

President's Message

To begin with a personal note, it has truly been my honor and pleasure to serve as PEELS President for the past two years. Working closely with colleagues in many different capacities in IEEE has been a great experience. The AdCom of PEELS is a large (43 member) body of diverse, dedicated, and always opinionated, PE professionals. I can honestly say that I will miss presiding over the never-a-dull-moment AdCom meetings. I look forward to my continued role as Past-President in long range planning for our Society.

Congratulations to Dean Patterson as our new incoming President for 2003! After having worked closely with him in PEELS for some years, I can tell you that Dean is an innovative, dynamic, and energetic individual. I am sure that Dean would welcome your input and participation in the wide range of PEELS activities. If you have ever considered becoming an active volunteer, now is the time to get involved.



As has been evident in previous issues of this newsletter, one of the most exciting areas of change and growth in PEELS is in publications. The editor-in-chief of our new PEELS Letters, Phil Krein, has assembled an excellent editorial board and is already seeking short, timely technical papers for next year's inaugural issue. Daan van Wyk has already taken over the editorship of our Transactions from Art Kelley. We all owe Art our deepest heartfelt gratitude for a job very well done. He single-handedly moved the review and correspondence processes of the Transactions into the electronic age. Even this newsletter is scheduled for some revamping. We are in the planning to expand the newsletter from the current 12 page format to 20 pages. The additional pages will contain technical articles geared toward practicing engineers in power electronics. Juan Balda of the University of Arkansas has agreed to take on the position of Newsletter Associate Editor for Technical Content. Juan is more than interested in receiving your contributions of practical articles on design, "Tricks of the Trade," patent

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Schools Compete in Future Energy Challenge

The proposals have been evaluated, and the schools have been selected. The 2003 International Future Energy Challenge (FEC) is now under way!

Nineteen College and University teams from recognized engineering programs around the world have embarked on the task of developing low-cost electrical-energy-related design innovations that have broad potential for the future. The teams are vying to share in the \$125,000 prize money.

The FEC <<http://www.energychallenge.org>>

is an international student competition for innovation, conservation, and effective use of electrical energy. This large-scale, power-electronics-oriented, student-design competition is the result of collaborative efforts between the Institute of Electrical and Electronics Engineers (through the PEELS, IAS, PES, and IES societies), the Department of Energy (DOE), and the Department of Defense (DOD). The objective is to introduce engineering design innovations that can demonstrate dramatic reductions in cost and residential electricity consumption or that can lead to the best use of electrical energy in newly connected homes in developing nations.

Students submitted proposals on two broad topics. Topic A involves the development of a low-cost, dc-to-ac converter for fuel cells. The objective is to design elegant, manufacturable systems that would reduce the costs of commercial interface systems to \$40 per kilowatt or less, thereby accelerating the deployment of distributed generation systems in homes and buildings. A full prototype inverter is sought that leads to a practical, cost-effective hardware system. Testing and the final competition will occur at the National Energy Technology Laboratory (NETL) in Morgantown, WV on May

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Nominations Sought for Society Awards

The Power Electronics Society seeks your nominations for the three PEELS major awards for 2003. All nominations must be received by the Awards Committee Chair by January 15, 2003.

The year 2003 marks the seventh year for our two youngest awards: the PEELS Distinguished Service Award and the Richard M. Bass Outstanding Young Power Electronics Engineer Award. The William E. Newell Power Electronics Award will be presented for the twenty-seventh year.

The nomination and selection procedures for the three awards are similar. For each award, a Nominating Committee is responsible for identifying worthy candidates.



Additionally, a general solicitation of nominations is made through this Newsletter article. A separate Selection Committee then ranks all the nominees in priority order. If there are more than three candidates, a second ballot is prepared with the top three candidates from the first ballot. Both ballots are tallied using an arithmetically averaged process with priority weighting.

The William E. Newell Power Electronics Award is given for outstanding career achievement in power electronics. It is dedicated to the memory of Dr. William E. Newell of the Westinghouse Research and Development Center in Pittsburgh, Pennsylvania USA. The recipient is judged to have made outstanding contributions to the multidisciplinary field of power electronics

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Reminder: New Email Address for Newsletter Editor

The PELS *Newsletter* Editor has a new functional email address (see masthead on this page). It provides two main benefits: (1) it is a stable — and hopefully, easily remembered — address that does not change when an editor retires or changes email service providers; and (2) the editor can easily sort newsletter email from other personal and business email. Please take a moment now to update your email directory with the new address, and you should never have to change it again.

Gene Wester, editor
pelsnews@ieee.org

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<http://www.pels.org>

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News items should be sent to: Gene Wester, Editor, PELS Newsletter, Jet Propulsion Laboratory, M/S 303-300, 4800 Oak Grove Drive, Pasadena, CA 91109-8099, USA; TEL: +1 818 354 3489; FAX: +1 818 393 4272; EMAIL: pelsnews@ieee.org. Deadlines for copy are March 15, June 15, September 15 and December 15. Submission of items by email in plain-text format is preferred. Plain-text (straight ASCII) submissions on 3.5" diskettes are welcome, and should be accompanied by a backup printout. 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 both high-quality hard copy and RTF format file.

The editor gratefully acknowledges the Jet Propulsion Laboratory for significant support of his editorial activities.

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PELS Transactions Changes Editor

The three-year term of PELS Transactions Editor in Chief (EIC) Arthur Kelley is coming to an end. Daan van Wyk has been named as the new EIC.

Transfer of records from one EIC to the next is a huge problem, so the outgoing and incoming EICs will overlap for a transitional period of time. During this transition authors should communicate with a single EIC, as determined by the date their paper is first submitted to the Transactions.

- For papers that are submitted on or after October 1, 2002 communicate with the incoming EIC:

J.D. van Wyk
 Editor in Chief - PELS Transactions
 Center for Power Electronics Systems
 667 Whittemore Hall
 Blacksburg, VA 24061-0179 USA
 Phone: +1 540 231-7497
 Fax: +1 540 231-6390
 Email: peleditor@ieee.org

- For papers that were first submitted before October 1, 2002 communicate with the outgoing EIC:

Arthur Kelley
 Editor in Chief - PELS Transactions -
 2000-2002
 Linear Technology Corporation,
 Raleigh Design Center
 15100 Weston Parkway, Suite 202
 Cary, NC 27513 USA
 Voice: +1 919 677-0968
 Fax: +1 919 677-9814
 Email: peleditor@ieee.org

Note that during the transition the two EICs will share the e-mail address peleditor@ieee.org so that it need not be changed as part of the transition.

The requirements for submitting papers to the Transactions are found at <http://www.pels.org/Comm/Publications/Transactions/Transactions.html>.

