Initiation of Power Seminars

EPPEI has recently initiated a series of power seminars, coordinated by Dr. Ali Abur, for students and individuals in the electric power industry, four of which were given so far. Dr. Nuthalapati D.R. Sarma discussed Distribution Automation, Dr. Aydogan Ozdemir gave a presentation on Branch Outage Simulation for Contingency Studies, Slavko Vasilic gave a presentation on Neural-Fuzzy Pattern Recognition Algorithm for Classifying the Events in Power System Networks and Nirmal-Kumar Nair discussed Transaction based Voltage Security Margin Allocations for Deregulated Electric Markets. These power seminars will continue in the fall.

For more information on the 2002 Power Seminars, or to see the power point presentations, visit our website at http://eppe.tamu.edu/powseminar.shtml

Invited Lecturers

Dr. Prasad Enjeti hosted Dr. Bimal K. Bose, Professor for the Department of Electrical Engineering at The University of Tennessee, Knoxville. Bose discussed Neural Network Applications in Power Electronics and Drives and Power Electronics – its Progression and Impact on Energy and Environment.

Bose, a Life Fellow of the Institute of Electrical and Electronics Engineers, (IEEE) holds the Condra Chair of Excellence in Power Electronics (Endowed Chair) at the University of Tennessee, Knoxville. Bose has published more than 150 papers, authored/edited six books and holds 21 U.S. Patents.

Bose is a recipient of many awards and honors that include IEEE’s Millennium Medal, Continuing Education Award, Lamme Gold Medal, Industrial Electronics Society Eugene Mittelmann Award, Region 3 Outstanding Engineer Award, an Industry Applications Society Outstanding Achievement Award, and the Calcutta University Mouat Gold Medal.

EPPE Hosts NAPS Power Symposium

The Electric Power and Power Electronics Institute, along with the Department of Electrical Engineering, the Dwight Look College of Engineering, the Institute of Electrical and Electronics Engineers (IEEE) Power Engineering Society, TXU Business Services and the National Science Foundation, recently sponsored the 33rd Annual North American Power Symposium (NAPS) at the George Bush Conference Center at Texas A&M University.

Chaired by Dr. Karen Butler-Purry, associate professor and associate dean of engineering, NAPS is a symposium engineered to stimulate scholarly work in electrical power engineering and to provide a forum for university faculty, students and industrial representatives to discuss research ideas and to present the results of their research.

The two-day symposium included a plenary session featuring Mike McCall of TXU, Gregg Hollenberg of Reliant Energy Business Services, Tom Noel of ERCOT and Jayant Kumar of the ALSTOM, ESCA Corporation as speakers (top) where they discussed the Texas Retail Competition. This was followed by sessions with various topics from Power System Markets and Restructuring to Power System Analysis, Modeling and Simulation.

EPPEI Recognizes...

2002 Industry Partners

ABB
American Electric Power
Entergy Services
Oncor Electric Delivery Company
PaciﬁCorp
Reliant Energy HL&P

Each member category has distinct beneﬁts. For more details, visit us at http://eppe.tamu.edu/.

EPPEI Faculty

Dr. Ali Abur
Dr. Karen Butler-Purry
Dr. Mehrdad Ehsani
Dr. Prasad Enjeti

Dr. Garg Huang
Dr. Mladen Kezunovic
Dr. B. Don Russell
Dr. Chanan Singh
Dr. Hamid Toliyat

Awards and Honors

A number of EPPEI faculty members and students were the recipients of professional awards and honors in the past few months.

- Graduate student, Mr. Sasa Jakovljevic (2002) has received the 2nd best student poster award at 2002 IEEE PES Winter Meeting in New York. (Dr. M. Kezunovic, Advisor).
- Graduate student, Mr. Slavko Vasilic has received the 2nd best student paper award at 2001 IEEE T&D conference in Atlanta. (Dr. M. Kezunovic, Advisor).
- Dr. Singh was designated Regents Professor (2001)
- Dr. Enjeti received Outstanding Faculty Award (2001)
- Dr. Ehsani received the IEEE James R. Evans Avant Garde Award (2001)
- Dr. Butler-Purry was named Assistant Dean of Engineering (2001)
- Dr. Enjeti named University Faculty Fellow (2001)
- Texas A&M EE Team Won the $50,000 2001 Future Energy Challenge Award (Grand Prize) to design & develop an inverter for an environmentally friendly power source called a fuel cell. Drs. J. Howze and P. Enjeti were faculty advisors for the project.
From the Editor...

