

Wind Turbine Tribology Seminar

November 15-17, 2011

at

*Renaissance Boulder Flatiron Hotel
Broomfield, CO, USA*

Day 1 (Nov. 15)

8:30 *Introduction* (Paul Veers)

8:45 *Challenges facing wind turbine tribology, main bearing failure modes, and coating to prevent failure* (Gary Doll, University of Akron)

Session 1: Tribology Fundamentals (Robert Errichello, GEARTECH)

9:45 Break

10:00 *EHL fundamentals* (Vern Wedeven, Wedeven Associates, Inc.)

11:00 *EHL surface interactions in micropitting* (Pwt Evans, Cardiff University, UK)

12:00 Lunch

1:00 *Lubricant properties influencing EHL film thickness and traction properties (TBD)*

Session 2: Lubricant Fundamentals (Bill Herguth, Herguth Laboratories, Inc.)

2:00 *Lubricant Fundamentals (TBD) formulation*

3:00 Break

3:30 *Lubricant Fundamentals (TBD)*

4:30 *Lubricant Fundamentals* (Henri Braun, ExxonMobil) grease

5:30 Adjourn for Evening

6:00 **Cocktail Party**

sponsor TBD

Day 2 (Nov. 16)

Session 3: Tribology and Lubricant-Related Wind Turbine Failures (Shawn Sheng, NREL)

8:00 *NREL gearbox reliability collaborative failure database project* (Mark McDade, NREL)

8:30 *Bearing and gear failure modes seen in wind turbines* (Bob Errichello, GEARTECH)

9:30 Break

10:00 *Microstructural alterations in Hertzian fatigue* (Bob Errichello, GEARTECH)

11:00 *Classic bearing failure modes (TBD)*

12:00 Lunch

Session 4: Root Cause Hypotheses (Brian McNiff, McNiff Light Industry)

1:00 *Introduction* (Bob Errichello, GEARTECH)

1:15 *NSK hypothesis-* (someone, NSK)

2:15 *SKF hypothesis-* (Jürgen Gegner, SKF)

3:15 Break

3:45 *Hansen hypothesis -* (Johan Luyckx, Hansen Transmissions)

5:00 *Schaeffler hypothesis-* (Walter Holweger, Schaeffler)

6:00 Adjourn for Evening

6:30 Dinner arranged by NREL but paid by individuals

Day 3 (Nov. 17)

Session 5: Possible Solutions (Jim Johnson, NREL)

8:00 *Selecting synthetic gear oil (TBD)*

9:00 *Gear superfinishing (Lane Winkelmann, REM)*

10:00 Break

10:15 *Surface treatment and nano lubricant (Ali Erdemir, ANL)*

11:15 *New lubricant (Manfred Jungk, Dow Corning)*

12:15 Lunch

Session 6: R&D Roadmap Development (Aaron Greco, DOE)

1:30 Future R&D Areas

3:30 Tour of Dyno and NWTC

3:45 Adjourn