Become an IEEE Senior Member

The Power Electronics Society is conducting a drive to nominate new IEEE Senior Members from our Society. The requirements for Senior Membership are (a) ten years of professional practice and (b) five years of significant performance, such as substantial job responsibilities. If nominated by PELS, you need only two additional references (senior members who sponsor you), and we can help you find them.

For further information, please contact Enrico Santi, PELS Membership Chair, at esanti@engr.sc.edu.

Online Article Purchase Now Available In IEEE Xplore™

Individual IEEE articles from any available IEEE conference proceeding or journal may now be purchased online through IEEE Xplore™. Members may purchase one-time access to articles with a credit card for US\$13 (US\$35 for non-members). The service does not include IEEE Standards, which can be purchased through the IEEE Catalog & Store.

To use IEEE Article Purchase Online, visit <http://www.ieee.org/ieeexplore>. For more information, contact Barbara Soifer, IEEE Sales & Marketing, b.soifer@ieee.org.

IEEE Members Recruiting Incentives

The annual IEEE Member-Get-A-Member and Student-Get-A-Student recruitment campaigns launched 1 Sept. The campaigns, which will run through the 2003 dues year, are designed to encourage members to recruit their colleagues for IEEE membership. Recruitment incentives include credit vouchers toward IEEE dues, IEEE Society fees, IEEE products and services, and a chance to win one free year of IEEE membership.

For more information, visit <http://www.ieee.org/organizations/rab/md/mgm.html>.

Scheduled Outage of IEEE Conference Search

On 18 November, the IEEE ConferenceSearch <http://www.ieee.org/conferencesearch/> will be unavailable while a database management server program is upgraded. The upgrade is scheduled to begin at 5PM EST and anticipated to take 8 hours to complete. Any updates regarding this upgrade plan will be posted on the IEEE ConferenceSearch web page.

For additional information, contact James Taylor, IEEE Technical Activities, +1 732 562 3865, j.taylor@ieee.org.

Quicker News Delivery

The *Power Electronics Society Newsletter* is available on the internet in PDF format approximately three weeks sooner than hardcopies can be printed, labeled, and delivered by postal mail. To receive email notification when the newsletter is posted on the PELS server, go to <http://www.pels.org/Mailing/MailForm.html> and add your name to the notification service list.

Women in Technology: New Exhibit in IEEE Virtual Museum

The IEEE Virtual Museum has a new exhibit, "Powering the Electrical Revolution: Women and Technology." The exhibit highlights the direct contributions made by such well-known women as Ada Lovelace and Grace Hopper, but also focuses on women who worked as telegraph and telephone operators, factory workers for electrical manufacturers, computer programmers, and as consumers of electric products. It also examines women's present and future involvement in technology.

To view the exhibit, visit <http://www.ieee.org/museum>.

Historic Archive Added To IEEE Xplore™

In January, the IEEE will add select content from 1952 to 1987 to IEEE Xplore™, which currently contains only periodicals and conference proceedings published from 1988 forward.

Twelve IEEE societies have provided legacy content. Subscribers to the IEEE/IEE Electronic Library (IEL) and IEEE members with online subscriptions to the contributing publications will have access to this material.

For a list of the periodical and conference content that will be added, visit http://www.ieee.org/products/onlinepubs/0902_05.html.

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views, new product reviews, etc. There are even exciting happenings for the Transactions. A special issue entitled Digital Control in Power Electronics and Drives will be published next Spring. We are planning to have future special issues on Power Electronics for Distributed Generation in 2004, and Integrated Power Electronics in 2005. Each of these special issues is organized by a guest editor, and is coordinated through the technical committees of our Society. Many thanks to our Publications Chair, Ron Harley, for his leadership and guidance in all the activities mentioned above. We all stand to benefit from the hard work of everyone involved with PELS publications.

In closing, I have found my more active involvement with PELS surprisingly rewarding. I would recommend it to you all.

Tom Habetler
thabetler@ee.gatech.edu

\$30,000 NSF Grant for an Online Reference Guide on Power and Energy

A \$30,000 National Science Foundation grant has been awarded to IEEE Educational Activities as seed money for an introductory online Reference Guide on Power and Energy. The new Guide will be developed by the IEEE Virtual Community on Power and Energy and be posted at its website, www.ieee.org/virtualcommunities/power.htm. It will be suitable for both a non-technical and technical audience, providing information, research, and curricula in the power and energy fields.

Initially focusing on the non-technical audience, the Guide will stress the interdisciplinary nature of power and energy. Information on how the fields interact with law, economics, and other fields of engineering will be included. Additionally, it will enumerate a set of learning objectives indicating what the technologically literate person should know about these fields.

The Project Team designing the Guide will be drawn from the present members of the IEEE Virtual Community, and will work with volunteers through IEEE Technical Societies, including Power Engineering, Industry Application, Industrial Electronics, Communications, Computing, and Neural Networks. It will draw from both university and non-university sources for contributions.

The pilot of IEEE Virtual Community on Power and Energy was introduced Spring 2002. Hallmarks of the service are the ability for members to consult world-wide with colleagues and receiving current and cutting edge information in their fields.

For more information on the project or on the IEEE Virtual Community on Power and Energy, contact Jill Bagley, Educational Activities New Products Manager, j.bagley@ieee.org.

Drexel University joins IEEE Education Partners Program

Drexel University, Philadelphia's technological university, has become the newest IEEE Education Partner. IEEE members can now continue their life-long learning with selected graduate-level, credit courses provided online by Drexel at a 10% discount. Current online programs offered to IEEE members through Drexel e-Learning, the university's online subsidiary, include Masters of Science in Information Science/Sys-

tems and Management and Certificate Programs.

In 2000 Drexel became the first major U.S. university to operate a fully wireless CyberCampus. The e-Learning program draws on Drexel's 110-year tradition in preparing engineers for successful careers. Drexel is one of America's leading private, non-profit academic and research institutions.

Applications, course prerequisites, and systems requirements are detailed at the Drexel-supplied website for IEEE members. You must use your IEEE member number to receive the 10% discount.

Enter through the IEEE Educational Partners, <http://www.ieee.org/EduPartners>, and choose Drexel from the university partners. To learn more about the IEEE Education Partners Program contact Sasha Eydlin, IEEE Educational Activities, s.eydlin@ieee.org.

Tell Your Local Schools about the 2003 IEE Faraday Lecture North American Downlink

It's time to get the 2003 Institution of Electrical Engineers (IEE) Faraday Lecture on your local school schedule. Many North American schools and school districts depend on the Lecture to enhance their science and technology curricula. Let your local school know that this is available from IEEE.

