

## Tuesday – October 3, 2006

### **Why are we here?**

*Welcome and Purpose of the Workshop* – Roger Hill (SNL)

*Research and Development Roles* – Sandy Butterfield (NREL)

*Benchmarking Reliability and Industry Activities* – Thomas Jonsson (AWEA O&M Working Group Chairman)

### **Managing Costs of Unreliability**

*Managing Wind Turbine Generation O&M Costs Through Failure Prediction and Proactive Maintenance* – Mike Smith (enXco)

*Potential Wind Turbine Reliability Affects on a Project Pro Forma* – Bill Vachon, (W.A. Vachon & Associates, Inc.)

*An Owner's Perspective* – Neal Emmerton (Babcock & Brown)

*Reliability Impact of Distributed and Renewable Energy Resources: Case Study* – David Robinson (SNL)

### **Perspectives for Reliability Improvements**

*The Vestas Perspective of Reliability* – Mark Cookson (Vestas)

*Wind Turbine Reliability and Service Improvements* – Ben Bell (Bell Windpower)

*Utility Wind Interest Group Wind Turbine O&M User Group* – Steve Wotruba (Energy Northwest)

*North American Wind Research and Training Center* – Dr. Phillip O. Barry (Mesalands Community College) [Spoken Address]

### **Gearbox Issues**

*Gearbox Repair Experiences* – Thomas Jonsson (Moventas)

**NOTE: 12.4MB pdf file also available with embedded videos.**

*Lubrication...How's That Working For You?* – Brian O'Connor (Lubrizol Corporation)

*Wind Turbine Gearbox Reliability* – Brian McNiff (Gear Engineers, Inc.)

*Wind Turbine Gearbox Reliability Collaborative* – Walt Musial (NREL)

### **Controls, Power Electronics and Generators**

*Conclusions from NREL Predictive Maintenance Management Workshop* – Sandy Butterfield (NREL)

*Generator & Electrical System Reliability* – Hal Romanowitz (Oak Creek Energy Systems, Inc.)

*Accelerated Life Testing of Generator Insulation Systems* – Bill Erdman (BEW Engineering, Inc.)

## Wednesday – October 4, 2006

### **Reliability Review**

*Yesterday's Recap–Review of Key Points* – Roger Hill (SNL) [Spoken Address: See *Meeting Notes* below]

*The Link Between Land-based Reliability and Offshore Systems* – Walt Musial (NREL)

### **Pitch Systems**

*Pitch Systems: Overview and Introduction* – Ed Hahlbeck (Powertrain Engineers, Inc.)

*Factors Influencing Wind Turbine Reliability in Pitch System Designs* – Paul Rowan (MLS Electrosystem)

*Yaw & Pitch System Lubrication* – Brian Richards (SKF Vogel)

### **Blades: Larger and Lighter, How Reliable?**

*Blade Issues, Reliability & Innovations* – Tom Ashwill (SNL)

*Lightning and Other Stuff That Bother Wind Turbines* – Brian McNiff (McNiff Light Industry)

*Economic Benefits of Scheduled Rotor Maintenance* – Gary Kanaby (Knight and Carver)

### **Reduced Turbine Costs in the Life Cycle**

*O&M Cost Model: Quantifying the Influence of Reliability* – Chris Walford (Global Energy Concepts)

*Crane Considerations Related to Maintaining Wind Turbines* – Bill Vachon (W.A. Vachon & Associates, Inc.)

### **Reduced Turbine Costs in the Life Cycle (continued)**

*Design for Maintenance* – Ed Hahlbeck (Powertrain Engineers, Inc.)

*Condition Monitoring as a Tool for Reliability/O&M* – Harry Timmerman (SKF)

### **Operators' Remarks**

*Improving Wind Farm Performance Using Reliability Centered Maintenance* – Chanda Kapande and Robert O'Brien (B9 Energy)

*Managing the Fleet: 600kw to 800kw Turbines* – Dean Landon (Caithness Energy)

### **Group Discussion, Wrap-up**

*Meeting Notes of the 2006 Wind Turbine Reliability Workshop* – Roger Hill