/o VUB-TW-ETEC**

**Pleinlaan 2**

**B-1050 Brussels, Belgium**

*SYNOPSIS SENT BY FAX AND E-MAIL ARE NOT TAKEN INTO CONSIDERATION*

### **Deadlines**

Intending authors should note the following deadlines: Receipt of Synopses--9 October 1998; Notification of provisional acceptance--25 February 1999; Receipt of full typescript for final review--1 May 1999.

### **Working Language**

The working language of the Conference is English which will be used for all printed material, presentations and discussion.

### **Programme and Registration**

A provisional programme and registration form will be published a few months before the Conference, and sent to all who complete and return the attached form.

### **Exhibition**

There will be an exhibition associated with the Conference. Please contact the Secretariat for more information.

### **Conference Chairman**

M. Jufer, Swiss Federal Institute of Technology Lausanne

### **Program Chairman**

Ph. Lataire, Vrije Universiteit Brussel, Brussels

### **Program Co-chairman**

Y. Perriard, Swiss Federal Institute of Technology Lausanne

## Preview of 1999 IEEE Power Electronics Specialists Conference from page 1

other historical sites are all within easy walking distance around the hotel.

PESC continues its tradition as a forum for long-term innovation and original approaches to power conversion problems. This annual meeting is for all engineers and researchers who work or are interested in future developments of power electronics. The 29 technical sessions are our most important activity, but you should be aware that the conference also includes three formal Tutorial Sessions, three informal Rap Sessions, and an industrial tour program.

The final program and Record contains 201 papers, selected from 362 submitted digests through a rigorous review process. Our ten Topic Chairs worked with 187 reviewers worldwide to select the program. The Organizing Committee extends thanks to the authors and reviewers. Your participation and interest are appreciated.

Wednesday will be capped by a banquet at Boone Hall, a historical Southern plantation. The evening's entertainment will

include live music and other surprises. On Thursday, we will gather for the Annual Awards Luncheon of the Power Electronics Society. The William E. Newell Award, the highest honor bestowed in the field of power electronics, is traditionally given out at this event. Other major awards include the Young Power Electronics Engineer and the Outstanding Service Awards. On Friday, several industrial tours are available. These tours include a visit to the Square D Company - Groupe Schneider plant, where conventional industrial switchgear and electronic variable speed drives are manufactured. Another tour is through the co-generation facility at Westvaco Paper Corporation.

Information about PESC '99 can be obtained from the PELS web site, <http://www.pels.org/>, under "PELS Committees", or by contacting:

**Robert Myers**  
IEEE PESC '99  
3685 Motor Ave., Suite 240  
Los Angeles, CA 90034-5750 USA

TEL: +1-310-287-1463  
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We look forward to seeing you in Charleston at PESC '99

## PESC '99 Technical Program from page 7

and utility applications of power electronics

- Power quality, electromagnetic compatibility (EMC) and electromagnetic interference (EMI) issues
- Discrete and integrated power semiconductor devices, modules, and packaging
- Passive components including capacitors and magnetic devices
- Computer-aided modeling, analysis, design and synthesis of power electronics systems
- Control theory as applied to power elec-

tronics systems

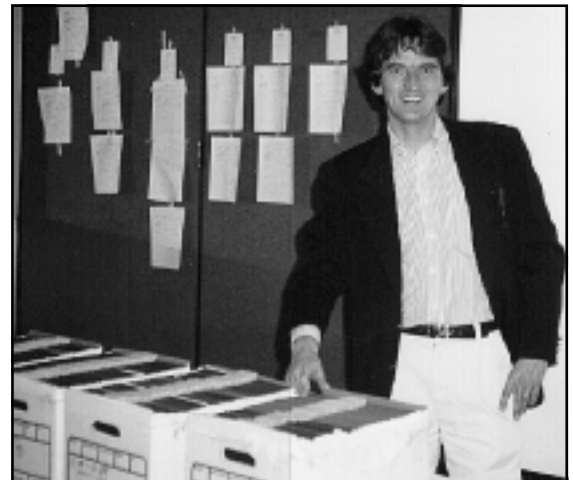
PESC '99 will kick off on Sunday, June 27, 1999 with three tutorials, covering a diverse range of topics: advanced modeling techniques, power quality, and high frequency magnetics design. The technical program will begin on Monday, June 28 with a plenary session in the morning and will continue from Monday afternoon through Thursday, July 1, with four parallel sessions each morning and afternoon. In addition, on Tuesday evening we continue the PESC tradition of no-holds barred rap sessions, ex-

amining topics of timely importance. Technical tours on Friday round out the program.

