



President's Column Farewell

This is my final newsletter column at the end of a two-year term as President of the Power Electronics Society (PELS). The Society Administrative Committee (AdCom) recently elected Thomas Habetler of Atlanta, Georgia, USA as the new President for 2001. We can look forward to excellent leadership next year. During the past



two years, there has been emphasis on better value for Power Electronics Society members. Some of the changes have been subtle, such as an all-

electronic paper review process that is beginning to speed up publication of the Transactions. Others have been more evident, such as the low membership dues that include full electronic access to the IEEE *Transactions on Power Electronics*. A new product, electronic access to a suite of six journals published by IEEE societies with power electronics interests, will debut in 2001. Several useful books have been published by the IEEE Press with sponsorship by our Society. A series of international power electronics education workshops was initiated.

The Society leadership has ambitious plans for the next two years, including new types of publications and member access to our conference publications. Short courses and continuing education activities are planned. Some of the best tutorial presentations from our conferences will be reworked into web forms and stored for member access. Older conference and journal papers will be archived for electronic access. A joint membership fee with a discount rate that covers all four societies with involvement in power electronics (the Power Electronics Society, the Industrial Electronics Society, the Industry Applications Society, and the Power Engineering Society) is being negotiated and appears likely to become a product in 2002.

I appreciate your support and thoughts during the past two years, and look forward to continuing service to the Society as the Past President.

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IEEE Conference Database Now Online

The new, on-line IEEE Conference Database Search allows the public to retrieve information on any of hundreds of IEEE meetings in the Conference Database (formerly TAG). The search is located at <http://www.ieee.org/conferencesearch/>.

The goals of this search are to allow individuals to find meeting information easily, and to make it easier for members and nonmembers to attend IEEE meetings.

The improved search includes all current and future meetings that are listed in

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PESC® 01 Promotes Student Participation

APEC has traditionally had activities for students (the Micromouse) and industrial displays. PESC has concentrated more on paper and tutorial presentations, partly because it has sometimes been held in places where access by potential student groups and exhibitors would be difficult. With PESC 2001 in Vancouver we have extensive facilities at our disposal and good access to the rest of the world. We are therefore going to experiment with some new features including an industrial exhibit and tutorial session and a student competition. We have also just decided to provide a session for students which will not be part of the regular published proceedings.

The idea of this student session is to provide a forum for students, individually or in groups to present their ideas without needing to pass the normal rigorous review procedure. The work could be the early stages of a PhD or an undergraduate project and would be presented primarily to obtain constructive criticism from experts in the field. Student participation in this session and the competition is encouraged.

I am happy to announce that a local trust, the Kaiser Foundation, will provide cash prizes worth a total of \$7500 in Canadian Dollars for first and second in the student competition and the proposed student paper session. Details are available on the PESC 2001 website <http://www.conferences.ubc.ca/pesc2001>.

Bill Dunford
General Chair, PESC '01

Nominations Sought for Society Awards

The Power Electronics Society is earnestly seeking nominations for all three of the PELS major awards for 2001. All nominations must be received by the Awards Committee Chair by January 15, 2001.

The year 2001 will mark the fifth year of our two newest awards – the PELS 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-fifth 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

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Editorial

This starts my second year as editor of this newsletter, so it seems appropriate to discuss where we have been and where we are going. Again, I want to acknowledge the extensive examples, notes, and files provided by my predecessor, the founding editor Harry Owen. His vision and dedication are embodied inextricably in the newsletter you are now reading.

Tackling my first edition was a white-knuckle experience: the deadline kept advancing relentlessly as I struggled to install, learn, and apply several complex new software packages. Somehow I met the deadline and survived, and the process—while still challenging—has become more manageable with experience.

IEEE Power Electronics Society Officers

Philip Krein, President
Thomas Habetler, V. P., Operations
Kevin Fellhoelter, V. P., Meetings
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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: gwester@jpl.nasa.gov. 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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One change initiated last year was the transition from camera-ready copy to printer-ready file. The original process involved using a local pre-publication service bureau to scan pages with graphics and produce high-resolution prints, which were then added to lower-resolution, laser-printed text-only pages and sent to the publisher, who made photographic images for eventual printing. Now the process is totally electronic: the newsletter is written to a printer-ready file using the same printer driver used by the publisher, and that file is emailed to the publisher.



Another change has been the launching of a book review series. This exemplifies a determined effort of the AdCom to enhance the value of PELS membership, especially for members with limited resources who need to maximize the “bang for the buck.” The associated challenge has been to enlist guest book reviewers, which has taken an inordinate amount of my time. For this series to continue, we need experienced power electronics engineers who will volunteer to write a “cream of the crop” book review. Please contact the editor for details.

This issue has been expanded from the usual 12 pages to 16 pages to accommodate some special features. One example is the article that describes how papers are selected for one of our society’s major conferences. Depending on feedback we might publish a series of related articles to explain how a conference is created. Please let the editor know the degree of your interest in such a series.

Looking forward, we are investigating alternatives for reducing the production/mail delays encountered in distribution of individual copies. Meanwhile, members with web access can read the PDF version of the newsletter on the same day an edition is finished. If you would like to receive electronic mail notification when the latest newsletter becomes available on the Power Electronics Society server, go to <http://www.pels.org/Mailing/MailForm.html> and add your name to the notification service list.

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Conference Database from pg 1

the IEEE Conference Database. In addition, the search can look at meetings held within the past 12 months.

The search functions include selecting search fields, submitting the search, viewing the list of conferences that meet those criteria, selecting a specific meeting, and viewing the details of that meeting. Individual conference information includes all of the search fields, as well as contact information and a link to the conference URL (if available).

The search allows you to:

- identify a specific future meeting;
- identify a specific meeting held in the past 12 months;
- identify all meetings scheduled in your (or another) location;
- identify all meetings being sponsored by your Society; and
- identify meetings that will include exhibits.

Users may select one or more fields from the following list:

- month
- year
- location
- keyword in title
- city
- state
- country
- IEEE Region
- IEEE Record number
- sponsor or organizer
- exhibits included

A search help function is included with the IEEE Conference Database Search. For additional information contact Rosemary Tennis, IEEE Technical Activities, TEL +1 732 562 6524; Email r.tennis@ieee.org.

To ensure that your meetings are included in the IEEE Conference Database Search, the Conference Information Schedule form must be submitted to IEEE Conference Services. The forms are available on-line at <http://www.ieee.org/organizations/tab/confink.html>. For additional information on IEEE Conference Services, and for information on conferences held more than 12 months ago, contact Mary Ann DeWald, IEEE Technical Activities, TEL +1 732 562 3873; Email m.dewald@ieee.org.

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 Jayne F. Cerone, Editor*

PESC® 2000: Continuing a Great Tradition

The 2000 Power Electronics Specialists Conference in Galway, Ireland, was among the largest ever PESC Meetings. More than 430 delegates from 35 countries attended along with 90 guests. There were 260 papers presented at the conference, as well as four tutorials and three rap sessions. This year for the first time the PESC proceedings were printed in three volumes, reflecting the extra papers which resulted from a record 600 abstracts submitted last September.