"Fighting Crime with Science: Footprints, Fingerprints, and Forensics," the live 2003 IEE Faraday Lecture will be available for downlink from Educational Activities on 4 February 2003 at 1:00 p.m. EST.

The 2003 IEE Faraday Lecture explores the role of science and technology in the arena of crime detection and prevention. Taking the unique form of a murder investigation, the Lecture will involve the onsite audience, using them as onstage witnesses, suspects, and investigators. The event will use optics to construct a 3D computer model of the crime scene, look at how suspects can be identified by DNA and other forensic techniques. The Lecture is a joint production by IEE and the Engineering and Physical Sciences Research Council of Great Britain.

The 2003 Faraday Lecture will be simulcast live to both C-band and KU-band satellites. For more information on how to receive this broadcast contact Celeste Torres, c.torres@ieee.org, or go to www.ieee.org/eab/precollege/faraday.

Director Report: Division II

I am writing to provide all PELS members with an update on key actions taken by the IEEE Board of Directors at its most recent meeting in Toronto, Canada, on June 23, 2002, and further developments since that time.

IEEE 2002 Budget Status

The 2002 budget calls for IEEE overall to show an Operations surplus (including initiatives spending) of US\$761K (0.3%) out of a total Operations budgeted revenue of US\$227M. This 2002 budget is a significant improvement compared to the 2001 budget when the Operations resulted in a deficit of \$10.8M. As a reminder, the Operations budget includes all IEEE revenue and expense items within IEEE outside of investments and a few other minor things.

The IEEE financial forecast for 2002 based on the June year-to-date financial results predicts that IEEE will be approximately \$2.0M favorable to the IEEE net budget. This net number consists of two parts: \$2.4M favorable to the IEEE Operations budget, offset only partially by (\$0.4M) unfavorable to the IEEE Initiatives budget. The budget has been adjusted to include the cost (\$408K) of the BDO Seidman Infrastructure Study requested by the societies and approved by the Board in June. More details about this study and its status are provided below.

Looking more closely at the financial results to date as they affect the Societies, here are a few observations:

- Conference attendance and revenue is notably down by (\$2.2M) compared to budget.
- Magazine advertising and Non-Member Subscriptions are down by (\$1.4M).
- Electronic publications revenue is flat, with growth in IEL being almost exactly offset by shrinkage in the ASPP and Conference Publications (Book Broker) revenue.

Fortunately, these negatives in the society budgets are more than offset by a variety of positive variances to the IEEE Operations budget (many dealing with IEEE headquarters expenses) which will directly benefit the societies by reducing their infrastructure charges. That being said, the financial health of each society depends on its individual circumstances.

Staffing within IEEE is being carefully controlled and now stands at approximately 850 full-time-equivalent (FTE) staff com-

pared to an authorized total of 910 FTE. Additional cuts in IEEE infrastructure costs have been approved by the Board of Directors that will result in further staff reductions and other savings. The major impact of these savings will occur in 2003, but some limited benefits may affect the 2002 budget results. More discussion of these cuts is provided in the section discussing the 2003 IEEE budget.

It is important to recognize that this IEEE net budget described above does not include any effects of the rise or fall of IEEE's investments, except for dividends and interest which can be predicted with some accuracy. Market performance through 30 July was approximately minus 8%.

Budget Principles and Initiatives Process

The Board of Directors approved a set of principles that will govern the development of the 2003 IEEE budget, and these principles will likely provide the basis for future year budgets as well. Key principles include:

- the separation of investments from the Operations budget
- the allocation of all dividends and interest to pay for new and continuing initiatives
- the commitment to develop an overall Operations budget for IEEE as a whole that is breakeven or better
- a requirement that each individual Organizational Units (including societies) develop a budget that, after allocation of all overhead charges, is breakeven or better (i.e., no deficit)
- Investment returns less than 5% will be used to offset infrastructure charges, while returns greater than 5% will be returned proportionally to Organizational Units (including societies) with reserves

A timetable was approved for development of the budget that insures that these principles are reviewed and approved by the Board early in the process so that the IEEE Financial Committee will have sufficient time to develop a budget that meets those principles.

Separately, an initiatives process was approved that calls for all initiatives greater than US\$50K be reviewed and approved



through a competitive proposal process that will include a committee of volunteers to review the proposals and make choices. The progress of continuing initiatives will also be evaluated by this committee as part of the process to determine whether funding should be continued, and how much.

IEEE 2003 Budget

Efforts are under way to develop the IEEE Operations budget for 2003. Results of this budget exercise to date indicate that 2003 may be another difficult year because of continued softness in world economies that will restrain conference attendance and subscriptions. Based on these indicators, the Board approved the following actions at the Toronto meeting in June:

- Infrastructure costs are being reduced by more than US\$5M. These cuts are being selected to minimize their impact on member services, but they are sufficiently substantial that some effects will be noticeable. These cuts will involve staff reductions and several other streamlining steps to reduce expenses.

- Dues are being raised by US\$9 from \$101 to \$110. The majority of this increase (US\$7) will be specifically dedicated to reducing infrastructure costs, with the majority of this benefit flowing to the Societies. In addition, the IEEE-USA assessment will be raised by \$2 to US\$31, with \$1 of this increase going to ABET support. A difficult decision was made to raise student dues substantially from \$US19 to \$US30 in Regions 1-7, and from \$14 to \$25 in Regions 8-10. In addition, the graduated dues increase following graduation has been significantly reduced so that students will pay 50% of regular dues for one year following their graduation and 100% thereafter. These student dues decisions were based on a combination of factors including the low conversion rate from student membership to regular membership that presently occurs following graduation (<20%), and the sticker-shock that presently results from the large difference between student and regular member dues. It is projected that this dues increase will cause a loss of 17.5% of the student members.

The net effect of these expense cuts and dues revenue increases is that conditions look favorable for a 2003 Operations budget that is at least breakeven and more likely showing a small surplus. There is hope that this situation will improve further if economic conditions improve in the US and elsewhere.

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Book Review: *Control in Power Electronics: Selected Problems*

Edited by **Marian P. Kazmierkowski**,
Warsaw University of Technology, Poland
Academic Press, USA, 2002
Hardcover, 518 pages
ISBN 0-12-402772-5

Reviewed by **Ned Mohan**

This new and excellent monograph, with contributions from highly respected researchers and educators in the field of power electronics, presents the latest concepts and basic electrical drives and power electronics technology including Matrix and Resonant Converters, Vector and Direct Torque Control of AC motors, Neural Network and Fuzzy Logic based controllers, PWM rectifiers as well as Wind Turbine systems. The book is the result of cooperation initiated in 1997 between Danfoss Drives A/S and the Institute of Energy Technology at Aalborg University, Denmark, and is known as The International Danfoss Professor Program [1].