We have begun the task of notifying authors of the status of their papers and compiling the preliminary program for publication in hard copy as well as on the PESC '99 web site at <http://www.pels.org/>, under "PELS Committees". The preliminary program, along with registration forms, hotel information and links to places of interest in Charleston should be on-line around the end of January 1999.



PESC '99 Technical Program Committee members at work. From left, Jaime Arau, Steve Bayne, Emanuel Landsman, Jon Locker, Annabelle van Zyl, Shihashis Bhowmik. Background, Arthur Witulski and Tamotsu Ninomiya.



René Spée, PESC '99 Technical Program Chair

## Jaime Arau New Chapter Development Chair

From January 1999 on I shall be working for PELS as the Chapter Development Chair, hoping to continue with the excellent work carried out by Bill Dunford. This is why this charge represents for me a high honor and responsibility. Therefore, I am very grateful to our president Phil Krein for having found me a reliable person to be in charge of this function.



Looking forward to improving the consolidation and the creation of new chapters, I would like to put myself at your disposal for any kind of assistance. Therefore, I am inviting the already existing chapters and groups interested in creating new chapters to get in touch with me in order to update their data and to give them our support.

It is important that the chapters take into account as motivational elements of their activity, the possibility of obtaining a benefit by means of the Distinguished Lecturers Program as well as with the annual economic support for the local chapters operation.

I would like to take advantage of this opportunity to wish you a happy new year for 1999, hoping to hear from you very soon.

*Jaime Arau*  
PELS Chapters Development Chair  
CENIDET, P.O. Box 5-164  
Cuernavaca, Mor., Mexico  
FAX: +52-73-12-24-34  
j.arau@ieee.org

## IPEMC '2000 in Beijing

IPEMC '2000, 3rd International Power Electronics and Motion Control Conference, is scheduled for August 15-20, 2000, in Beijing, China. The conference is sponsored by the China Electrotechnical Society and the National Nature Science Foundation of China, in cooperation with the IEEE Power Electronics Society and IEEE Beijing Section and IEEE PELS Beijing Chapter.

For submission requirements and conference details, contact Dr. Xiaohuang Jiang, General Secretary, Dept. of Electrical Engineering, Tsinghua University, Beijing, 100084, PR China, TEL:+86-10-62782296, FAX: +86-10-62783057, e-mail: ipemc@pwrse.ea.tsinghua.edu.cn.

*Submitted by X. S. Cai, Prof., Dept. of Electrical Engineering Tsinghua University, Beijing, China, Chairman, IEEE PELS Beijing Chapter.*

## Society Election Results

The annual election of officers and new members at large of the Administrative Committee (AdCom) takes place in the fall each year and the results are announced at the fall meeting of the AdCom. Philip Krein of the University of Illinois was elected to the presidency of the Power Electronics Society for 1999. Other officers elected for the coming year are Thomas Habetler, Georgia Institute of Technology, Vice President for Operations and Kevin Fellhoelter, Lucent Technologies, Vice President for Meetings. Richard Bass, Georgia Institute of Technology, was appointed Treasurer by the President.

New AdCom members at large elected for the three-year term 1999-2001 are Hirofumi Akagi, Dusan Borojevic, Will Dunford, Mark Jacobs, Kay Smedley and Katsuichi Yotsumoto. Ad Com members at large serving their third year in 1999 are Thomas Habetler, W. Gerard Hurley, Dean Patterson, Seth Sanders, Tore Undeland and Robert White. Jaime Arau, Arthur Kelley, Francesco Profumo, René Spée, Daan Van Wyk and Thomas Wilson, Jr. are AdCom Members at Large for 1999-2000.

## Highlights of the October 1998 AdCom Meeting

The Administrative Committee of the Power Electronics Society held its annual fall meeting in San Francisco, California, USA, On October 4. Action items coming out of the meeting are:

- Dusan Borojevic will prepare a membership survey for circulation to designated members and nonmembers of PELS.
- Bill Dunford will complete a best chapter award form and provide it to Tom Wilson, Sr. for submission to IEEE.
- Kay Smedley will prepare a report on passage of amendments to the Constitution and Bylaws dealing with standing committees and eliminating the Society Secretary position.
- Borojevic and Dunford will survey Society Chapters for interest in translating the PELS membership brochure into languages other than English.
- Jerry Hudgins will seek information from IEEE technical societies regarding policies and programs dealing with intellectual property issues.
- Hudgins will contact Randy Frank regarding PELS participation in the new IEEE Intelligent Transportation Systems Council.

## Ken Watson 1929-1998

*by Ed and Joy Bloom*

We have been informed by the family of Ken Watson that he passed away in Gainesville, Florida, on the morning of December 15, 1998. Ken was 69, and suffered from Parkinson's disease for many years. Ken's family also asked us to pass this information on to the power electronics community, since he had many friends in both industry and in academia. For those of you who may have not known Ken professionally, he was a retired faculty member of the Electrical Engineering Department of the University of Florida.

