

Center for Power Systems Studies
Semiannual Meeting -- Madison, SD
COORDINATOR'S REPORT
April 26, 2001

To: Members of Center for Power System Studies
Associate Members of Power System Studies
All those in attendance at this meeting

As we close the 33rd year of operation of the Center for Power Systems Studies we can be proud of the center's accomplishments and look with anticipation to the future.

- I. Project and research activities during fall 2000 and spring 2001 Terms
- a. Jim Steinmeyer (ME graduate) finished the design of a rail-mounted (mobile) dynamometer during the fall term.
 - b. James Ziebarth (through the Student Technology Fellow Program (SDSU) titled *New Software/Hardware Platforms for Use in Instruction of Energy Conversion Laboratory EE431*) assumed responsibility for integrating the rail-mounted dynamometer with LabVIEW and the National Instruments Data Acquisition card, such that torque and speed can be monitored at the PC.
 - c. Casey Sichmeller (graduating Spring 2001) and Troy Metzger (graduating Spring 2002), placed final design modifications to the Automated Load Bank (automated water rheostat, previous senior design project) and the Power Workbench Stations. Both Casey and Troy have been funded through CPSS.
 - d. Shawn and Michelle Fagan, (two SDSU graphics arts and journalism majors) designed and constructed the web page for the Spring 2000 North Central States Power Technology Tour. This work can be seen at the following URL

<http://learn.sdstate.edu/shietpas/cpss/fieldtrp/tour00/stevefront.html>

Both were employed by CPSS. The final outcome was great and considering doing this in the future, when warranted.

- e. *Design of the New Energy Laboratory – Phase II.*

Phase II of the Energy Laboratory, during the Fall semester of 2000 and Spring semester 2001, consisted of a system level design, wherein all design objectives and specifications were firmly established. A proposal document with all these details was written and serves as a point of reference for design. After this document was signed by the Electrical Engineering Department Head on January 22, 2001, the students became more involved in the detail design of the Utility Room, where the Automated Load Banks (ALBs) and power processing station (PPS) will be housed.

Vijay Kambhammettu (graduate student) has primarily worked on the design of the power processing station (PPS). Vijay has been funded through CPSS

James Ziebarth has assisted Vijay, giving attention to the drive requirements of the 3-phase AC and the DC contactors.

Center for Power Systems Studies
Semiannual Meeting -- Sioux Falls, SD
COORDINATOR'S REPORT
April 26, 2001

- f. Continued work on the NSF Course, Curriculum and Laboratory Improvement (Adaptation and Implementation, A&I) Grant for the period from January 1, 2000 to December 31, 2001. The title of the grant is *Improving Undergraduate Power Engineering Education: A System-Level Approach to Teaching Electromechanical Energy Conversion*.
Md. Sattar Abdus (graduate student) is designing and constructing a 3-hp Volts/Hz AC Induction Motor Drive and
Kandula M. Bhargav (graduate student) is designing a ½ –hp DC/DC motor drive for a PV submersible pump.
- g. Sudeep Pyakuryal (graduate student) is modeling of a portion of Otter Tail's Distribution system with the intent to model the effects of placing Wind Turbine Generators on the system. This work is supported by a special donation from Otter Tail.

II. Other scholarly/research activities

- a. South Dakota Regional Power Conference, "Power and the Changing Utility Environment," April 3, 2001, Brookings, SD
- b. Steve Hietpas serves on the paper review committee for IEEE Rural Electric Power Conference. Reviewed paper for the upcoming conference in Little Rock, Arkansas, KY, April 29-May 1, 2001
- c. Steve Hietpas serves on the review committee of IEEE Transactions on Industrial Applications associated with the Rural Electric Power Conference.
- d. Steven Hietpas and Michael Ropp "Incorporating Electric Drives into the Electrical Machines Course: A Systems Level Approach" to be presented at session number 26 -- Experimentation and Laboratory-Oriented Studies (DELOS) Division for the 2001 ASEE Annual Conference in Albuquerque, NM, June 24-27, 2001.
- e. Michael Ropp continues to consult on windpower-utility system interaction issues
- f. Michael Ropp also consults on HVDC transmission issues
- g. Michael Ropp is a reviewer for Progress in Photovoltaics, IEEE Transactions on Education and Transactions on Energy Conversion

III. New/Additional student opportunities and power/power related graduates.

- a. Continued the offering of *scholarships* to:
 - freshman/sophomore level (less than approximately 50 credits completed)
 - sophomore/junior level (less than approximately 80 credits completed)
 - junior/senior level (less than approximately 110 credits completed)

In the fall semester we had a number of senior-standing students receive scholarships. Of the six EE seniors, five graduate(d) either in the fall of 2000 or spring 2001, while one will return and graduate in the fall of 2001.

