

Monthly CREW Update: March 2012

Here is an update on past and upcoming activities as well as opportunities:

1. Seminar series:

On February 24, 2012, Prof. Mark Balas, University of Wyoming, talked about “Adaptive Control of Utility-Sized Wind Turbines in Operating Regions 2 & 3.” Prof. Balas started off his talk by mentioning that if the US wants to reach 20% of the US power, offshore wind will have to be developed, simply because wind resources on land are far away from the load centers that need the electrical power...The real concentration of wind is on the coasts. Nevertheless, he pointed out that “20% is a gigantic amount!” Mark Balas continued with some background informative slides, one of them mentioning that the largest wind turbine in use now is a 5-MW turbine with a rotor diameter of 126 m. Prof. Balas presented very interesting details of control approaches and challenges under numerous conditions, e.g., LLJ and unknown disturbances in general, including the 1-state and 7-state models for behavior analyses of wind turbine. In the second part of his talk, Prof. Balas reviewed the state of knowledge of offshore wind and discussed (theory and analytical modifications to theory of) adaptive control for offshore wind to moderate regions 2 & 3 of the power curve. Prof. Balas concluded with a cute slide on “adaptive control in action” with a toddler from a former student of his who knocks a garbage can and notices that she has to adapt if she wants to close the lid.

On March 9, 2012, Prof. Wei Qiao, University of Nebraska-Lincoln talked about “Current-Based Online Condition Monitoring for Wind Turbines”. Prof. Wei Qiao provided some background information on the importance of condition monitoring (CM) for wind turbines, in particular online CM and for small wind turbine systems. He also presented the current technologies used for CM. Prof. Wei Qiao introduced the online non-intrusive CM technology that they are currently working on, which only uses current from the wind turbine generator and therefore requires no additional sensors or data acquisition devices. First, Prof. Wei Qiao explained the theoretical foundation of simple cases of current-based CM. Thereafter, the presentation was about interesting experimental analyses focusing on rotor and blades as well as bearings, which are among the wind turbine components that fail more often. Among the numerous wind-tunnel testing observations and results that Prof. Wei Qiao conducted and presented here, some tests focused on blade imbalance (one of the three blades had an additional mass of 1.25 to 5%), blade bending (one of the three blades was bent at 2 to 6 degrees), and other imbalance faults, e.g. in bearings.

2. Seminar series: Please join us for the last monthly seminar of the Spring semester, which will take place on April 13 at Colorado State University (room Routt Hall) at 9:00am-10:00am, with Prof. Dionysios Aliprantis from Iowa State University. Please visit the CREW website for more information about the talk:

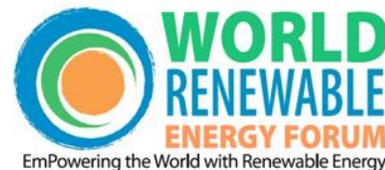
<http://crew.colorado.edu/SeminarSeries2012>

As in the past, our seminar will be broadcast live!

3. On March 2, 2012, the National Renewable Energy Laboratory (NREL) hosted a one-day workshop on the NREL-developed wind turbine computer-aided engineering (CAE) software tools. The workshop was once again a success where the room capacity of 60 attendees was reached and unfortunately there was a waiting list that could not be satisfied. The format was similar to the CAE workshop CREW hosted last spring, with some updated information and improvements. Thirteen of the attendees were from industry. The rest were from universities or national laboratories.

4. The 2012 Western Energy Policy Research Conference will be on August 30-31, 2012. The Energy Policy Institute at Boise State University will host the event in Boise, Idaho. Nobel prize winning scientist Daniel M. Kammen will be the keynote speaker at the conference luncheon. The Call for Paper Proposals is now open, and travel assistance available for presenters can be available. More information is available at <http://epi.boisestate.edu/conference>
Deadline for submitting proposals: May 4, 2012.

5. The World Renewable Energy Forum (WREF 2012), the premier international renewable energy conference, will be held in Denver, CO on May 13-17, 2012. Organizers are proud to share that renewable energy researchers from around the world have submitted more than 800 abstracts and proposals for an additional 158 panels, forums and workshops. This



is spectacular response, more than doubles the number of papers submitted for the 2011 conference held last May in Raleigh, N.C. “We’re delighted to see that the level of participation reflects the vigorous progress in deployment of renewable energy technologies around the world,” noted Susan Greene, president of the American Solar Energy Society. “The conference is going to be a goldmine of information and networking contacts for renewable energy professionals, clean energy advocates and students.” Scientists, engineers, architects and economists from 66 nations and 37 states sent in proposals for presentations. The United States leads the count with 400 submissions, including 144 from national laboratories operated by the U.S. Department of Energy, and 191 from university faculty and students. For the first time, the American Solar Energy Society’s National Solar Conference will be held under the same roof with the biennial World Renewable Energy Congress. More than 2000 attendees are expected. For more information about WREF 2012, and to register for the conference, please visit: www.wref2012.org

6. Please alert students, recent graduates, and colleagues to the following opportunity:

- a. Earth-related job search engine: EarthWorks is an extensive listing of physical science jobs. Numerous categories of interest: Renewable Energy, Electrical

Engineering, Environmental Engineering, Climate/Atmospheric Science, etc.
Please visit: <http://www.earthworks-jobs.com/>

Hope everyone enjoyed or enjoys their spring break!