



Date:

Friday, March 26, 2010

Time:

3:30 p.m. – 3:50 p.m.

Presentation:

“Power Smoothing for Wind Turbine Gearbox Stress Reduction”

Daniel Neumann
Student, Milwaukee School of Engineering

Recent developments in wind production and projections of the wind energy market will be presented. As wind energy reaches deeper market penetration there are three primary areas that need further research: wind energy storage, control topologies, and gearbox fatigue analysis. Wind is inherently varying with time and intensity which makes it a fairly unpredictable energy source. Research in both long and short term energy storage will be reviewed. Control strategies to address frequency droop, pitch control, and power smoothing will also be discussed. Gearbox stress reduction is of particular importance given the large costs of gearbox repair and replacement. Our current research is centered on developing a dynamic model to use in conjunction with new control strategies aimed at reducing the transmitted stresses through the gearbox. A first approximation dynamic model of the gearbox has been developed using Matlab Simulink®. Stages of increasing complexity in the dynamic gearbox model will be previewed.

Presenter Biography:

Daniel Neumann

Daniel Neumann is an undergraduate mechanical engineering student at the Milwaukee School of Engineering. His academic interests are with thermal and fluid sciences. He is particularly interested in research topics pertaining to cogeneration, wind energy, and external combustion devices such as the Stirling engine. Currently he is working on a collaborative project funded by the Southeastern Wisconsin Energy Technology Research Consortium (SWETRC). The project is lead by Dr. Adel Nasiri of UW-Milwaukee, with Dr. Nabeel Damerdash of Marquette University, and Dr. Christopher Damm of MSOE as the other collaborators. His work on this project is related to dynamic gearbox modeling.