Fall of 2000 scholarship recipients were:

1. Scott Hoberg (EE Senior, graduated Fall 00, working for ABB)
2. Scott Sibson (EE Senior, graduated Fall 00, working for Black & Veatch, please see his letter to the CPSS)

Center for Power Systems Studies
Semiannual Meeting -- Madison, SD
COORDINATOR'S REPORT
April 26, 2001

3. Nate Wriedt (EE Senior, returned from a 9-month coop at MidAmerican Energy, will graduate Fall 2001)
4. Casey Sichmeller (EE Senior, graduates Spring 2001, accepted position with Interstates Controls Division)
5. Jason Kautz (EE Senior, graduated Fall 00, working for Rockwell-Collins)
6. Joel Perrozzi (EE Senior, graduates Spring 01, accepted position with United Defense)
7. Michael Uken (ME Junior)
8. James Ziebarth (EE Junior, expected graduation Spring 2002, will work on the Energy Lab design summer of 2001)
9. Troy Metzger (EE Junior, expected graduation Spring 2002, 2001 summer intern at DGR)
10. Andy Koob (EE Junior, expected graduation Spring 2002, 2001 summer intern at MAPP)

Spring of 2001 scholarship recipients were:

1. Paul Konechne (EE Junior, expected graduation Spring 2002, 2001 summer intern at MidAmerican)
2. James Ziebarth (EE Junior, see above)
3. Troy Metzger (EE Junior, see above)
4. Andy Koob (EE Junior, see above)
5. Jeff Renken (EE Sophomore, Trying to stay in the Sioux Falls area and obtain a 2001 summer intern at Interstates or DLR)

b. Other students who have obtained summer internship positions.

1. John Weber (EE Sophomore, 2001 summer intern at Missouri River Energy Services)

c. Other students who may obtain summer internship positions.

1. Adam Graff (EE Sophomore, 2001 summer intern at MidAmerican)
2. Matt Rust (EE Sophomore, 2001 summer intern at MidAmerican)

IV. Faculty/Power Program/and Power Related Classes

Wayne Knabach (Fall 2000)

1. Taught EE492 (2 cr), Special course on *Power Systems I* Students who took the course were, Scott Hoberg, Scott Sibson, Nate Wriedt, Casey Sichmeller, and Joel Perrozzi.

Steve Hietpas (Spring 2001, and future)

1. Taught EE615 (3 cr) *Advanced Linear Systems*, 13 graduate students
2. Taught EE221 (3 cr) *Circuits I*, 17 students, 3-5 look interested in power systems.
3. Taught EE464 (2 cr) *Senior Design I*, 11 students and 8 projects, Dr. Ropp is supervising one power related project.
4. Supervised EE693 (2 cr), Special course on *Power Systems I* for James Haigh, who has accepted a position at WAPA in Watertown, starting this summer.

Center for Power Systems Studies
Semiannual Meeting -- Sioux Falls, SD
COORDINATOR'S REPORT
April 26, 2001

5. Supervised EE693 (2 cr), Special course on *Power Electronics* for Md. Abdus Sattar, Kandula Mallikarjun Bhargav, and Vijay Kambhammettu
6. Supervised EE693 (2 cr), Special course on *Power Systems and Windpower* for Sudeep Kumar Pyakuryal
7. Supervise Phase II of the Energy Lab Design during the summer of 2001. Hired Vijay Kambhammettu, James Ziebarth, and Nate Wriedt.
8. Supervise Sudeep Kumar Pyakuryal on the Otter Tail Windpower Project during the summer of 2001.
9. Supervise Md. Sattar Abdus (graduate student) is designing and constructing a 3-hp Volts/Hz AC Induction Motor Drive and Kandula M. Bhargav (graduate student) is designing a ½ -hp DC/DC motor drive for a PV submersible pump over the summer of 2001.
10. Taking 10 students on the Spring 2001 North Central States Power Technology Tour, May 14-18.
11. Considering how to supervise or teach EE492 (2 cr), Special course on *Power Systems I* James Ziebarth, Troy Metzger, Andy Koob and Paul Konechne, in the Fall of 2001

Michael Ropp (Spring 2001, and future)

1. Integrating power electronics concepts into the junior-level Electronics course sequence
2. Teaching a new course on distributed generation that includes multiple power-related technologies, including optimal system design and operation, batteries, and generation technologies
3. Supervising two power-related Senior Design Projects
4. Establishing research in distributed generation

Respectfully submitted,

Dr. Steven M. Hietpas
Coordinator, Center for Power System Studies
Associate Professor of Electrical Engineering