The chapters of the book are divided into three parts and their contributions can be summarized as follows.

Part I: PWM Converters: Topologies and Control

Chapter 1: "Power Electronic Converters," A. M. Trzynadlowski of Nevada University, Reno, USA

Chapter 2: "Resonant DC Link Converters," S. Munk-Nielsen of Aalborg University, Denmark

Chapter 3: "Fundamentals of the Matrix Converter Technology," C. Klumpner and F. Blaabjerg of Aalborg University, Denmark

Chapter 4: "Pulse Width Modulation Techniques for Three-Phase Voltage Source Converters," M. P. Kazmierkowski and M. Malinowski of Warsaw University of Technology, Poland, M. Bech of Aalborg University, Denmark

Part II: Motor Control

Chapter 5: "Control of PWM Inverter-Fed Induction Motors," M. P. Kazmierkowski of Warsaw University of Technology, Poland

Chapter 6: "Energy Optimal Control of Induction Motor Drives," F. Abrahamsen of Aalborg University, Denmark

Chapter 7: "Comparison of Torque Control Strategies Based on the Constant Power Loss Control System for PMSM," R.

R. Krishnan,
Virginia Tech, Blacksburg VA, USA

Monajemy of Samsung Information Systems America, USA, and R. Krishnan of Virginia Tech Blacksburg, USA

Chapter 8: "Modeling and Control of Synchronous Reluctance Machines," R. E. Betz of Newcastle University, Callaghan, Australia

Chapter 9: "Direct Torque and Flux Control (DTFC) of AC Drives," I. Boldea of Timisoara Politehnic University, Romania

Chapter 10: "Neural Networks and Fuzzy Logic Control in Power Electronics," M. P. Kazmierkowski of Warsaw University of Technology, Poland

Part III: Utilities Interface and Wind Turbine Systems

Chapter 11: "Control of Three-Phase PWM Rectifiers" M. Malinowski and M. P. Kazmierkowski of Warsaw University of Technology, Poland

Chapter 12: "Power Quality and Adjustable Speed Drives," S. Hansen and P. Nielsen of Danfoss Drives A/S, Denmark

Chapter 13: "Wind Turbine Systems," L. Helle and F. Blaabjerg of Aalborg University, Denmark

Various advantages of the book are as follows:

- Description and implementation aspects of matrix converter,
- PWM techniques with special emphasis on variants of space vector modulation (SVM) and its relations to carrier-based PWM,
- In addition to conventional field-oriented-control (FOC) and direct torque control (DTC), presentation of modern nonlinear control methods like feedback linearization control (FLC), multiscalar control, and passivity-based control (PBC) of induction motor is presented,
- A comparison of energy saving control of induction motor with special emphasis on HVAC applications,
- Discussion of DTC for IM, PMSM, RSM and CSI-fed large SM,
- Various applications of Neural Networks, fuzzy logic and neuro-fuzzy in Power Electronics,
- Classification, in relation to PWM-inverter-fed AC motors, of PWM rectifiers,
- Discussion of mixing single- and three-phase nonlinear loads for power quality,

Frede Blaabjerg
Aalborg University, Denmark

- Review of different converters and control systems for wind turbine systems.

Above advantages aside, just the list of selected references included for each topic is worth the price of this book. However, certain important topics, such as control of power filters, FACTS, and power conditioners as well as switched reluctance motors are missing.

The book has strong monograph attributes; it provides in-depth, cutting-edge treatment of selected topics with lots of references. In addition, some of the chapters (e.g., Chapters 4, 5 and 9-11) can also be used for undergraduate education as they contain a number of illustrative examples and simulation case studies.

I strongly recommend this new attractive monograph as a reference book to wide audience of engineering educators, researchers and students. Also, practicing engineers in the industry will gain valuable insight on the topics of control in power electronics and drives.

*Ned Mohan, IEEE Fellow
University of Minnesota, Minneapolis,
USA*

- [1] F. Blaabjerg, M. P. Kazmierkowski, J. K. Pedersen, P. Thogersen, and M. Toennes, "An Industry-University Collaboration in Power Electronics and Drives," *IEEE Trans. on Education*, Vol. 43, No. 1, Feb. 2000, pp. 52-57.

Ned Mohan is Oscar A. Schott Professor of Power Electronics at the University of Minnesota, where he has been teaching since 1976. He has numerous patents and publications and has written three books in the field of power electronics.

Editor's note: Believing there is value from personal referrals in selecting great books from among the good, we are publishing a series of technical book reviews in the PELS Newsletter. You are invited to contribute a book review to the series. Please send the editor a short prioritized list of outstanding technical books that you would be willing to review and share with your colleagues. See page 2 for address.

PESC '02

Website Updated

The PESC '02 website has been updated with the General Chair's summary comments, the Australian Chief Scientist's plenary address, and selected photographs. See <http://www.pesc02.com/> for details.



CALL FOR PAPERS IEEE SDEMPED '03

Atlanta, Georgia, August 24-26, 2003

4th IEEE International Symposium on

Diagnostics for Electric Machines, Power Electronics and Drives



GENERAL CHAIRS

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Atlanta, USA
tom.habetler@ece.gatech.edu

Ron G. Harley
Georgia Institute of Technology
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ron.harley@ece.gatech.edu

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SECRETARIAT

Bob Myers
IEEE
bob.myers@ieee.org

**Sponsored by the IEEE Power Electronics Society
Technical Co-Sponsor: IEEE Industry Applications Society**

The purpose of this symposium is to provide a forum for presentation and discussion of state-of-the-art diagnostics and monitoring for electric machines, power electronics, and adjustable speed drives and related areas. Topics within the scope of the symposium are:

I. ELECTRIC MACHINES: Failure detection and location in electric machines using vibration, audible noise, electrical or mechanical variables, sensors, insulation failures, electrical, mechanical and thermal models

II. POWER ELECTRONICS: Diagnostics in power converters using input-output monitoring, thermal and/or electrical measurements on power semiconductors, control supervision, signal processing

III. ADJUSTABLE SPEED DRIVES: Monitoring and diagnostics for ASDs using electric machines, power converters and control systems supervision, computer-based signal processing, and data analysis

IV. TOOLS FOR DIAGNOSTICS: Neural networks, fuzzy logic, artificial intelligence, genetic algorithms, expert systems, identification, new signal processing techniques, observers

V. MATERIALS FOR ELECTRIC MACHINES: Insulating and magnetic materials, remaining life models, ageing tests

VI. TESTS FOR PREDICTIVE MAINTENANCE: Partial discharge analysis, tests, new instruments for diagnostics

Regular papers: Submit Digests in English as follows: *First page:* title, author's names, mailing address, phone, fax and e-mail of each author, the corresponding author and the Preferred Topic Area. *Second page:* title, author's affiliations, keywords and a 200 word maximum abstract. *Third and following pages:* summary limited to 4 pages including figures and references. Each accepted paper must be presented at the symposium within a 20 minute period and the final manuscript must be accompanied by paid registration.