Severe delays at Heathrow Airport on the opening weekend of the conference did not dampen the enthusiasm of the delegates who attended the Welcome Reception on Sunday night, on the Banks of the River Corrib. For many it was their first introduction to Guinness, while for many more it was a question of renewing an old acquaintance on home turf. The Mayor of Galway extended a C ad M ile F ilte (a Hundred Thousand Welcomes) to everyone. On Monday Morning the Conference was officially opened by the Irish Minister for Science and Technology, Mr Noel Tracey T.D., accompanied by the Vice President of the Univer-

sity, Prof. Ruth Curtis (see photos below).

The four tutorials on Sunday were very well attended by 140 delegates; DSP Motor Control by Finbarr Moynihan, Power Electronics Building Blocks by Ned Mohan, Power Conversion Techniques by Rudy Severns, and Three-phase Rectifiers by Johann Kolar.

The rap sessions on Tuesday evening were lively and generated plenty of controversy, covering Power Quality (Richard Redl), Packaging (Daan van Wyk), and Computing (David Hamill). Tours of Galway and its environs were organised on Wednesday afternoon and finally the rain arrived. Some delegates had been disappointed with the 30  C weather on Sunday and Monday, so now we had "typical Irish weather." The highlight of the social program was the Conference Banquet attended by 450 delegates and guests. The best of Irish food, drink, song,

and dance were featured. Many of the delegates participated in an Irish Folkdance. On Thursday evening the Cois Cladagh Choir entertained at St. Nicholas' Church, where Christopher Columbus is reputed to have visited before heading to the New World. The choir sang songs from nine countries spanning six centuries. For many delegates this concert was the highlight of their visit to Galway.

The Guest Program kicked off to a lively start on Monday morning. After an interesting Welcome Reception with guest speaker Des Kenny, from Galway's famous Kenny's Bookshop, guests were invited to participate in an Irish Set Dancing Work-

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PESC Photos (from left): Top – University VP Ruth Curtis, Irish Minister Noel Treacy, and Conference Chair Ger Hurley; Center – Eager delegates arrive early for the plenary session; Attendees and guests try Irish dancing; Bottom – Other dancers include members of 'Riverdance' and young costumed students from a dance school; Aussie prof Dean Patterson coolly takes the stage and delivers a great rendition of "O Danny Boy." Additional photos are (or soon will be) available at the PELS website <http://www.pels.org/Comm/Meetings/Conference/pesc/PESC.html> .

APEC® 2001 Expands to 198 Papers

The 16th annual Applied Power Electronics Conference and Exposition (APEC) will be held March 4-8, 2001 at the Disneyland Hotel in Anaheim, CA. The Conference is sponsored by the IEEE Power Electronics and Industry Applications Societies and the Power Sources Manufacturers Association. This triple sponsorship agreement, which began in Dallas in 1991, is now entering its second decade of mutual cooperation.

When you arrive at the conference site next year you will notice a major renovation. California Adventure, Disney's new 55-acre Anaheim Theme Park located directly across the street from our conference

hotel, is scheduled to open Thursday Feb 8, 2001. A new 750 room hotel, the Grand Californian, and an exciting retail strip alongside it are part of this brand new \$1.4 billion expansion. "Downtown Disney," located on the hotel grounds, will contain a 12 theater complex, ESPN Zone with sports-themed dining and entertainment, a House of Blues, Hoypoli art gallery, and a variety of exceptional cafes and restaurants.



With our ongoing Mission to serve the educational needs of practicing profession-

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President's Column *from page 1*

Technical Committees

In 2001, we will be testing some major structural changes to the Society technical operation. At present, there are six Technical Committees or groups within PELS. These groups are strong and well organized. Some are involved in a wide range of standards activities. Others organize topical workshops. However, just six groups are not nearly enough to cover the breadth of member interest. For instance, we do not have current technical committees on inverters or on dc-dc converters, and have not been leaders in setting standards for most power conversion equipment.

During 2001, we hope to initiate a flexible new committee structure that is tied to our conference activities. Many of our most active topical areas could benefit from a technical committee to help organize conference sessions, manage paper reviews, consider possible workshops, and examine the needs for standards. Some of the topic areas that are generating strong interest this year include dc power supply systems, motor drives and motion control systems, and rectifier/inverter systems. It is important that the topics and structure be flexible, so new technical committees can come and go to address current areas of need. If you would be interested in being a member of new technical committees in any of these areas, please send a note to Bob Myers (bob.myers@ieee.org). Our existing technical committees – on Electronic Transformers, on Computers and Control in Power Electronics, on Transportation Applications, on Packaging, on Education, and on Telecommunications Power – also have opportunities for new volunteers.

News from TAB

PELS is one of thirty-six technical societies within the IEEE. All are part of the Technical Activities Board (TAB) part of the IEEE. PELS is a medium-sized group, ranking fifteen out of the thirty-six. You might be interested that PELS is one of the fastest growing technical groups in IEEE, ranking just behind several societies engaged in wireless and optical communication and ahead of computers. This reflects the pervasive impact of power electronics today. The groups within TAB generate most major IEEE activities, such as conferences and technical publications. In fact, TAB is one of the largest scientific publishers in the world, and generates the majority of all international electrical and computer engineering technical literature. IEEE is highly respected for peer-reviewed high-quality publications. All scientific publishers face an uncertain future as the impact of electronic publishing and web-based information access continues to grow. IEEE, through TAB, is a leader in electronic publishing. If you can, please try out the new IEEE Xplore web interface. It is an outstanding tool for literature access. Our Society is part of a current strategic planning process within TAB. Discussion issues include the impact of electronic publishing, innovative member services, and more effective ways to organize both new and existing technical topic areas. The Power Electronics Society is committed to innovative services and more valuable publications.

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PESC 2000 Recap

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shop. The response to the invitation was overwhelming and Tony Ryan, our very patient teacher, succeeded in whetting the guests' appetites for more of the same on Tuesday and Wednesday morning. Some guests become so proficient that they performed an Irish dance at the Conference Banquet on Wednesday night! They even persuaded many conference delegates to try some Irish dancing for themselves.

Throughout the week a guest lounge was available to renew old acquaintances and make new friends. Guests enjoyed the 'Riverdance' and other Irish dance videos – there was also a chance to practice some Irish dance steps from the videos! There was a marvelous uptake on all the tours organized with great reports of enjoyable day trips to the Burren, Aran Islands, Connemara, and the Cliffs of Moher. Many guests spoke of their enjoyable few days at the conference and hoped to return to Ireland sometime soon. We look forward to seeing them again and extending a C ad M ile F ailte once more.

The awards lunch was held on Friday and was the last event of PESC '00. The awards lunch and winners were described in detail in the July issue of the Newsletter. Congratulations to all the winners! Bill Dunford, PESC '01 General Chair, concluded the awards lunch with a presentation of the PESC '01 site in Vancouver, British Columbia.

Ger Hurley

General Chair, PESC '00



Top – Founding Newsletter editor Harry and Phyllis Owen celebrated their 58th wedding anniversary at the PESC banquet; Bottom – PELS President Phil and Sheila Krein relax after dinner.

Tricks of the Trade: Simple Calorimetry for Accurate Loss Measurement[®]

Contributed by Dean Patterson
 Director, Northern Territory Centre for
 Energy Research
 Associate Dean, Research and
 Postgraduate Studies Faculty of
 Technology
 Northern Territory University
 Darwin, Australia

One of the things I like about power electronics is the way we can transform energy with such high efficiency. I think it's a very strong selling point for our discipline in the global push to use energy more efficiently. The greenhouse gas rewards are significant – but off the soap box, and on to the trick.