We have witnessed another outstanding year in EPPEI history. The students and faculty have received numerous recognitions, a new industry member (AEP) has joined the Institute, and provided a gift and research and academic activities continue with new initiatives such as the joint faculty projects, newly approved P'Serc projects and an invited lecture and power seminar series. We were in the spotlight for organizing the Northeast Power Symposium in November and Industry Advisory Board Meeting of P'Serc in December of 2001. We were pleased to recognize an outstanding retiree (Charles Fromen) and awarded numerous undergraduate scholarships and graduate fellowships. To top it all, our undergraduate enrollment has doubled with a record of over 200 students enrolled in ELEN 459, 460, 438 and 441 in the Spring and Fall of 2002. The support of our industry advisors, hard work of our faculty and dedication of our students made our 2001/2002 academic year a very productive one. Gig’em Aggies!

Mladen Kezunovic

Reliant Field Trip

On Friday, March 1, 2002, students from Texas A&M University’s Electrical Engineering 459 class and several graduate students toured Reliant Energy HL&P’s Tomball Substation.

After a brief welcome and safety review from Jerry Kubena and Floyd Griffith of Reliant Energy HL&P Substation Performance, the students were able to see first-hand three different control houses and corresponding switchyards.

The tour guides from Reliant Energy HL&P Substation Projects were Leticia Lifesy for the 12 kV distribution voltage, Alberto Benitez for the 35 kV distribution voltage and Don Sevcik for the 138 & 345 kV transmission voltages. The students were provided with basic one-line diagrams depicting the electrical arrangements of the substation and were also provided with a text description of the substation. High voltage equipment ratings, protective relay systems functions, remote control capability and high resolution disturbance monitoring were included in the tour.

Following the tour, Reliant Energy HL&P hosted a lunch and informal presentation at their Cypress Service Center. During lunch the students were able to interact one-on-one with the tour guides as well as Mary Buyalos, a Recruiter from the Reliant Energy College Relations group.

Faculty Research Feature

This and future issues will highlight joint research projects of EPPEI faculty aimed at solving multidisciplinary problems

Drs. Toliyat and Enjeti collaborated on a joint project to American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) entitled “Measurements of Electrical Power Inputs to Variable Speed Motors and their Solid State Power Converters”. The objective of this proposal was to develop instrument specifications that will be capable of accurately measuring voltage, current, power and energy of adjustable speed motor drives (ASD) systems.

Several instruments claimed by the manufacturers to be capable of monitoring these variables in modern ASD systems were thoroughly evaluated in the state of the art laboratory. The selected monitoring equipment was used to measure the current, voltage, power and energy of three different types of motor drives.

Pulse width modulated (PWM) inverter fed induction, brushless permanent magnet (BPM) and switched reluctance transducers (SRM) drives were used to assess the accuracy of the measurement equipment. The readings were compared with the lab’s state of the art computer controlled data acquisition system. Measurements were conducted on three ASD test stands. These measurements were performed under various loading conditions and speeds.

The effect of utility voltage distortions, unbalance, PWM switching frequency etc. on measurement accuracy was experimentally evaluated in the lab. The motor drive test beds are equipped with state of the art torque and speed transducers. In order to be able to estimate the distribution of the losses in the motor drive it was necessary to have a measurement of the shaft power, which was obtained using these transducers. The torque transducer has sufficient bandwidth and can provide an instantaneous analog signal, which its amplitude specifies the torque level, and its ripple determines the motor shaft torque pulsation.

Accurate measurement of current and voltage of ASDs requires current and voltage transducers with a relatively high bandwidth. The development and demonstration of the proposed ASHRAE standards was performed at the facilities of Texas A&M University. These include the Advanced Electric Machines & Power Electronics Laboratory and the Power Quality Lab, consisting of sophisticated state-of-the-art electrical and electronic equipment. The test-cell suites available in these laboratories are designed for speedy and inexpensive setup, and they are well suited for serious rotating machinery research. Additionally, the extensive high performance computer software and hardware capabilities available at Texas A&M were used for this project.

Lab Improvements

Hardware

Seven Dell OptiPlex GX240 (P4 1.5G/256M/20G) with Windows 2000.

Two Dell OptiPlex GX150 (P3 1.13G/512M/20G) with Windows NT4.

One Dell PowerEdge 2500 Server (P3 1G/512M ECC/2*36G) with Windows NT4.

Digital Simulator:

PC - Dell OptiPlex GX150 Communication board CYTEN I/O box TECHRON amplifier cabinet

Software

PSIM Version 5.0

PSCAD/EMTDC Version 3.08

PTI PSS/E Version 27

CAPE 2002 Version

Relay Assistant 2002 Version

EPPEI Graduate Student Travel Grants


Adediran, A., Haji, M. and Ahmed, S., received travel grants to travel to the 2001 IAS Meeting.

Yan, P. and Ou, Y., received travel grants to travel to the IEEE PES Summer Meeting, 2001.

