

# Program

## 2nd Wind Turbine Reliability Workshop

Hosted by:  
Sandia National Laboratories  
Co-Hosted by:  
National Renewable Energy Laboratory (NREL)  
American Wind Energy Association (AWEA)  
And supported by  
The US Department of Energy

**Monday, September 17**

**7:30 am**

**Registration, Continental Breakfast**

### **Welcoming Remarks, Importance of Reliability**

**8:30 am**

- *Welcome, Perspectives on an Expanded Wind Role in the National Portfolio*, Stan Calvert, US Department of Energy
- *Renewable Energy “Surety”*, Les Shephard, Sandia National Laboratories
- *Reliability Program Goals and Status; Purpose of the Workshop*, Roger Hill, Sandia National Laboratories
- *North American Wind Research and Training Center*, Jim Morgan, Mesalands Community College

**9:45 am**

**Break**

*(Refreshments for all breaks and lunches will be served in an adjacent ballroom where vendors and consultants will be displaying informational materials)*

### **Foundations of Reliability – Ensuring Reliability Needs Are Met**

*(Paul Veers moderator)*

**10:15 am**

Reliability considerations begin at the site assessment phase and continue throughout the lifetime of the plant. This session will discuss how risks are managed and how high reliability and service needs are addressed.

- *Wind Turbine Design Standards: Influence on Reliability*, Paul Veers, Sandia National Laboratories
- *Turbine Class Selection and Layout Design According to Site Conditions*, Dan Bernadett, AWS Truewind
- *Reliability Observations of a Large Wind Farm Operator*, Larry Barr, enXco
- *Reliability Centered Maintenance and SCADA*, Patrick Quinlan, Second Wind
- *Discussion*

**12:00 pm**

**Lunch**

## Expanding Markets – Considerations of Reliability and Improving Availability

*(John Dunlop moderator)*

1:00 pm

The growth of the wind market continues apace. Industry leaders will address how these considerations are factored into the design, operation and maintenance of a wind farm.

- *Technology and Reliability Improvements in GE's 1.5 MW Fleet*, James Maughan, General Electric
- *Reliability Oriented Methodology For New Turbine Operation*, Jordi Roca Carbonell, ECOTÈCNIA
- *Clipper's Design Approach to Improving Reliability and Integrated Condition Based Monitoring*, Shaw Makaremi, Clipper Wind
- *Discussion*

2:45 pm

Break

## Reliability Practices, Case Studies, Tools, and Techniques

*(Sandy Butterfield moderator)*

3:15 pm

This afternoon session will identify ways that assessing failures, faults, and other reliability issues can be performed and also provide information on useful ways to characterize reliability performance.

- *Operating Wind Plant Monitoring and Performance Optimization*, AnneMarie Graves, Garrad Hassan America
- *Tools for Estimating Operation and Maintenance Costs of Offshore Wind Farms*, Tom Obdam, Energy Research Center of the Netherlands
- *Reliability Centered Maintenance Applied to Jet Engine Maintenance*, Jim Henry, Standard Aero
- *Wind Farm Modeling, and Prognostic Opportunities*, Jennifer Stinebaugh and Dan Briand, Sandia National Laboratories
- *Discussion*

5:00 pm

Close

5:15 pm - 6:45 pm

Wine and Cheese Reception

*Workshop attendees are invited to a wine and cheese reception graciously hosted by the North American Wind Research and Training Center of Mesalands Community College in Tucumcari, NM.*

## Tuesday, September 18

7:00 am

Registration, Continental Breakfast

**Attendees may choose between the following sessions:**

**8:00 am**

- A. Gearboxes, or
- B. Blades and Structures

**10:15 am**

- A. Plant Wide Health Monitoring and Reliability Centered Maintenance/Design (RCM/D) Approach, or
- B. Electrical and Utility Power System

## **Gearboxes**

*(Brian McNiff moderator)*

**Session A: Main Ballroom**

**8:00am**

Gearbox failures have been a major source of uncertainty in planning and managing O&M costs. This session will discuss what has been done to help manage existing systems and what should be done in the future to improve reliability and reduce the costs of maintaining gearboxes.