I well remember at PESC '90 an eager young researcher presenting a paper on a converter and proudly announcing that it had an efficiency of 98.5%. Dick Hoft from the back of the room asked "How did you measure that?" Now there's a question! Measure the power in; measure the power out? The higher the efficiency, the less accurate is this method (recall the pitfalls of subtracting two nearly equal numbers). With a dc-dc converter you have some chance using very expensive digital instruments (dc amps and volts in, dc amps and volts out), but most digital instruments misbehave a little when near switch-mode power supplies. I have seen power "materialize" many times. And then what about a three-phase motor controller? No instrument known to man can accurately record the hard switched output voltage waveforms when dv/dt is very high.

Measuring the losses as heat via calorimetry will do it. The problem is that the experimental physicists make it all so complicated, requiring water pumping, measuring flow rates and temperatures, equalizing all the temperatures, double-walled enclosures etc. I believed them for years, thinking it was just too hard, but for much of the equipment we build, it isn't. You can get very good, accurate answers for an equipment cost of about \$20. It takes a bit of time, but it works. An early version was described at PESC'95 [1], and we have managed to make it more routine since then.

The first thing you do is go to Kmart and buy what we in Australia call an "Esky" (I think it is called a "beer cooler" in the USA). Cheap large ones (26 litres), as shown in the photo, are about \$AUD 6.

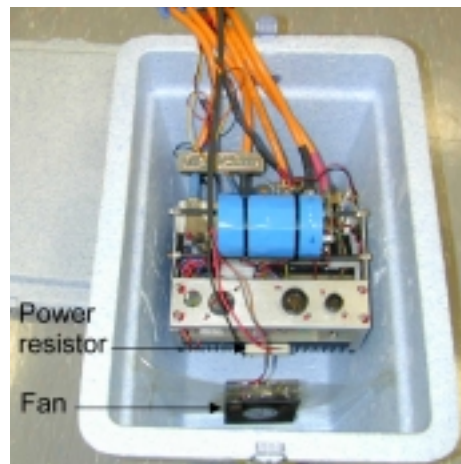
You need three or four solid-state temperature sensors. Accuracy is not a concern, but the resolution needs to be to around 0.1 Celsius. We use the LM35 DZ, \$AUD 2.50 each, with handheld voltmeters.

You then have to find a faulty computer power supply with a working "muffin" fan, and get the fan out.

The last thing you need to buy or salvage is a power resistor, e.g. 5 ohms, about 10 watt rating. Glue this to the heat sink of the controller/converter, as shown in the photo.

You will need a lab power supply capable of delivering to that resistor a bit more dc power than what you estimate the losses to be. You also need a couple of good handheld digital instruments, to measure amps and volts accurately for computing the injected power.

You need to find a place where the temperature is nice and steady, and doesn't change rapidly. An air-conditioned building is ideal, but anywhere you would brew beer would probably be okay. Stability of the ambient temperature for about 5 hours is important.



Put the controller-converter inside the esky, with the input source connected, and the output connections all complete. The photo shows a motor controller. Two heavy cables come from a dc power supply, and three go out to the 3-phase motor.

You need to put the fan inside the enclosure so it can stir the air evenly. The aim is that the internal temperature will be very even and without hot spots, so that the inside surface of the Esky and all the components inside are pretty close to the same temperature. You can be creative with baffles in the enclosure made from cardboard or sheet Mylar (the photo shows a sheet Mylar baffle). Put one temperature

sensor on the heat sink, a couple elsewhere in the enclosure, and one outside. If they are accurate then you will know if you have an even temperature inside. If not, you will at least get some clues. If you are concerned you might even calibrate the sensors; after some hours inside the enclosure with nothing going in, they should all be at the same temperature.

Put the lid on and tape it up to make a reasonable seal to prevent airflow in and out.

System Calibration.

Turn on the fan, inject a measured amount of power into the heat sink with your power resistor, and watch all the temperature sensors. When they stabilize, write down the average of the internal ones, minus the outside ambient reading, and the number of watts injected into the power resistor. Our "enclosure-controller couple" took about 4 hours to stabilize. If we get it right it's a first-order system with a classical exponential response. There is a "point" source of heat (actually a volume all at the one temperature), with heat flowing through a single thermal resistance (the polystyrene foam wall of the Esky), to a lower "point" sink at ambient temperature.

Try a few different values of steady power, and plot temperature differential versus injected power. You should get a straight line graph.

The beauty of this calibration process is that it covers the heat from the fan (1-2 watts when run on 9 volts), the inaccuracies in the temp sensors, the heat leaking out of the enclosure through the cable, bad seals, and just about everything else. The fan will, for example, cause an offset in the straight line calibration graph.

The Measurement

Don't touch the enclosure!

Turn off the power to the power resistor, leave the fan running, turn on the dc power into your converter/controller, and load up the motor (or the converter) to rated power, 1 kW in our case. Give it a few hours, read the temperature sensors, go back to your calibration graph, and read out the loss. Hence the efficiency!

We believe that our best controller (shown in the photo) dissipates 9.6 watts with 1000 watts of dc power in. That computes to an efficiency of 99.04%. Yes I know the $R_{ds,on}$ of the FETs changes with temperature, but since you know the temperature inside the enclosure, you can calculate that

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ANNOUNCEMENT WPET 2000

The 6th Biennial

Workshop On Power Electronics in Transportation

42V Power Systems for the Next 100 Years

December 5 – 6, 2000

Hilton Novi

Novi, Michigan USA

NOTE NEW DATE AND LOCATION

WPET 2000 will address the 42 V systems that are being pursued from industry consortiums, standards organizations, individual suppliers, and vehicle manufacturers. The need for a higher voltage system has gained prominence during the last decade and certainly will be implemented in vehicles during this decade.

This workshop will have sessions that focus on 42V Infrastructure Issues and Architecture, Energy Management/Conversion, Semiconductors and Packaging, and 42V Subsystems with papers covering such topics as 42V to 14V Converter, Integrated Starter Generator System, Load Dump Protection in 42V Systems, and Lithium Polymer batteries.

Keynote Luncheon Speaker (December 5): Dr. David Cole, Director of the Office for the Study of Automotive (OSAT) of the University of Michigan's Transportation Research Institute that publishes the Delphi Forecast and Analysis of the North American Automotive Industry

Registration Fees:	Before November 15	After November 15
IEEE or SAE Members	\$225	\$275
Non-Members	\$250	\$300
Students/Retirees	\$50*	\$50*

*Does not include reception and presentation handout.

The registration fee includes reception on December 5, two lunches on December 5 & 6, and presentation handouts.

For information and registration assistance: contact Susan Guinn, University of Michigan-Dearborn, Engineering Professional Development, 2200 Engineering Complex, 4901 Evergreen Road, Dearborn, MI 48128-1491; TEL: +1 313 593 4000, FAX: +1 313 593 4070, Email: sguinn@umich.edu

WPET is sponsored by IEEE Power Electronics Society and IEEE Southeastern Michigan Section, in cooperation with the Society of Automotive Engineers, and the MIT/Industry Consortium on Advanced Automotive Electrical/Electronic Components and Systems

APEC 2001 Expands *from page 4*
als in the power electronics industry, the Program Committee has organized a dynamite program to provide practical information on the latest components and circuits, design-oriented analysis techniques, and current trends in the design of power electronic products and systems.