Abolhassani, M., Hajaghahtani, M. and Xu, H., received travel grants to travel to the IEMDC 2001 Conference.
EPPE Group Participation in PSerc Activities

The Electric Power and Power Electronics (EPPE) group at Texas A&M University joined the PSerc consortium in the year 2000. The consortium brings together 13 universities and more than 35 industry members with a purpose of carrying out joint research efforts. Initially three EPPE faculty (Ali Abur, Garng Huang and Mladen Kezunovic) together with Costas Georgiades from the Telecommunications and Signal Processing group participated in five PSerc projects that were approved in 2000 and will end in 2002. Details of the project activities may be found at the PSerc web site at http://eppe.tamu.edu/pserc.shtml.

The EPPE involvement in research activities has been extended this year with an approval of seven new projects with participation of the mentioned TAMU faculty, with the addition of Chanan Singh. TAMU faculty also actively contributed to the discussion of the research roadmap at the PSerc retreat in August, 2001. With the sponsorship of TXU Electric, TAMU hosted the Industry Advisory Board meeting of PSerc in December, 2001. At that meeting TAMU also helped organize a panel session titled “IT in Power Systems.” Kezunovic represents the EPPE group in PSerc as the site director for TAMU. He also chairs the T&D Technology Research Stem Committee, one of the three such committees charged with coordinating research efforts in the three PSerc research areas of interest. For more information, visit the PSerc web site at http://www.pserc.wisc.edu/.

EPPEI Gift Recognition

Mr. Jeff Gerken, representative of AEP receives a recognition plaque from Dr. Mladen Kezunovic for AEP’s gift to EPPEI

American Electric Power Co. (AEP), a leader in the utility industry, has decided to join EPPEI as a continuing member of the membership its present operating company, the Central and South West, had in the former EPI for a number of years.

Mr. Jeff Gerken, strategic technology consultant, visited EPPEI in February 2002 and introduced AEP and its technology needs in a changing industry to a number of faculty and students from electrical, mechanical and chemical engineering at Texas A&M University. AEP also is a supporter of EPPEI research through its membership in PSerc.

Retirement Recognition

Mr. Charles W. Fromen Honored at the occasion of his Retirement

Charles W. Fromen was recognized with the EPPEI Retirement Award in October 2001. Fromen graduated from Texas A&M University in 1968, and started working for what is now known as Reliant Energy HL&P. Fromen served in many key technical positions in the protective relaying area and ended his career as a Senior Consulting Engineer. He then moved to Brazil in 1998 and worked at Eletropaulo Metropolitana as a Superintendent of Electrical System development until his retirement. Over the years, Fromen has shown great interest in the EPPEI Program, serving on the advisory board and supporting faculty research.

EPPEI Undergraduate/Graduate Scholarships and Fellowships For Power Engineering Students

Several Fellowships and scholarships are available to power engineering students provided by the Electric Power and Power Electronics Institute and funded by: ABB, American Electric Power, Entergy Services, Oncor Electric Delivery Company, PacificCorp. and Reliant Energy HL&P. Deadline for application submission is May 1 for scholarships starting in Summer/Fall and November 1 for scholarships starting in Spring. Interested students can visit http://eppe.tamu.edu/fincaid.shtml for more information.

The winners of 2001/2002 graduate fellowships were Yaman Cansin Evrenosoglu (Advisor: Dr. Abur), Slavko Vasilic (Advisor: Dr. Kezunovic), Mir Rasoul J. Mousavi (Advisor: Dr. Butler-Purry) and Farzad Rajaei Salmasi (Advisor: Dr. Ehsani).

The winners of Spring 2001/2002 undergraduate scholarships were Jeffrey H. Davis, William M. Odom, Hien Huy Nguyen, Ming-Jer Wang, Adam Snider, Lindsay Clem, Anand Chawla, Thomas Balez, Sean Patrick Heinroth and Steven Gerard Campbell.

Theses

S. Sulistijo, M.S., 12/01, Chair: P. Enjeti.
N. Qahtany, M.S., 5/02, Chair: H. Toliyat.

Dissertations

H. Gao, Ph.D., 12/01, “Sensorless Control of the Switched Reluctance Motor Drive at Standstill and Near-Zero Speed,” Chair: M. Ehsani.
B-K. Lee, Ph.D., 12/01, “Advanced Low Cost and High Performance Brushless DC Motor Drives for Mass Production,” Chair: M. Ehsani.
R. Shi, Ph.D., 12/01, “Vector Control of Five-Phase Synchronous Reluctance Machine with the Third Harmonic Current Injections for High Specific Torque,” Chair: H. Toliyat.
H. Xu, Ph.D., 12/01, “Enhanced Rotor Field Oriented Control Of Five-Phase Induction Motor With the Combined Fundamental and Third Harmonic Currant,” Chair: H. Toliyat.
In Other News...EPPEI faculty contracts & grants