- *Gearbox Reliability Collaborative*, Brian McNiff, McNiff Light Industry
- *Gearbox Failure Overview from a Rebuilder's Perspective*, Paul Baker, Moventas
- *Experience with CalWind's Condition Monitoring System*, Jon Powers, CalWind Resources
- *Discussion*

## **Blades and Structures**

*(Paul Veers moderator)*

**Session B: Las Cruces/Cimarron Room**

**8:00 am**

This session will address operational issues with turbine blades and other structures. Detecting failures and approaches to repairs will be addressed.

- *Addressing Safety Margins in Reliability-Based Design of Wind Turbines*, Lance Manuel, University of Texas
- *Practical Experiences in the Repair of Blades*, Gary Kanaby, Knight and Carver
- *Predictive Maintenance for Pitch Systems*, Paul Rowan, MLS Electrosystem
- *Discussion*

**9:45 am**

**Break**

## **Plant Wide Health Monitoring and Reliability Centered Maintenance/Design (RCM/D) Approach**

*(Sandy Butterfield moderator)*

**Session A: Main Ballroom**

**10:15 am**

Reliability Centered Maintenance and Health Monitoring can provide valuable methods for protecting equipment and extending lifetimes. This session will address ways to advance understanding of the issues as they relate to turbines.

- *Comprehensive Health Monitoring for Wind Turbines*, Chris Walford, Global Energy Concepts
- *Cost Effective Retrofit Condition Monitoring Systems*, Joe van Dyke, DLI Engineering
- *Data Fusion Applied to Helicopter Gearbox Condition Assessment*, Paula Dempsey, NASA Glenn Research
- *Capitalizing on Existing SCADA Data*, Justin Judkins, Ridgetop Group
- *Discussion*

## Electrical and Utility Power Systems

*(Roger Hill moderator)*

**Session B: Las Cruces/Cimarron Room**

**10:15 am**

About half of the failures in a wind farm are electrical in nature. This session will address the electrical systems, their importance, and operational issues.

- *Large-Scale Wind Generation: Impact On Grid Reliability*, Abraham Ellis, PNM
- *Wind Turbine Generators: Operation, Maintenance and Repair*, Tom Ellenbecker, TRICO TCWIND
- *North American Electric Reliability Corporation - Generating Availability Data System (GADs)*, Mike Curley, NERC
- *Discussion*

**12:00 pm**

**Lunch**

## Organizational Activities

*(John Dunlop moderator)*

**1:00 pm**

Several organizations are working in areas related to Operations and Maintenance and reliability related efforts. We will hear from and about the:

- *AWEA O&M Working Group*, John Dunlop, AWEA
- *UWIG O&M Turbine Working Group*, Larry Barr, enXco
- *Gas Turbine Failure Database*, Sal DellaVilla, Strategic Power Systems
- *Discussion*

## Operator's Experiences

*(Jennifer Stinebaugh moderator)*

**1:45 pm**

A panel of wind farm operators will participate in a moderated session where common issues will be discussed and the audience can ask questions. This session will serve as a precursor to the open discussion at Workshop end.

- *Moderated Session of Wind Farm Operators*
  - Larry Barr, enXco
  - Roy Blackshear, American Electric Power
  - Neal Emmerton, Babcock and Brown
  - Jon Powers, CalWind Resources
- *Audience Questions and Discussion*

**Short Break (at least 5 minutes)**

## Recap and Group Discussion, Wrap-up

*(Roger Hill and Sandy Butterfield moderators)*

**2:45 pm**

All participants are invited to share ideas and constructive criticisms related to reliability issues in a moderated discussion. Notes will be kept and minutes issued later.

**4:00**

**Adjourn**