

# WIND ENERGY FORUM

TUESDAY MARCH 24 2009

2:30 PM – 5:00 PM

## RIDING HIGHER WITH COMPOSITE SOLUTIONS



### Moderator

● **General Electric, Global Research.**  
**Dr Christophe Lanaud, Research Laboratory  
Manager.**

Responsible for leading the composite manufacturing team, developing and introducing new composite manufacturing processes and equipment.

Received a Ph.D. in Applied Mechanics from the French Petroleum Institute. Joined GE in 2000 as part of the steam turbine conceptual design team. Joined GE Global Research in 2002 as a mechanical engineer in the Advanced Material Systems Applications Laboratory.



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● **General Electric, Global Research.** Dr Christophe Lanaud, Research Laboratory Manager

- The wind energy market and current trends
- A need to introduce lightweight materials like carbon fibre and automated manufacturing techniques
- Making larger wind turbines economically viable

### SIMULATION

#### 2 The Benefits of CAD-Integrated Composite Design Software for the Engineering of Wind Turbine Composite Parts 13

● **Vistagy, Inc.** Oliver Guillemain, Director, Product and Market Strategy

- A faster and more robust composite part design process
- Multiple manufacturing processes supported, including hand lay-up, resin infusion and automated deposition manufacturing methods and variants
- Examples to illustrate how such a specialized CAD environment can be applied to composite parts of various sizes and degrees of complexity

### NEW DEVELOPMENTS

#### 3 Advances in Epoxy Technology for Windmill Blade Composite Fabrication 25

● **Dow Deutschland GmbH & Co. OHG.** Hoewel Bernd, Technical Service Leader Wind Composite

- Technical advances to improve the performance and reliability of windmill blade composites
- Epoxy composites: high performance and proven reliability in many demanding applications including windmill blades
- Toughness improvements to address failures in composite applications such as cracking
- New developments to deliver performance and productivity improvements

#### 4 Taking Advantage of Nanoparticles for Wind Energy Applications 37

● **Nanolegde.** Patrice Lucas, R&D Project Manager

- Wind Energy requirements identification
- Nanoparticles integration in epoxy matrix
- Resulting composite materials characterization: Results and discussion