Special sessions: The symposium will feature special sessions on topics of special interest. The proposal of a special session must provide the session name and a list of about 5 potential papers together with their digests. All special session papers will be reviewed in the usual way.

All submissions should be in electronic form. More information is available on the web at <http://www.dimie.uniovi.es/sdemped.html> or <http://www.dimie.uniovi.es/sdemped03.html>

Venue: Evergreen Conference Resort, Stone Mountain State Park, Stone Mountain, Georgia.
www.evergreenresort.com

Deadlines for paper digest and special session proposal

Submission:	December 1, 2002
Notification of acceptance:	February 15, 2003
Final manuscript due:	April 30, 2003

PWM Session Report on Energy Storage Technology

A Problem-Wisdom-Matching (PWM) session was organized at the PESC'02 conference at Cairns, Australia to address battery and/or energy storage technology. Particular attention was given to supercapacitors (double-layer capacitors), which have greatly increased energy density over ordinary capacitors and much better cycle life compared to batteries. The session was organized by Rik De Doncker, RWTH-Aachen, Germany. Additional panel speakers



consisted of Pierre Mars, Applications Engineering Leader at Cap-XX, Australia, and Dean Patterson, PESC'02 conference chair and professor at the University of South Carolina, USA.

This PWM session was well attended (about 100 persons), and discussions continued well beyond the planned two-hour time slot.

Pierre gave an interesting perspective on the market niche for small supercapacitors in power supply applications. He explained that the undervoltage detection circuit in many battery-fed systems prematurely shuts down power under transient load conditions due to high battery impedance. Supercaps can avoid premature shut down in these applications because they have lower internal impedance and hold voltage up better during pulsed or transient conditions. Further information can be obtained at <http://www.cap-xx.com>.

Rik presented a new physics-based supercap modeling technique. Impedance spectroscopy, a method used to characterize and model batteries, can be used to accurately model supercaps. The models are valid in steady-state and transient conditions (see <http://www.isea.rwth-aachen.de>, contact bu@isea.rwth-aachen.de).

New materials and energy storage devices were presented by Dean (see <http://www.ee.sc.edu/EEResearch.htm>), who also argued that the concept of paralleling supercaps, rather than connecting them in series, may be economically viable today. In any case, more redundancy is provided.

Questions were asked with respect to the technical capabilities of supercaps and the voltage balancing circuits needed to reliably operate a supercap system. Ragone

diagram supported the general consensus that supercaps offer major benefits in new applications, such as mild hybrid vehicles, if more integration of electronics and a reduction of cost can be realized.

In conclusion, it was felt that the PWM session was successful and that future PELS conferences should devote more time (sessions) to the topic of electrical energy storage.

Rik DeDoncker
Chair, PESC'02 PWM Energy Storage Session
Director, RWTH-Aachen, Germany
dd@isea.rwth-aachen.de

Director's Report from page 4

IEEE Infrastructure Study

Last year 24 Society Presidents joined to write a letter to the IEEE President (then Joel Snyder) requesting that an external consultant be retained to review IEEE's infrastructure to identify improvements that can be made that would significantly increase efficiency and lower costs. President Snyder agreed, and an RFP process was initiated to hire a suitable consultant. That process came to a conclusion in June when BDO-Seidman was selected as the best choice among 4 final bidders.

BDO-Seidman staff are now working on a fast track to complete the study in time to present their final results to the Board at the upcoming November 17 meeting. The work is being conducted by a team of 9 BDO-Seidman consultants. By mid-August they had conducted initial interviews with 25 department staff, 9 Society Executive Directors, and 20 past and present volunteer officers. In addition, they are reviewing many IEEE documents in order to understand IEEE's present infrastructure configuration and all of its ramifications. Their final report will be circulated to key Society officers in addition to Board members.

Division-Elect Position Proposal

Three of the ten IEEE Technical Divisions presently have Director-Elect positions that give their new incoming Directors at least one year of advance experience with Board procedures, personalities (and politics) before they take office. I can confirm from personal experience that it takes some time to make this adjustment. This becomes a significant issue for effective operation of the Board since approximately one half of its membership turns over each year.

Since Division II presently does not have a Division-Elect position, I would like

to raise this issue for consideration. Enactment would require agreement of all four Societies that make up Division II (PELS, IAS, DEIS and I&MS). No explicit proposal is being made at this time, but informal feedback from all PELS members would be appreciated.

Thomas M. Jahns
University of Wisconsin-Madison
tjahns@ieee.org

Web-Based Simulation

I would like to comment about a web-based, power-electronic educational tool developed by Prof. Carlos A. Canesin, from Paulista State University - UNESP (Brazil). He developed Java Applet programs for an open WWW-HTML-based multimedia course in Power Electronics. The main purpose was to provide an interactive visual simulation and analysis of idealized uncontrolled and controlled rectifiers (single-phase and three-phase topologies). In addition, JAVA applet programs were implemented to solve some design-oriented equations for rectifier applications.

The major goal for these JAVA applets was to provide a convenient tool to enhance students understanding of power electronics. The emphasis is on interactive waveform analysis, stresses on the devices, average and rms values of main circuit variables, and additionally allowing total hands-on changes in all circuit parameters.

Simulation results may be visually presented to the learner in real time, illustrating important concepts that are difficult to grasp in traditional classes. The tool also provides conditions for on-line comparative analysis among different hands-on laboratory experiences, via a normal Internet TCP/IP connection.

By using the JAVA applets, embedded in a WWW-HTML-based course in Power Electronics, significant improvements were observed in students' perception and content learning. Therefore the lectures become smooth, and the students are motivated to apply concepts in homework and application-oriented projects.

All JAVA Applets can be accessed free of charge at <http://www.dee.feis.unesp.br/LepApplets>.

The tool is still under development and future JAVA Applet programs for main dc-dc, dc-ac, and other ac-to-dc converters will be released soon.

Marcelo Simoes
Chair, PELS Education Committee
msimoes@mines.edu

COMPEL'02 Report

During June in the wonderful atmosphere of Puerto Rico the Modeling, Simulation and Control Committee held the latest edition of the COMPEL Workshop. COMPEL — Computers in Power Electronics — is one of the traditional events of our society. The focus of this workshop was on computational science and engineering applications to the design, analysis, simulation, control, and operation of power-electronic circuits and systems.



