

# SKF University Technology Center - Advanced Condition Monitoring

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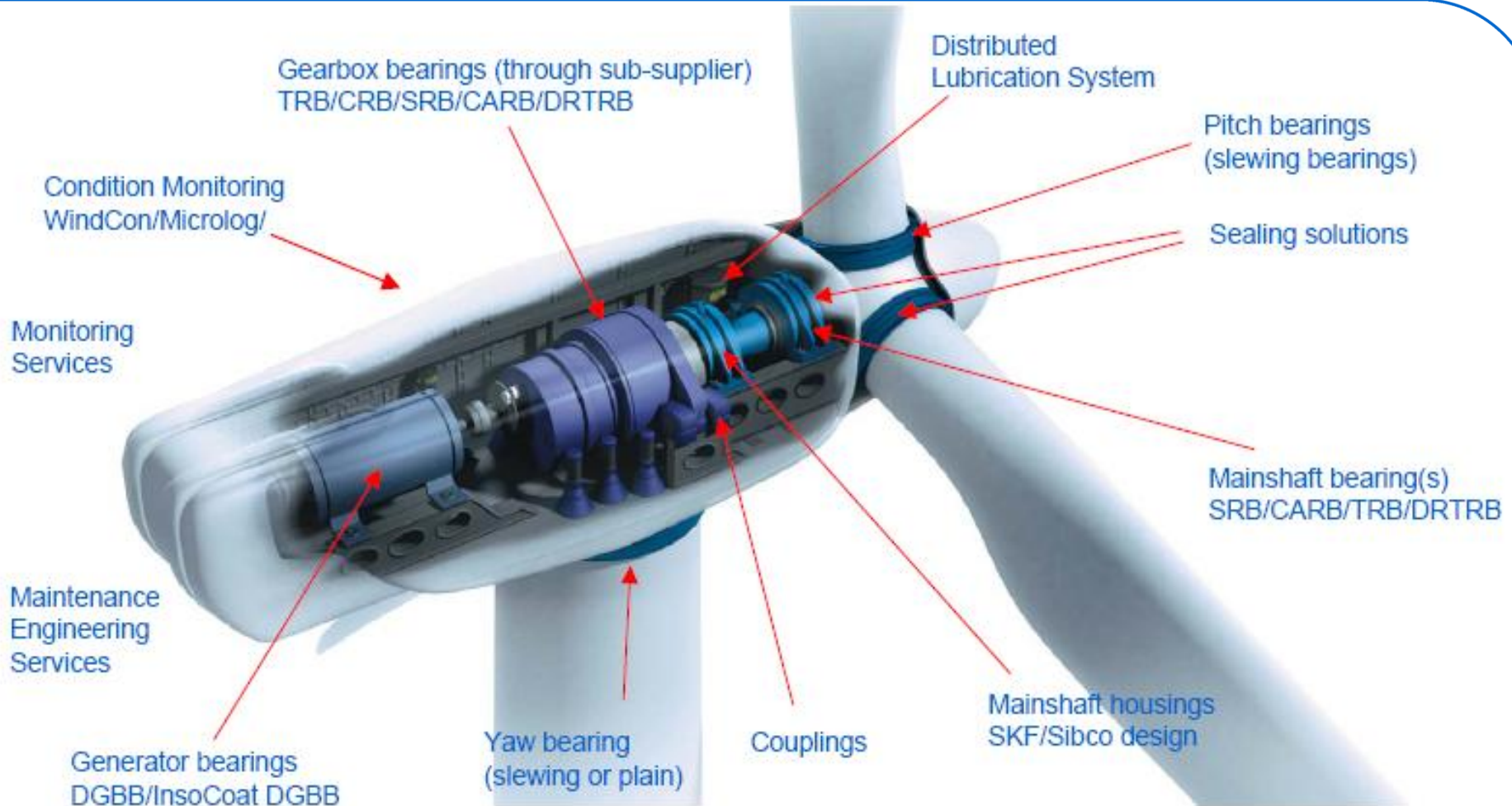
2015-02-02

Winterwind Conference 2015



**SKF**®

# SKF offer in wind energy



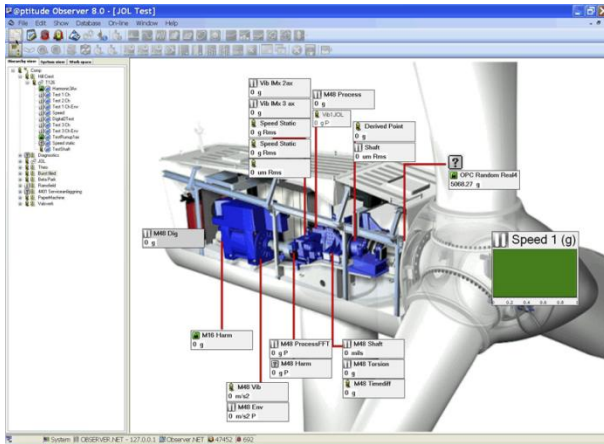
# WindCons around the world (September 2014)