“Hats Off” to the 31 members of the Program and Conference Committees who gave up a weekend in the middle of the Olympics to help finalize the APEC 2001 Program! These volunteer reviewers—representing power supply manufacturers, component manufacturers, OEM users, consultants, and academics—came to the Disneyland Hotel in Anaheim CA from as far away as Denmark and Japan to participate Sunday, September 24, in this annual team effort.

Our mission was to assist Conference Chair Mark Nelms with the annual challenge of organizing the conference program. Starting at 8:30 AM this dedicated group rolled up their sleeves and created the magic for APEC 2001. A Swiss watch never ran as smoothly as this APEC team. Comprised of everyone from elder statesman to first-time participants, this is not a closed club; we gladly invite anyone with technical or business-related skills in applied power electronics to become part of the Program Committee “family.” For an inside look at the program selection process, see the related article in this newsletter.

According to Joseph Thottuvellil, Program Chair, a record number (435) of digests were received from 34 different nations. Each digest was reviewed by at least

4 reviewers. Prior to the “final cut” meeting, 204 industry and academia experts had each volunteered to assist the Program Chair by reviewing and grading between 5 and 20 digests. A total of 1928 reviews were graded by this committee.

Responding to the challenge of including more highly-scored technical digests, the Program Committee agreed to reduce the Plenary Session to three presentations. This enabled us to add five, 4-paper sessions immediately following the Plenary Session on Monday afternoon, thereby expanding the technical program from 181 to an all time high of 198 papers. These 198 technical papers will be presented in 31 Sessions using 5 parallel tracks at APEC 2001.

The two largest topic categories of di-

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Book Review

Out-of-Print Books About Magnetics

Rudy Severns, Guest Reviewer

Magnetic components are present in almost all power electronic equipment, and their design is a permanent topic of interest. Many books have been written on magnetics design but unfortunately most of these books are out of print. However, many are available in technical libraries and used bookstores. Some of these are well worth the trouble to locate. This review departs from the normal practice of reviewing a single in-print book to identify a number of important and potentially useful out-of-print texts.



Magnetic Circuits and Transformers

MIT Technical Staff

John Wiley & Sons 1943, 5th printing 1947

This is a classic text used by generations of engineering students at MIT. While not a design manual per se it provides a very broad introduction to magnetic components and magnetic circuit concepts. At the time the book was written the primary application for magnetic components was utility power distribution and much of the material in the book relates to this application. However, much of the book is introductory in nature and still very relevant to modern converter magnetics. As with many of these older books, this one was written at a time when many different systems of units were still in use—unlike today where cgs and SI are standard. The reader does have to make some conversions from units that are not common today. This text is widely available in used bookstores.

Electronic Transformers and Circuits

Reuben Lee, Leo Wilson and Charles Carter
Wiley-Interscience, 1st ed 1947, 3rd ed 1988

This was one of the first texts to specifically address design of magnetic components for electronic devices as apposed to utility power distribution and it reflects the great strides made during WWII in electronic circuits including radar and video applications. It treats such subjects as transformers and inductors for rectifiers, pulse and video transformers, transformers with square and sawtooth waveforms, RF transformers and high frequency (compared to 60 Hz) applications. The 3rd edition picks up inverter and converter magnetics and is

very relevant to present day design.

Soft Ferrites – Properties and Applications

E.C. Snelling

Butterworths Ltd., 1st ed 1969, 2nd ed 1988

This book has a broad discussion of magnetics design and is very useful for present day applications. As the title indicates it focuses on magnetic devices using ferrite core materials; however, it has a great deal of basic information that is applicable to devices using any core material. The discussion on heat transfer and HF properties of windings is particularly useful because these subjects generally have received little attention in most texts. A similar book by Snelling and Giles (Ferrites for Inductors and Transformers) was published in 1983. It appears to contain some of the material in Snelling's first edition and was perhaps a short-term measure between editions of the more general book. It would be useful if a copy of the larger book cannot be found.

Transformers for Electronic Circuits

Nathan R. Grossner

McGraw-Hill, 2nd edition 1983

Grossner's book is one of the best magnetics design books I have seen. The writing is straightforward and practical but with enough theory to make it much more than a cookbook. It contains introductory material but then goes on to more advanced subjects such as high voltage and corona effects, thermal design, converter transformers, pulse transformers and insulating systems. This is a "must-have" book for power electronics designers!

Electromagnetic Devices

Henry C. Roters

John Wiley & sons, 1st edition 1941

I first encountered this book in a magnetics course at UCLA in 1962 and have kept it on my bookshelf ever since. It is one of the few books to treat in detail the design of electro-mechanical devices such as relays and actuators. Many such devices are still in common use today but very little has been written on their design. Although the book is primarily concerned with electro-mechanical devices, I have found the discussion in chapters 4 and 5 on the calculation of permeance of arbitrary air gap structures and leakage fields to be very helpful for modeling and designing static devices.

Applications of Magnetism

J. K. Watson

Wiley-Interscience, 1980

This is a general book on both soft and hard magnetic materials and their applications. It provides a very good general intro-

duction to static magnetic devices of many different kinds. It is one of the few books with a discussion of reluctance modeling of magnetic devices. Although out of print, a few remaining copies are available at www.ejbloom.com

There are many other good books which didn't make the list for this review. If you are interested in a more extensive list, let me know and I will email one to you.

Rudy Severns

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rudys@ordata.com

Rudy Severns is a retired engineer with over 40 years experience in power electronics.

Editor's note: Believing there is value from personal referrals in selecting great books from among the good, we have launched 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.

Tricks of the Trade

from page 5

effect and allow for it if you are really fussy.

Of course getting the right enclosure and the right thermal time constants for each job is important, and may take a bit of trial and error, or idle calculation on the back of an envelope (the thermal conductivity of styrofoam is 0.029 W/m²•K). For instance we use a six-pack cooler for both an 18 W fluorescent inverter and a 100 W maximum-power-point tracker for a solar car. In each case the loss we expect is about one to two watts.

Well it does take a little time, particularly in the calibration, but then you've got quite a bit of beer to drink. If you are really in a hurry, after the calibration you know the constants of the first-order system and you can get quite good answers just from the initial rate of rise of temperature.

[1] D. J. Patterson, "An efficiency-optimised controller for a brushless dc machine, and loss measurement using a simple calorimetric technique," *IEEE Power Electronics Specialists Conf.*, 1995, pp. 22-27.

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.

Future Energy Challenge

The 2001 Future Energy Challenge accepted proposals from 14 university teams to participate in a low-cost inverter design competition. The specific objective of the Challenge is to reduce the manufacturing cost for a 10 kW inverter, intended for fuel cell energy conversion, to less than \$500. The participating teams not only need to have a solid technical plan to achieve the design goal, but also need to address strong involvement with the undergraduate education program. A website at <http://energy.ece.uiuc.edu/energychallenge> contains the latest information, including the list of participating teams, and is open to the public.