Computation is now regarded as an equal and indispensable partner, along with theory and experiment, in the development of future generations of power-electronic systems where cost and reliability constraints will impose higher demands on the capability of power-electronic systems simulation, design and development tools to accurately predict system behavior before implementation.

In a few words, it was a great opportunity for significant scientific debate. The atmosphere, as usual, was really informal; at COMPEL there is always time for talking and asking questions. For the second time we experienced the new format: short presentations by the authors, and then an open discussion at the end of every session. The opportunity to have a deeper under-

standing of the content of a work by a colleague is really great! You do not have this kind of situation in big conferences.

This time we have to say thanks to the Chair, Dr Miguel Velez-Reyes, who managed this wonderful edition of COMPEL at the University of Puerto Rico, Mayagüez campus.

The program opened on Sunday with a great seminar by Dr. Steve Leeb on vector control and dynamic modeling of electrical machines.

In the regular sessions held on Monday and Tuesday, a total of 28 papers were presented and then discussed. The topics covered the different fields that are part of this committee interest: Control Design, Component Models, Software Tools, Drives, and for the first time an Education session where experiences from different universities were presented. The attendance was around 30 people; the majority came from the United States but a significant European presence and a Japanese professor gave the Workshop a real international level.

The next COMPEL workshop will be in two years. We are collecting proposals now, and will announce details at the beginning of next year. Wherever it will be, I strongly encourage you to join us for a very unique scientific and educational experience.

Furthermore, if you are interested in the activity of the Committee in general, do not hesitate to contact me. I will be glad to an-

swer your questions and to keep you informed about our initiatives.

Antonello Monti
Chair, PELS Simulation, Modeling, & Control

Department of Electrical Engineering
University of South Carolina
Swearingen Center
Columbia, SC 29208
Tel: +1 803 777-2722
Fax: +1 803 777-8045
Email: monti@enr.sc.edu

Education Committee

The Education Committee held a one-hour meeting at PESC 2002 in Cairns, Australia, on June 26. Chaired by Professor Issa Batarseh, the Committee brought forward the following points:

1) In general, supporting workshops by PELS is a good idea. It is recommended that an educational workshop be held in conjunction with PESC, either before or after the conference. The workshop may be held annually or every other year. The workshop should also host tutorials to cover educational activities for training purposes. Such activity will be discussed in future AdCom meetings.



2) There is a need to assess industry interest in power electronics in order to periodically develop the educational/research curriculum in power electronics.

3) There is need of a dedicated web site to present various design and self-learning tools posted by established programs for others to share.

4) More web-based educational course development should be sponsored by PELS.

5) Develop a "general" application-oriented, power-electronics tutorial course (video) to promote the field of power electronics. This will help faculty and industry engineers to reach people in the mainstream electrical engineering areas. (Comment: the Education Committee is currently pursuing a related project.)

6) To help achieve item #5, it is recommended that a complete list of power electronics applications be developed. Each participant agreed to forward a list of power electronics applications to the PELS Education Chair (see email address below).

7) A global directory of power-electronics faculty needs to be developed.

Marcelo Simoes
Chair, PELS Education Committee
msimoes@mines.edu

German Chapter Receives PELS Best-Chapter Award

The PELS Best Chapter Award — won by the German IAS-PELS-IES Joint Chapter and received by past chapter chair. Rik De Doncker at PESC '02 in Cairns Australia — was handed over to proud chapter officials at the next German chapter meeting, held July 19 at the T.U. Dresden. The picture taken to commemorate this happy event shows (left to right): Prof. De Doncker, Prof. Dierk Schroeder (chapter chair), Dr. Ingo Hahn (treasurer), Dr. Peter Magyar (chapter vice-chair), and Prof. Juergen Petzoldt, (secretary). Notice the

reaction of the chapter treasurer, who was happily surprised by the monetary award associated with the PELS Best Chapter Award! The chapter wishes to thank the PELS President and the PELS Chapter Committee Chair, Prof. J. Arau, for bestowing the award upon the German Joint Chapter.



In August the chapter decided to give part of the monetary award to the T.U. Dresden, which was hit by a major flooding disaster just one week after the chapter visit. The activities of the German Chapter can be followed at the following website: <http://www.ewh.ieee.org/r8/germany/ias-pels/>.

Energy Challenge from page 1

19-22, 2003. Topic B seeks innovations in motors and motor drive systems that produce deep cuts in losses and costs for home appliance use, or that could replace “universal motor” brush machines in residential applications. The school with the most cost-effective design that can meet or exceed the aggressive cost target and that provides a fully-functional prototype will be awarded with a large prize. Testing and the final competition will be at Advanced Energy in Raleigh, NC the week of May 21-23, 2003.

The FEC follows in the wake of the inaugural 2001 Future Energy Challenge that was successfully concluded in August 2001. A team from Texas A & M University successfully demonstrated a prototype design for a 10-kilowatt inverter that can be manufactured for less than one half the cost of today’s commercial products. The additional twenty percent cost reduction sought in this year’s competition would meet the cost target for the Solid-State Energy Conversion Alliance, a DOE fuel-cell program aimed at producing a solid-state fuel-cell module that can be produced at a cost of no more than \$400 per kilowatt.

Originally driven by the need to make inverter technology competitive and attractive for U.S. industry, the Future Energy Challenge offers a broader impact on the education of undergraduate and graduate students. The challenge brings excitement to the classroom by integrating hands-on design into the educational process. The participants learn a great deal about power electronics engineering and gain valuable practical expertise. The result will be a pool of high-quality, well-trained engineers and scientists available to help provide solutions to the world’s energy issues.

Competing schools will be judged on the basis of design quality, a formal engineering report and presentation, cost and cost analysis, prototype quality, and operational results. Now that the schools have been notified of their selection into the competition, a Future Energy Challenge Workshop will be held during the IEEE Applied Power-Electronics Conference (APEC), February 9-13, 2003, at the Fontainebleau Hotel in Miami Beach, Florida. All the accepted teams must participate in this workshop.

The organizing committee invites your financial support of the testing events, or sponsorship of one of the competing teams. For further information, contact Professor Jo W. Howze, Chairman, FEC Organizing Committee, email Howze@ee.tamu.edu.

PELS AdCom Meeting Highlights

The PELS AdCom authorized a change in the election procedures for the Society – approving a Society-wide vote for AdCom membership effective in 2003 – at its fall meeting in Montreal September 29. The day-long meeting also dealt with publications issues, including reorganization of the Society Publications Board, and recommended that PELS-related standards be posted on the website.

Here is a summary of activity at the meeting.

