

Wind Workshop 2003
University of Minnesota
Oct 8-10, 2003

Sponsored by:

National Science Foundation,
XcelEnergy
NASA

University of Minnesota Department of Electrical and
Computer Engineering

Objective:

To bring together the developers, vendors, researchers and interested parties with the objective of discussing progress and technical challenges in harnessing wind energy at a large scale.

Wednesday Oct 8, 2003 4:00-6:30PM

A Tutorial

Principles of Electric Drives for Harnessing Wind Energy

Prof. Ned Mohan

Univ. of Minnesota (2-120 Molecular Cellular Biology)

Based on NSF-sponsored developments at the University of Minnesota, in this tutorial, we will examine, in simple terms, the basic concepts of electro-mechanical energy conversion, and then discuss how ac machines operating at variable speed can be used as generators, to feed power into the utility grid through power electronics. Prerequisite: Basic electrical engineering background. Reference Books: *Electric Drives: An Integrative Approach* and *Advanced Electric Drives* by Ned Mohan.

Thursday Oct 9, 2003

- 8:00 – 8:30 **Registration, Coffee**
- 8:30-10:15 **Opening Session**
- Welcoming Remarks by the IT Dean – Ted Davis
 - Agenda – Ned Mohan
 - National Renewable Energy Lab’s Perspective – Mike Robinson (NREL)
 - Potential and Challenges – John Dunlop (American Wind Energy Assoc)
 - Various Wind Electric Arrangements; Pros and Cons; Present and Future: Prof. Frede Blaabjerg (University of Aalborg, Denmark)
- 10:30-12:00 **Harnessing of Wind Energy from Manufacturers' Perspective**
- GE Wind – Mark Eilers
 - NEG-Micon – Leif Andersen, Jesper Michaelsen
 - Vestas – Bob Zdebski
- 1:30-3:00 **Large-Scale Integration of Wind into Utility Systems:**
Dr. Terje Gjengedal, Session Chair (VP, Statkraft, Norway)
- Robert Zavadil – EnerNex
 - Tim Seck – Great River Energy
 - Jarred Miland– Alliant Energy
 - Terje Gjengedal - Horns Rev: the first large-scale offshore wind farm
- 3:30- 5:30 **Brainstorming Session: Possibilities and Challenges**
Panelists: Mark McGree (Xcel), Tim Seck and Ivars Vancers (GRE), Beth Soholt (Wind on the Wires), Tim Rogelstad (Otter Tail Power), Bill Grant (Izaak Walton League), Wally Lang (Minnkota), Rick Halet (Xcel)
- 5:30-8:00 **Reception and Banquet**
- After-Dinner Speaker - Dr. Terje Gjengedal (Vice President - Statkraft, Norway) - Power Engineering Challenges in Large-Scale Wind Power Integration: Experiences from Norway

Friday Oct 10, 2003

8:30-10:00 **Energy Storage to Make Wind Energy Dispatchable:**
Dr. Barbara Kenny, Session Chairperson (NASA Glenn Research Center)

- The NASA Flywheel Development Program – Kerry McLallin (NASA)
- Hydrogen Connection: Electrolysis and Fuel Cells - John Goodman (Entegris Corporation)
- Inertial Energy Storage Research at the University of Minnesota, Todd Begalke, Philip Jose and Ned Mohan

10:30-12:00 **Wind-Related Research**

- Wind Resource Assessment and Regional Mapping – Rory Artig (MN Dept of Commerce)
- New Techniques in Site Assessment and Wind Forecasting – Lee Alnes, (SSESCO, Inc.)
- Composite Conductor: A New Material for Transmission Lines – Doug Johnson (3M)
- Minimizing Torque Pulsation under Utility Unbalance and Providing Voltage Support – Ted Brekken and Ned Mohan, University of Minnesota

1:30-3:00 **Poster Session**

- Invited Papers on Relevant Developments, Specifications, Standards, and Research. This session will be very informative, providing a chance for in-depth interaction with the presenters.