To initiate this challenge, the U.S. Department of Energy (DOE) has committed \$50,000 for the Grand Prize, and the Department of Defense has provided \$25,000

for category prizes. Co-sponsorship also comes from individual labs such as the DOE National Energy Technology Laboratory (NETL), which will host the inverter test at the end of the competition, and the Electric Power Research Institute (EPRI), which will sponsor the EPRI Power Electronics Applications Center to develop a portable load for testing. The IEEE Power Electronics Society, Industry Applications Society, and Industrial Electronics Society are all joining to serve as the competition organizers.

All participating teams whose proposals have been accepted have been invited to a Springboard Meeting held in Orlando, FL from November 11 to 13, 2000 in conjunction with the National Science Foundation (NSF) Workshop on Multimedia Delivery of Modern Power Electronics Curriculum. Faculty advisors are encouraged to register

for and participate in the NSF Workshop in addition to the Springboard Meeting. The Springboard Meeting will include presentations, panel discussions, and fuel cell demonstrations from manufacturers. Sessions will address the technology issues of the 2001 competition, reach consensus on rule requirements, and provide an open forum for participants.

An Organizing Committee consisting of academia, manufacturers, and R&D scientists and engineers has biweekly meetings to set up programs and resolve issues. All interested parties can contact Jason Lai (laijs@vt.edu) or Philip Krein (krein@ece.uiuc.edu) to volunteer to participate in the committee meetings or assist with the competition. The Organizing Committee will soon be discussing plans for a future international energy competition.

UPDATE

An NSF Workshop on MULTIMEDIA DELIVERY OF MODERN POWER ELECTRONICS CURRICULUM

<http://floridapec.engr.ucf.edu/>

November 11-13, 2000

Orlando, Florida

Workshop Description

The objective of this workshop is to assess current multimedia efforts and explore new means to develop multimedia-based instruction in the area of power electronics. The workshop will discuss various delivery technologies available and how to implement them into power electronics courses. The workshop will provide the opportunity to make use of the collective experiences of many experts in using web technology in education.

Specific topics of discussion:

1. *Multimedia enhancement tools for power electronics*
2. *Web-based delivery environments*
3. *Hardware and software laboratory support*
4. *Innovative industry-university partnerships in power electronics education*
5. *Multidisciplinary team projects in power electronics (addressed in the Future Energy Challenge Springboard)*

This workshop features thirteen formal presentations covering web-based learning and web-based courses for power electronics. The keynote speaker on Sunday evening is Prof. Timothy N. Trick, Director of the Anderson Laboratory for Global Education in Engineering at the University of Illinois.

Future Energy Challenge Springboard

In collaboration with the 2001 Future Energy Challenge (see related announcement above), the NSF Workshop will have additional sessions for schools whose proposals have been accepted.

Workshop Participation

For individuals interested in presenting or for additional workshop information, please contact:

Prof. Issa Batarseh, School of Electrical Engineering and Computer Science, PO Box 162993, University of Central Florida, Orlando, FL 32816 Tel. (407) 823-0185, Fax. (407) 823-6334 batarseh@mail.ucf.edu

Sponsor:	National Science Foundation (NSF)
Co-sponsors:	IEEE Power Electronics Society; Center for Power Electronics and Systems, Blacksburg, VA; University of Central Florida



INTELEC® 2000: A Rousing Success

Phoenix was hot September 10-14, when over 1650 participants converged from around the world to attend INTELEC 2000. The high-pressure weather system that kept Texas hot all summer decided to move to Phoenix that week, so attendees got to experience the desert southwestern United States at its hottest. I am happy to report that everyone seemed to adjust to the heat and, while the attire for the conference was casual, the sessions were anything but casual! The battery sessions and workshops were exciting and lively, as always.

In keeping with the theme of the conference, "Powering Network Convergence in the New Millennium," the conference opened with a stimulating plenary session with broad perspectives on where we are and where our future lies, in the power world. Nick Osifchin, of International Power Strategies, discussed the many changes in the telecommunications infrastructure, as well as in the industry as a whole, and challenged the audience to consider the opportunities for highly reliable ac power in the new communications grid, as well as for equipment leasing solutions. Anthony Triolo, of Lucent Technologies, highlighted the challenges of providing reliable powering solutions for rapidly growing, highly distributed

wireless networks in harsh environments. Bob Cullen, of Hollingsworth & Voss, then gave the audience a perspective on the question, "How long will this growth cycle last, and what does it mean to service providers and consumers?" His message was clear that growth will most likely continue for at least another four years, fueled by growing demands for access to information, by e-Commerce activities and by the emergence of new services and service providers fighting for that the next communications customer. Clearly, the future of telecommunications power is bright—and challenging.

Participants had the opportunity to attend 40 technical sessions, encompassing 130 papers, addressing topics from power system design, to application of power in broadband, to alternate power technologies, to battery technologies. The accompanying exhibition included over 80 companies, including full line power system manufacturers, battery companies and companies offering a variety of specialty products or services.

Mark Jacobs, Chairman of INTELEC 2000, noted that "over 1650 participants came to Phoenix from 45 countries across all continents, except Antarctica." It was a truly international conference, drawing not

only power designers, but also those who select, plan for, and deploy power systems in their communications networks. Jacobs also stated that "this conference is the one place where attendees have an opportunity to bring together and analyze all the elements of power systems against the expectations of the ever-changing and evolving wireless/broadband/voice/internet communications network."

INTELEC 2000 Management Committee honored Joe Suozzi for his lifetime contribution to INTELEC and to the power industry. Suozzi was a founding member of INTELEC, and has been an active participant and supporter throughout the last 22 years. He also chose to receive his IEEE Third Millennium medal at the opening ceremonies of INTELEC 2000.

In summary, INTELEC 2000 was a great success, setting new records for attendance, papers given and exhibits. Now is the time to start practicing that golf swing, since INTELEC 2001 will take place in Edinburgh Scotland, October 14-18, 2001. Check the INTELEC website at www.intelec.org for information about our conferences.

*Sharon Sugarek
INTELEC 2000 Publicity Chair
Lucent Technologies*

Did You Miss IWIPP?

If you were snoozing, you just missed the second International Workshop on Integrated Packaging. The Friday/Saturday event held July 14 and 15, in Waltham, Massachusetts, brought together many impressive members of the power electronics packaging community with equally impressive information. Twenty papers were presented to 46 attendees representing 11 countries.

The Workshop was launched Friday morning with 19 participants in a 2-part short course on "Power Electronics Packaging - A Systems Perspective." The course was presented by the Workshop Chairman, Dr. Doug Hopkins, State University of New York at Buffalo, and past Chairman, Dr. Krishna Shenai, University of Illinois at Chicago. They covered the latest in packaging technologies for packaging levels 1 through 3. Dr. Shenai presented recent results in modeling that show how internal charge flows in IGBTs and MOSFETs change due to packaging parameters.

The Friday afternoon session chaired by the workshop's Technical Chairman, Dr. Guo-Quan Lu, offered four papers that sum-

marized the breadth of the power-packaging field. The first paper reviewed results of the PSMA report on the "Status of Power Electronics Packaging" for power supplies (see www.PSMA.Com for information about the report). This was followed by a description for an advanced packaging approach developed at the GE Center for Research and Development. The approach eliminates wire bonds to produce an ultra-low inductance package. Dr. Venkataramanan from the University of Wisconsin provided a high level view of using "bricks and buses" to modularize power. The last paper presented by Dr. Shenai gave the state-of-the-art in SiC devices by describing the characteristics of a 100V, 1A PIN diode and a 50V, 0.5A JFET as benchmarked in a dc-dc converter.