Motions

- Approved Society-wide election of at-large AdCom members in 2003, but with officers elected by the AdCom.
- Effective in 2004, the Society will elect officers for the following year at its first meeting of the year and will select a President-Elect.
- Approved \$20,000 in advance funding for PESC’04 in Germany.
- Authorized a special issue of the Transactions on power electronics for distributed generators to be published in the fall of 2004.
- Endorsed the Awards Committee plan to restructure the Newell Award Committee into three groups to alternate responsibility for selecting recipients.
- Approved a contract covering advertising sales for the PELS Newsletter.
- Authorized the reorganization of the Publications Committee to include the Pub-

lications Chair, Transactions Editor-in-Chief, the Associate Editor-in-Chief, Webmaster, Newsletter Editor-in-Chief, Newsletter Associate Editor, PELS Letters Editor-in-Chief, Newsletter Advertising Manager and two at-large members. Also created subordinate editorial boards for the Transactions, Newsletter and PELS Letters.

Actions

- The Awards Committee will develop a program covering new levels of cash awards for Society awards.
- Ron Harley will determine the publishing data for a special issue of the Transactions on power electronics and distributed generators and will request that the special issue editor be relieved of Associate Editor duties while he prepares the issue.
- Keyue Smedley will draft an amendment to the Society Bylaws to reflect the reorganization of the Publications Committee.
- Jason Lai will provide standards developed by PELS for listing on the Society webpage and will seek to establish a link on the homepage to the Standards Association.
- Bob Myers will distribute a reminder election ballot and seek to seek to process all votes for officers and at-large AdCom members as soon as possible.

Bob Myers

PELS Executive Director

bob.myers@ieee.org

Society Elects 2003 Officers

Dean Patterson will lead the Power Electronics Society as President in 2003, succeeding Thomas Habetler who has held that office for the past two years and moves to Junior Past President. Patterson will take office formally on January 1.

Patterson, originally from Australia and currently on the faculty at the University of South Carolina, was elected by members of the Society Administrative Committee in the annual PELS election. He had served as Vice President-Operations during 2001 and 2002.

Elected Vice President-Operations was Ron Harley of the Georgia Institute of Technology. F. Dong Tan was re-elected as Vice President-Meetings.

As Junior Past President, Habetler, of Georgia Tech. will succeed Philip Krein of the University of Illinois, Urbana, who becomes Senior Vice President. Outgoing Senior Past President is Jerry Hudgins of the

University of South Carolina.

One At-Large AdCom member, J.A.(Braham) Ferreira, was re-elected to a second three-year term and five new members were elected. They are Issa Batarseh of the University of Central Florida, Orlando; S.Y. (Ron) Hui of the City University of Hong Kong; Pallab Midya of Motorola, Inc., Schaumburg, IL; Istvan Nagy of the University of Technology and Economics, Budapest, Hungary; and Aleksander M. Stankovic of Northeastern University, Boston.

Habetler and Nominations Chair Krein expressed appreciation to the successful candidates, and to those who were not elected, for their willingness and availability to serve the Society.

Bob Myers

PELS Executive Director

bob.myers@ieee.org

Nominations Sought *from page 1* that crosses the technical boundaries of a number of societies of the IEEE. The award consists of an inscribed plaque and a cash award of \$1,750. Over a span approaching three decades, this award has come to represent the recipient's crowning achievement as a contributor to the field of power electronics. The Nominating Committee for this award is the PELS Awards Committee. The Selection Committee comprises past winners of the award.

The Power Electronics Society Distinguished Service Award is presented to a member of the Society in recognition of exceptional dedication and service to the Power Electronics Society over a substantial period. This award consists of an inscribed plaque and a cash award of \$1,200. The Nominating Committee for this award consists of all elected and ad hoc members of the PELS Administrative Committee. The PELS Awards Committee serves as the Selection Committee.

The Richard M. Bass Outstanding Young Power Electronics Engineer Award is given for outstanding achievement in the field of power electronics by an IEEE member of any grade who is less than 35 years of age on January 1, 2003. It is dedicated to

the memory of Professor Richard Bass, a former treasurer of the Society. The recipient is judged to have made an outstanding contribution to the field of power electronics. This award consists of a certificate, a cash award of \$500, and reasonable reimbursement for transportation expenses up to \$500 to attend the Annual PELS Awards Banquet. This banquet is typically held during the Power Electronics Specialists Conference. The Nominating Committee consists of the Chair of this Awards Subcommittee and six individuals appointed by this Chair. The Selection Committee comprises six past recipients of the Newell Award appointed by this Chair.

Although each of these three awards has a Nominating Committee, every member of PELS has the opportunity, and is encouraged, to nominate candidates for these awards. You may use the forms printed in this Newsletter, attaching a separate sheet summarizing the nominee's qualifications and achievements. These forms are also available at the PELS web site www.pels.org. Alternatively, you may request nomination forms and a sheet giving the details of the selection criteria and the nomination and selection procedures from the Awards Committee Chair. Please note the strict limits

on the length of each nomination. Nominations that exceed the limits will be truncated before they are submitted to the selection committees.

At the Awards Banquet, the Society will also present the PELS Transactions Prize Paper Awards to the authors of the three papers judged by the Associate Editors to be the best papers published in the PELS Transactions in 2002. A Best Chapter Award, inaugurated in 2000, will be presented to a PELS chapter. For further information regarding the latter award, please contact Professor Jaime Arau at jarau@cenidet.edu.mx.

The Institute (IEEE) also has an awards program comprising IEEE Medals, IEEE Technical Field Awards, Service Awards and Prize Paper Awards. For additional information, see the IEEE web site at www.ieee.org or send a fax to the IEEE Awards Board, Piscataway, NJ USA, +1 732 981 9019. If you wish assistance, please contact the PELS Awards Committee Chair.

*Christopher O. Riddleberger
Chair, PELS Awards Committee
497 Old Mine Brook Road
Far Hills, NJ 07931-2550 USA
Tel: +1 908 221 0013
Fax: +1 908 221 1014
Email: c.riddleberger@ieee.org*

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.

IEEE POWER ELECTRONICS SOCIETY

NOMINATION FORM

The William E. Newell Power Electronics Award

Award Year 2003

Nominated by: _____ Nominator's IEEE Member Number: _____

Nominator's FAX Number: _____ Nominator's E-mail Address: _____

Nominee's Name: _____ Nominee's E-mail Address: _____

Nominee's Business Address: _____

Nominee's Educational Background: _____

On a separate sheet or sheets of A4 or 8½"×11" paper, summarize the Nominee's qualifications and contributions to the field of power electronics. Since not all members of the Selection Committee may know the Nominee, please describe his/her most pertinent achievements and provide specific examples of outstanding accomplishments. For example, with respect to patents and papers published, their particular significance and value should be pointed out.