Ken began as a member of that faculty in the late 1960s. He was the author of the classic text on magnetism, *Applications of Magnetism*. Ken was an active supporter of continued education for engineers in the field of magnetism, and was a teaching associate to our company in the 1980s. His contributions to the profession of power electronics and his educational support will be greatly missed. Ken's family requests that expressions of sympathy be in the form of contributions to the National Parkinson's Foundation Inc., 1501 NW 9th Avenue (Bob Hope Road), Miami, FL 33136, or to the Sierra Club Foundation, Florida Chapter Account, 220 Sansome Street, Suite 1100, San Francisco, CA 94104.

- Kevin Fellhoelter will contact IEEE regarding Society involvement in a battery conference which has never contacted PELS for sponsorship.
- Laura Steffek will arrange to ship Society archival materials to the University of Illinois.
- Steffek will invite a representative of the IEEE History Center to address the PELS AdCom at its winter meeting; a joint presentation to PELS and IAS will be explored.

**Start planning now to attend**

**PESS99**

**Charleston, South Carolina**

**Charleston Place**

**Orient-Express Hotel**

**June 27-July 1, 1999**

## Meetings of Interest to PELS Members

**APEC® '99, 14th Annual IEEE Applied Power Electronics Conference**, sponsored by the IEEE Power Electronics Society, the IEEE Industry Applications Society, and the Power Sources Manufacturers Association, will be held at the Adam's Mark Hotel, Dallas, Texas, USA, March 14-18, 1999. See pages 4 and 5 of this *Newsletter* for details.

**INTELEC® 99, the 21st International Telecommunications Energy Conference**, is set for June 6-9, 1999 at the Falconer Center in Copenhagen, Denmark. See page 3 of this *Newsletter* for additional information.

**PESC® '99, 30th Annual IEEE Power Electronics Specialists Conference**, will be held June 27-July 1, 1999, at the Charleston Place Orient-Express Hotel, Charleston, South Carolina, USA. PESC '99 is sponsored by the IEEE Power Electronics Society. See pages 1, 6 and 7 of this *Newsletter* for additional information.

**ISIE '99, 1999 IEEE International Symposium on Industrial Electronics**, will be held in Bled, Slovenia, 12-16 July 1999. The symposium is sponsored by the IEEE Industrial Electron-

ics Society and the Slovenia Ministry of Science and Technology. Paper summary submissions were due by 1 December 1998. Visit web site <http://www.ro.feri.uni-mb.si/ISIE99/> for additional information.

**PEDS '99, Power Electronics and Drive systems**, is scheduled for July 26-29 in Hong Kong. It is organized by the IEEE Hong Kong Section and the Joint Chapter of the IEEE Power Engineering, Industry Applications and Power Electronics Societies, in cooperation with the IEEE Singapore Section and the IEEE Power Electronics Society. See page 8 of this *Newsletter* for more details.

**EPE '99, 8th European Conference on Power Electronics and Applications**, sponsored by the European Power Electronics and Drives Association, is scheduled for September 7-9, 1999, in Lausanne, Switzerland. See page 9 of this *Newsletter* for the Call for Papers.

**COBEP '99, 5th Brazilian Power Electronics Conference** will take place September 19-23, 1999, in Foz do Iguacu, State of Paraná, southern Brazil. It is organized by the Brazilian

Power Electronics Society (SOBRAEP) and by the Federal University of Paraná and Federal University of Santa Maria, Brazil. See page 6 of this *Newsletter* for more information.

**AFRICON '99, "Electrotechnical Services for Africa,"** sponsored by Region 8 of the IEEE, is scheduled for September 29 to October 1, 1999. See page 7 of this *Newsletter* for more information.

**PESC® '2000, the 31st IEEE Power Electronics Specialists Conference**, sponsored by the Power Electronics Society, will be held June 18-23, 2000, at the National University of Ireland, Galway, Ireland. For advance information of this conference visit <http://pesc00.ucg.ie/pesc00/>.

**IPEMC '2000, 3rd International Power Electronics and Motion Control Conference**, sponsored by the China Electrotechnical Society and the National Nature Science Foundation of China, in cooperation with the IEEE Power Electronics Society and the IEEE Beijing Section, is set for August 15-20, 2000, in Beijing China. See article on page 11 of this *Newsletter*.

The INSTITUTE OF ELECTRICAL & ELECTRONICS ENGINEERS, Inc.

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Make your plans now  
for

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Dallas, Texas USA

March 14-18, 1999

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