Friday evening was filled with a Banquet and Rap session. Mr. Terry Ericson from the Office of Naval Research presented the banquet address on the US Government's needs in future power electronic systems and described some of the programs underway specific to the Navy. This led directly into the Rap session chaired by Dr. Fred Barlow. The discussion was brisk and covered sev-

eral topics. The most notable was the impact of recent energy deregulation in the US and the sharply urgent elevation of 'energy production, conditioning, and management' as a primary focus in the world. Considerable discussion ensued on the effect on power electronics technology including packaging.

Saturday came with a full day of 16 papers. The day was divided between materials, packaging techniques, and applications. A summary of paper titles and abstracts can still be viewed at www.IEEE.Org/conferences/IWIPP. An informative luncheon featured Mr. Mike Shaw, who presented a review of the technology developments at Rockwell Science Center. The advancements in high temperature electronics is being pushed by advances in SiC devices which continue to show great promise. The audience was provided many interesting details that will shape much of the future in power electronics packaging. For a copy of the Workshop proceedings contact the IEEE at www.ieee.org or by calling 800-678-IEEE, and ask for proceedings 00EX426.

*Doug Hopkins
Workshop General Chair*

PRODEVCON Offers Professional Development Tips

What used to be called the "PACE" Conference is now called PRODEVCON, which stands for Professional Development Conference. As PELS PACE Chair, I attended PRODEVCON in Scottsdale, AZ Sept. 1 through Sept. 4. The emphasis in this conference is on development of the professional, non-technical (also referred to as 'soft') skills of the attendees. The conference was divided into tracks, meaning there were several simultaneous presentations at any given time. The choice of which presentation to attend was left to the attendee. There were tracks on:

1. Women in engineering
2. Engineering management
3. Skills for more effective engineers
4. Career development strategies
5. Skills of GOLD (Graduates of the last decade)
6. Leadership training
7. Staying competitive

A copy of the Conference proceedings was given to all of the 200 registered attendees. It consisted of a 280-page, hard-bound book of all the papers, and the resume of every presenter. Some of the presentations that most interested me were:

1. Career Planning: Balance Between Work & Personal
2. Technical Consulting for a Living

3. Attitudes Toward Employability of Older Workers

4. Effective Communication using New Internet Technologies

The first described activities by which the fully-committed engineering professional can still keep a satisfactory life outside of his/her career. The second described the responsibilities of a self-employed consultant and the steps to begin a consulting business. The third described a funded study both of employed IEEE engineers and of human resources or management personnel. It explored the attitudes of employees and employers toward the aging professional. The fourth listed a variety of internet services and described how each could be exploited to optimize the productivity of the engineers.

One of the Conference speakers was Al MacRae <a.macrae@ieee.org>, Chair of the Professional Development Activities Committee (PDAC). His function is as coordinator of all Society PACE activities; he oversees all PELS PACE activities. He listed several PACE activities that can be coupled with Technical Conferences:

1. Table of literature about professional activities
2. Luncheon speakers about profes-

Continued on page 15

NORPIE 2000

A Success in Denmark

On June 13-16 Aalborg University, Institute of Energy Technology, hosted a medium-size conference in power electronics called NORPIE/2000 (IEEE 2000 Nordic Workshop on Power and Industrial Electronics). Last time (1998) it was held in Finland. Once again the IEEE Power Electronics Society was a technical co-sponsor. NORPIE/2000 was a truly international activity since more than 85% of the papers were from outside Denmark. In total 111 persons participated from 13 countries and more than 30% from industry. In total 57 papers from 13 countries were presented in the first two days with many interesting and up-to-date subjects such as wind turbines, power semiconductor devices, power converters, power supplies, drives, electric machines, diagnosis, and EMC-problems. Two keynote speakers introduced the sessions. The first day Prof. D. van Wyk from Center of Power Electronic Systems (CPES), USA spoke about new technologies for power electronics and their applications. The second day Prof. M.P. Kazmierkowski from the Technical University of Warsaw, Poland discussed new control strategies for advanced motor controllers. The conference had a very high technical quality.

Continued on page 11

APEC® 2001 Expands *from page 6*

gests received were in the areas of AC and DC Motor Drives, followed by single- and three-phase PFC. Fifty percent (50%) of the accepted digests were from authors representing 27 foreign nations led by Korea, Spain, Japan, Brazil and China. Inclusion of this large number of international papers is a reaffirmation that APEC continues to maintain its worldwide recognition as the foremost conference for presenting technical papers addressing all aspects of "applied" power electronics. Although a large number of digests were received from Asian Nations, we also received and accepted papers from as far away as Australia and India. Representing almost 20% of the accepted technical session papers, authors from China, Japan and Korea continues to demonstrate that Asian industry and academia are very active in practical technology advancements as we move into the challenges of the 21st century.

Seminar Chairman Jeff Fishbein provided an overview of the 29 proposals received for Professional Education Seminar

consideration. After reviewing the proposals, the committee agreed to offer five parallel tracks starting with two on power supply design, one on motor drive design, one on power packaging, and a fifth track to contain a modeling seminar with two Seminars on automotive electronics for a total of 15 Seminars being presented on Sunday and Monday.

Rap Session Chair Russ Spyker provided a summary of seven suggested controversial topics for this year's program. Russ will now finalize on the moderator and panelists for three of those topics per direction of the committee.

The sold-out exhibit hall will contain the latest product offerings from power electronic components to power supplies and DC/DC converters. APEC 2001 will contain 148 booths, representing another conference record. Exhibits Chair John Basset will have a drawing for all attendees in the exhibit hall on Tuesday where the first prize will be a notebook computer. The second prize to be awarded will be a DVD player and the final prize will be a Palm Pilot.

Winners must be present when the drawing is held.

To summarize, APEC 2001 will offer 31 Technical Sessions, 15 outstanding Professional Education Seminars, 3 RAP Sessions, up to 12 free Vendor Application Seminars, a sold out Exhibit Hall, the Micro Mouse competition, and finally, an opportunity to mingle with distinguished industry and academia experts.

Please mark your calendars to attend the APEC Conference, where you'll surely get more "bang for the buck" than at any other "applied" power electronics conference.

We will also provide a spousal hospitality program in conjunction with the Conference, so bring your spouse and credit cards.

As final details are confirmed I will provide an APEC 2001 update in future reports. For additional conference or exhibition information, please click on our web site at www.apec-conf.org or call +1 202 973 8664. See you in Anaheim.

Larry Gilbert
APEC'01 Publicity/
Local Arrangements Chair

Insider Report: How the APEC® Technical Program is Selected

The unsung heroes of the APEC conference and exposition are the numerous volunteers who provide the fuel to keep the APEC engine running smoothly. The organization and planning for APEC 2001 actually began prior to the conclusion of APEC 2000 in New Orleans. Administration of each year's APEC is conducted by a Conference Committee whose volunteer members participate in monthly conference calls discussing their areas of responsibility and reviewing status reports. This report will provide an overview of one of the most critical elements of APEC—the Technical Program.