A strict limit of 750 words must be observed for the attached document. Nominations longer than this limit will be truncated at 750 words before they are submitted to the Selection Committee.

Please send this form and the attached sheet(s) to Christopher O. Riddleberger, PELS Awards Chair, 497 Old Mine Brook Road, Far Hills, NJ 07931-2550 USA; FAX: +1 908 221 1014; E-mail: c.riddleberger@ieee.org

This form, fully completed, and accompanying page(s) must be received by 15 January 2003.

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.

IEEE POWER ELECTRONICS SOCIETY

NOMINATION FORM

Distinguished Service Award

Award Year 2003

Nominated by: _____ Nominator's IEEE Member Number: _____

Nominator's FAX Number: _____ Nominator's E-mail Address: _____

Nominee's Name: _____ Nominee's E-mail Address: _____

Nominee's Business Address: _____

Nominee's Educational Background: _____

On a separate sheet or sheets of A4 or 8½"×11" paper, summarize the Nominee's qualifications and contributions to the Power Electronics society. Since not all members of the Selection Committee may know the Nominee, please describe his/her most pertinent achievements and accomplishments in introducing new programs, nurturing growth of individual Society members, and enhancing the reputation and stature of the Society. Provide specific examples and explain their significance.

A strict limit of 600 words must be observed for the attached document. Nominations longer than this limit will be truncated at 600 words before they are submitted to the Selection Committee.

Please send this form and the attached sheet(s) to Christopher O. Riddleberger, PELS Awards Chair, 497 Old Mine Brook Road, Far Hills, NJ 07931-2550 USA; FAX: +1 908 221 1014; E-mail: c.riddleberger@ieee.org

This form, fully completed, and accompanying page(s) must be received by 15 January 2003.

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.

IEEE POWER ELECTRONICS SOCIETY

NOMINATION FORM

Richard M. Bass Outstanding Young Power Electronics Engineer Award

Award Year 2003

Nominated by: _____ Nominator's IEEE Member Number: _____

Nominator's FAX Number: _____ Nominator's E-mail Address: _____

Nominee's Name: _____ Nominee's E-mail Address: _____

Nominee's Business Address: _____

Nominee's Date of Birth: _____ Nominee's Educational Background: _____

On a separate sheet or sheets of A4 or 8½"×11" paper, summarize the Nominee's qualifications and contributions to the field of power electronics. Since not all members of the Selection Committee may know the Nominee, please describe his/her most pertinent achievements and provide specific examples of outstanding accomplishments. For example, with respect to patents and papers published, their particular significance and value should be pointed out.

A strict limit of 600 words must be observed for the attached document. Nominations longer than this limit will be truncated at 600 words before they are submitted to the Selection Committee.

Please send this form and the attached sheet(s) to Christopher O. Riddleberger, PELS Awards Chair, 497 Old Mine Brook Road, Far Hills, NJ 07931-2550 USA; FAX: +1 908 221 1014; E-mail: c.riddleberger@ieee.org

This form, fully completed, and accompanying page(s) must be received by 15 January 2003.

Meetings of Interest to PELS Members

IECON'02, the 28th Annual Conference of the IEEE Industrial Electronics Society, is planned for November 5 – 8, 2002 in Sevilla, Spain. IECON 02 is sponsored by the IEEE Industrial Electronics Society. For further information see <http://iecon02.us.es>.

IICPE 2002, the India International Conference on Power Electronics, will be held December 16 – 17 in Mumbai, India. Visit <http://www.iicpe2002.net> for further information.

APEC[®] 2003, the 18th 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 February 9 – 12, 2003 at the Fontainebleau Hotel, Miami Beach, Florida USA. Visit <http://www.apec-conf.org> for current information.

PES 2003, the 7th IASTED International Multi-Conference on Power and Energy Systems, will be held February 24-26, 2003, in Palm Springs, California USA. Comprised of four power-related conferences, PES is co-sponsored by the IEEE Power Electronics Society. See <http://www.iasted.org/conferences/2003/palm/pes.htm> for more information.

CPE 2003, the 3rd International Workshop on Compatibility in Power

Electronics, will be held May 28 – 30, 2003 in Gdańsk, Poland. For additional information visit <http://www.cpe2003.uz.zgora.pl>. Digests are due November 15, 2002.

IEMDC 2003, the IEEE International Electric Machines and Drives Conference, is scheduled June 1 – 4, 2003 in Madison, Wisconsin USA. The IEEE Industrial Applications, Industrial Electronics, Power Electronics, and Power Engineering Societies are technical co-sponsors. For additional information visit <http://www.iemdc03.org>.

TELESCON 2003, the 4th International Telecommunications Energy Special Conference, sponsored by the IEEE Power Electronics Society, is scheduled June 8–13 in Rio De Janeiro, Brazil. See <http://www.cinintel.com.br/home.asp> or contact raul@cpqd.com.br for details.

PESC[®] 2003, the 34th Annual IEEE Power Electronics Specialists Conference, will be held June 15 – 19, 2003 in Acapulco, Mexico. PESC is sponsored by the IEEE Power Electronics Society. For additional information visit <http://www/pesc03.org>.

IPEMC 2003, the 4th International Power Electronics and Motion Control Conference, will be held August 14 – 17 in Xi'an, P.R. China. See <http://unit.xjtu.edu.cn/unit/ipemc2003/>

ipemc2003.html or contact ipemc03@mail.xjtu.edu.cn for details. The IEEE Power Electronics Society is a technical co-sponsor. Abstracts are due January 15, 2003.

SDEMPED 2003, the 4th IEEE International Symposium on Diagnostics for Electric Machines, Power Electronics and Drives, takes place August 24 – 26, 2003 in Atlanta, Georgia USA. SDEMPED is sponsored by the IEEE Power Electronics Society. See the Call for Papers in this *Newsletter* or visit <http://www.dimie.uniovi.es/sdemped03.html>. Digests and special session proposals are due December 1, 2002.

EPE 2003, the 10th European Conference on Power Electronics and Applications, takes place September 2–4 in Toulouse, France. Organized by the EPE Association, it is technically co-sponsored by the IEEE Power Electronics Society. Information can be found at <http://epe2003.inp-toulouse.fr> or contact epe-association@yub.ac.be.

INTELEC[®] 2003, the 25th International Telecommunications Energy Conference, will be October 19 – 23 in Yokohama, Japan. The IEEE Power Electronics Society is the sole sponsor in even years, and is a technical co-sponsor in odd years. Visit <http://www.intelec.org> for more information.

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