The Program Committee, led by the Program Chair, is responsible for developing the technical program. The Program Chair oversees the Program Committee, recruits digest reviewers, manages distribution of digests to reviewers, collects and tabulates reviewers scores, presides at the Program Committee meeting, and chairs the Plenary Session of the conference. The Program Chair is at the second step of a three-step sequence that goes from Assistant Program Chair to Program Chair to Conference Chair.

One of the first tasks of the Program Chair is to create the "call for papers" for the following APEC that is found in the conference proceedings. The call for papers is supported by paid ads which appear in spring issues of major trade publications and conference sponsor newsletters, providing adequate time for perspective authors to draft and submit proposed technical and business digests.

In anticipation of receiving these digests the Program Chair mails out invitations to industry and academia experts inviting them to participate in the peer review process. All reviewers become members of the Program

Committee and their efforts and contributions are acknowledged in the Conference proceedings. The topic list for APEC contains over 50 possible areas where reviewers can indicate their knowledge if called upon to review digests reflecting those topics.

As digests are received the Program Chair uses his best judgment in assigning them to the reviewers most qualified to grade them. To avoid favoritism none of the authors' names appear on the digests being reviewed; digests are identified by numbers assigned as they are received. Each digest is reviewed by at least 4 reviewers.

Once all digests have been graded and entered into a database, the Program Chair creates three categories to assist in making the first cut. We strongly enforce our standing policy to reject all digests which are principally advertisements for a particular product or service. Those with scores in the top 25th percentile are automatically accepted. On the other end of the spectrum, those in the lowest 25th percentile are automatically rejected. Some of those authors are encouraged to submit their papers to PESC rather than APEC if they fail to satisfy the "applied" aspect of the conference. The remaining 50% are reevaluated by those members in attendance at the Program Committee meeting which is typically held on a weekend at the end of September at the conference hotel for that program.

Each reviewer is invited to participate in the Program Committee meeting and help organize the conference. At the Program Committee meeting, members break into small, topic-specific groups to reconsider digests in the middle 50% which the Program Chair brings to the meeting. Once that has been completed the accepted papers are organized into a logical sequence of techni-

cal sessions. The Program Chair oversees the task of creating a matrix with five parallel tracks in which we attempt to avoid having conflicting, parallel sessions. Each group chooses a leader who suggests titles for their session proposals and identifies any outstanding digests in their session that should be considered for the Plenary Session. Before the meeting is adjourned the Program Committee selects Session Chairs whose responsibility includes contacting the authors of their sessions to make sure that they have their completed documents submitted to the printer in accordance with published deadlines.

To illustrate the magnitude of the task using some recent numbers from APEC 2001, 435 digests were received by the cut-off date in early September. Each of the 204 reviewers was asked to read and score from 5 to 20 digests, devoting 10 to 20 minutes to each digest. A total of 1928 reviews were graded by the Program Committee, and 198 papers were accepted for presentation in 31 sessions using 5 parallel tracks. Without the aide of database software, processing over 1900 digest reviews would surely be a monumental task.

After the Program Committee meeting concludes, the Program Chair sends out letters of acceptance/rejection to every author. As the deadline for final papers approaches, he or she also contacts all Session Chairs to have them pursue any authors late with their submissions.

In the world of power conversion, manufacturers brag about the efficiency of their products. I would argue that the efficiency of the Program Committee, under the leadership of the Program Chair, deserves similar recognition.

Larry Gilbert
APEC Publicity Chair

NORPIE 2000

from page 10

The conference was introduced on June 13 with two tutorials. The first tutorial discussed silicon material, its manufacturing and use. The Danish company TOPSIL provided that tutorial. The second tutorial treated rectifier-topologies for power supplies which fulfil new standards. Prof. J. Kolar, Technical University of Vienna, provided this tutorial.

On the last day, June 16, all participants were invited on an industrial tour to visit Bang & Olufsen. The power electronics group at Bang & Olufsen showed the newest development in their TV and audio prod-

ucts. Their products are very high-tech and high performance.

Two social arrangements were also included in the program. On June 14 the Mayor of Aalborg hosted a very nice reception in the old town hall in the center of Aalborg followed by a refreshment in the famous Duus Vinkaelder. A very nice dinner was served on June 15, also downtown, which finalized the conference activities.

NORPIE/2000 received a number of sponsorships from the Danish Industry because Danfoss Drives A/S, Grundfos A/S, Vestas Wind Systems A/S, Migatron A/S, Cooper Bussmann Inc, and APC-Denmark

have supported the conference. These sponsorships resulted in a low registration fee of this high level conference. A CD-ROM of the workshop proceedings can be requested by contacting professor Frede Blaabjerg (+45 9635 9254, fbl@iet.auc.dk) or Birthe Johansen (+45 9635 9245, bj@iet.auc.dk). The content can be seen on <http://www.iet.auc.dk/norpie2000>.

NORPIE/2002 will be held in Stockholm, Sweden, with Prof. Hans Peter Nee as the Conference Chair.

Frede Blaabjerg
Chairman - NORPIE/2000
Aalborg University

Nominations Sought *from page 1*
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 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 of more than two 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 the 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, 2001. 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 an inscribed plaque, 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 the 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 encour-

aged, to nominate candidates for these awards. You may use the forms on pages 12 and 13 of this newsletter, attaching a separate sheet summarizing the nominee's qualifications and achievements. 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 2000. A Best Chapter Award, inaugurated in 2000, will be presented to a PELS chapter. For further information regarding the latter award, see the form on page 14 of this newsletter or contact Jaime Arau at j.arau@ieee.org.

*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
E-mail: 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 2001

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 2001.

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.

IEEE POWER ELECTRONICS SOCIETY

NOMINATION FORM

Distinguished Service Award

Award Year 2001

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 2001.

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.

IEEE POWER ELECTRONICS SOCIETY

NOMINATION FORM

Richard M. Bass Outstanding Young Power Electronics Engineer Award

Award Year 2001

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 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 2001.



IEEE POWER ELECTRONICS SOCIETY
Best Chapter Award Form



Section / Council Affiliation _____

Chapter Chairman _____

Please complete the following information about your chapter, which will be evaluated by the Best Chapter Award Evaluation Committee.

1) Number of: Regular members _____ Student members _____

2) Do you have a Web site? YES () Address: _____ NO ()

TECHNICAL ACTIVITIES:

3) Local & Regional Lectures (Please attach a list of the lecturers and speakers and any additional information.)

4) Conferences & Seminars organized (Please attach all related information.)

5) Use of the Distinguished Lecturer Program (Please attach all the important information about the lecturers invited and the results of the events.)

6) Plan of activities (Describe the plan of activities for the following year.)

7) Other related activities (Describe any other technical activity related to the promotion of Power Electronics in the chapter's zone of influence.)

Date: _____ Chair's Signature _____

INSTRUCTIONS: Complete this application form adding up to three additional pages if necessary to answer the questions completely and send it to Jaime Arau (PELS Chapters Development Chair) by email (j.arau@ieee.org), by fax (+52 73 12-23-14) or by regular mail to Interior Internado Palmira s/n, Col. Palmira, Cuernavaca 62490, Mor., Mexico, before March 1.

TELESCON® 2000 in Dresden

The third TELESCON - "International Telecommunications Energy Special Conference" as a Satellite Conference to IEEE PELS INTELEC® took place in Dresden, a German city often referred to as "Florence on the Elbe." As with the two previous TELESCON conferences in Berlin and Budapest, the motto was "East and West Grow Together." The aim of TELESCON is to discuss important topics such as the future of power supplies and energy conservation within the field of telecommunications, and to integrate power experts of the eastern countries into the world of INTELEC.

Under the patronage of Kajo Schommer, Saxony State Minister for Economic Affairs and Labor, and the General Chairman of the conference Joachim Claus, head of Innovation Management at the headquarters of Deutsche Telekom AG, the three-day conference was attended by 240 experts from 34 countries. Thanks to the generous sponsoring by firms and organizations, specialists and students from the eastern part of Europe were invited to attend the conference and/or to present their papers.

The program was an excellent blend of presentation, application and discussions on energy technologies that offer new insights into powering today's rapidly changing communications and data network. The plenary sessions included well-known names from Europe, North America, Japan, and the Central European region.

The program offered 62 papers from authors of 18 different countries, a workshop "Powering the Internet - 48 V," and a student-poster-presentation technical competition. The finest presentation of 11 poster papers was given by three students from the University of Zilina in Slovakia and received an award of a free trip to INTELEC 2000 in Phoenix, Arizona, USA. Subsequent to the award in Dresden, Mark Jacobs, the General Chairman of INTELEC 2000, also waived the registration fee for the three students.

As is the tradition for all INTELEC conferences, the TELESCON conference started with the opening of the exhibition consisting of 19 exhibitors from 9 countries. The participants and their accompanying spouses enjoyed the social programs highlighted by a boat trip on the river Elbe with a dinner and a Dixieland band on board, and a banquet in the conference Hotel Westin Bellevue. The conference and Dresden's attractive surroundings and historic buildings and museums will provide fond memories for all participants.

TELESCON 2000 Dresden was organized by the Information Technology Society (ITG) of the VDE Association for Electrical, Electronic & Information Technologies in Germany. Program Chairman Wilfried Schulz from the Deutsche Telekom and his committee organized the scientific preparation of the conference.

The next TELESCON will take place in 2003 in Rio de Janeiro, Brazil.

Robert E. Jurewicz, Chair
INTELEC Executive Committee



Left To Right: Front; Heinz -A. Kiehne and Robert E. Jurewicz.
Rear; Christopher O. Riddleberger, Nick Osifchin, Joachim Claus, Kajo Schommer,
Joseph J. Suozzi, and Gunter W. A. Vau.

PELS Bylaws Amended

The Power Electronics Society has amended its Bylaws to designate all past Society presidents as ex-officio members of the AdCom without vote. The change was approved by a unanimous vote and "reviewed and found to be in good order" by the IEEE Technical Activities Board.

The amendment adds a sentence to Section 3.4 relating to past presidents. The section was adjusted to read in full (with additional language in italics):

"3.4 Past Presidents

The two most recent retiring Society Presidents shall be known as the Past Presidents and shall be ex-officio members of the AdCom with vote. *Other retiring Society Presidents shall be ex-officio members of the AdCom without vote.*"

The new section will become effective 30 days after the publication of this Newsletter. PELS members wishing to comment on the amendment are invited to contact PELS Administrator Bob Myers by e-mail at bob.myers@ieee.org.

Quicker News Delivery

Production and mail delays have been interfering with timely delivery of this newsletter. We are fortunate to have much more rapid web postings, however. If you would like to receive electronic mail notification when the newsletter becomes available on the Power Electronics Society server, go to <http://www.pels.org/Mailing/MailForm.html> and add your name to the notification service list.

PRODEVCON

from page 10

sional activities

3. Panel discussions about to role of the engineer in today's society
4. Mentoring for young engineers
5. PACE Reception
6. "Today's Engineer" display

Mr. MacRae also mentioned funding that is available to cover an activity. The IEEE staff coordinator for this is Sandra Kim <sandra.kim@ieee.org>. PELS members who wish to have an activity at a technical conference can contact Ms. Kim, Mr. MacRae or myself. I believe such an activity will enhance a technical conference.

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Meetings of Interest to PELS Members

IAS 2000, the 35th Annual Meeting of the IEEE Industry Applications Society, will be held in Rome, Italy, October 8-12, 2000. This world conference is organized by AEI and IEEE/IAS, and co-sponsored by IEE, IEEE/IAS, and IEEE/PELS, in cooperation with EPE. See <http://www.aei.it/ias2000.html> for details.

CIEP 2000, the 7th IEEE International Power Electronics Congress, will be held October 15-19, 2000 in Acapulco, Mexico. For additional information visit <http://www.cenidet.edu.mx/ciep2000/>.

An NSF Workshop on Multimedia Delivery of Modern Power Electronics Curriculum is planned for November 11-13, 2000 in Orlando, Florida, USA. PELS is a co-sponsor. See page 8 of this *Newsletter* for details.

POWERCON 2000 International Conference on Power System Technology, is set for December 4-7, 2000 in Perth, Western Australia. Organized by IEEE Power Engineering Society, Western Australia Chapter. See <http://www.ee.uwa.edu.au/~aips/powercon/> for further information.

ISIE 2000, the IEEE International Symposium on Industrial Electronics,

will take place December 4-8, 2000 in Puebla, Mexico. Visit the website at <http://www.udlap.mx/~centia/isie2000/> for further information.

WPET 2000, the 6th Workshop on Power Electronics in Transportation, takes place December 5-6 at the Hilton Novi in Novi, Michigan. Note the revised date and location. For further information, see page 6 of this *Newsletter*.

APEC® 2001, the 16th 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 Disneyland Hotel, Los Angeles, CA, USA, March 4-8, 2001. See www.apec-conf.org and the article on page 4 of this *Newsletter* for details.

E-TEM2 is scheduled March 14-16, 2001 in Liege, Belgium. Sponsored by the European Power Electronics Association, the conference theme is tomorrow's education in electrical engineering. The meeting format will focus on discussion. For further information contact the EPE Association by email E-TeM2@vub.ac.be or TEL +32 2 629 28 20.

PESC® 2001, the 32nd Annual IEEE Power Electronics Specialists Conference, will be held June 17-22 at the University of British Columbia in Vancouver, Canada. PESC is sponsored exclusively by the IEEE Power Electronics Society. See the article on page 1 of this *Newsletter* for additional information or check <http://www.conferences.ubc.ca/pesc2001>.

TENCON 2001, the IEEE Region 10 International Conference on Electrical & Electronic Technology, will be held August 19-22, 2001 on the SuperStar Virgo Cruise departing from Singapore. For details check <http://www.ieee.org.sg/tencon2001/>.

EPE 2001, the 9th European Power Electronics Conference, will be held at Grazer Congress Center in Graz, Austria on August 27-29, 2001. For complete information, see <http://epe2001.unileoben.ac.at>.

INTELEC® 2001, the 23rd International Telecommunications Energy Conference, is set for October 14-18, 2001 in Edinburgh, Scotland. Abstracts are due January 19, 2001. Visit <http://www.intelec.org> for additional information.

The INSTITUTE OF ELECTRICAL & ELECTRONICS ENGINEERS, Inc.

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