# WindCon is standard on the RePower 6 MW



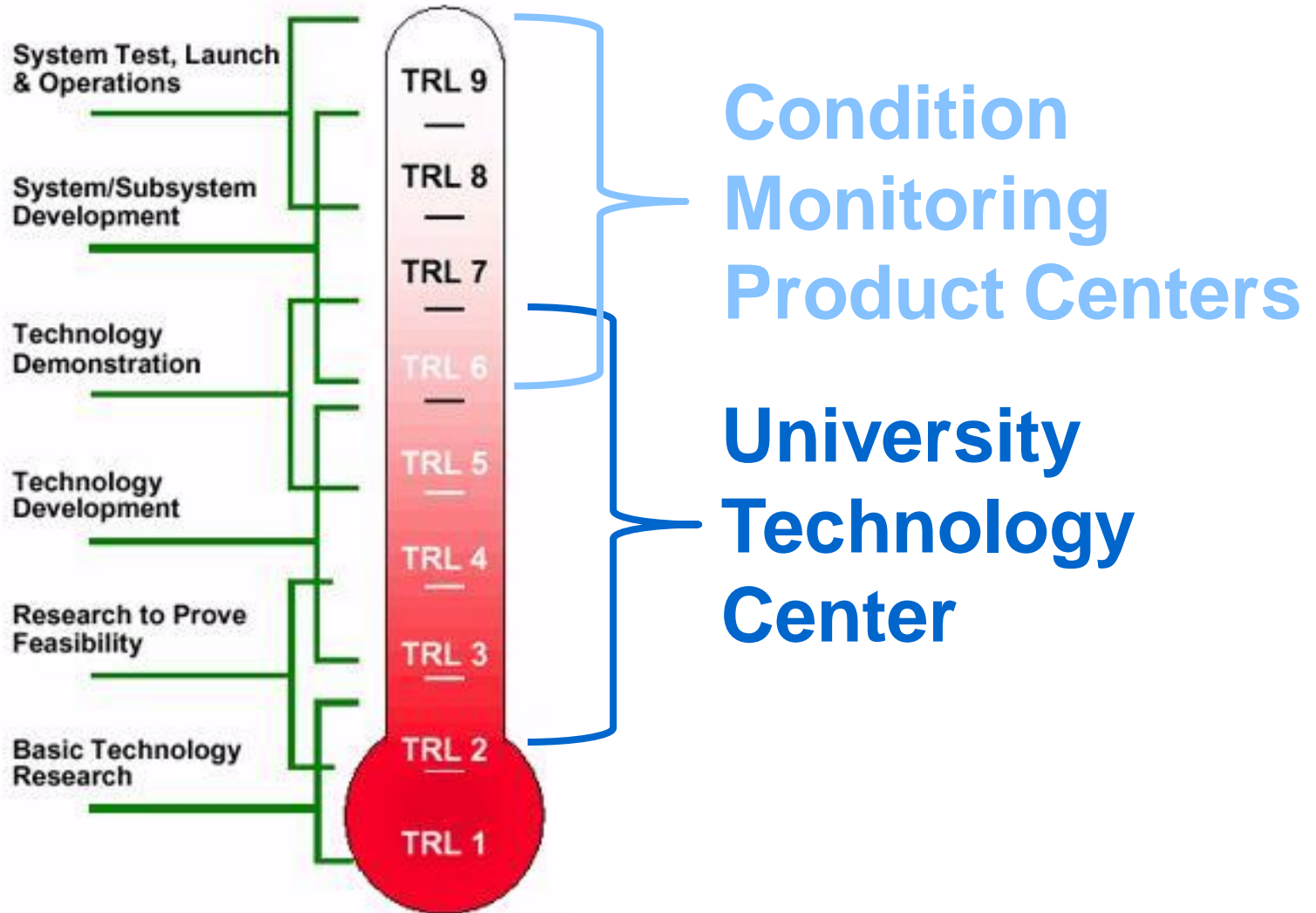
# Connecting WindCon with WindLub



# SKF University Technology Center - Luleå



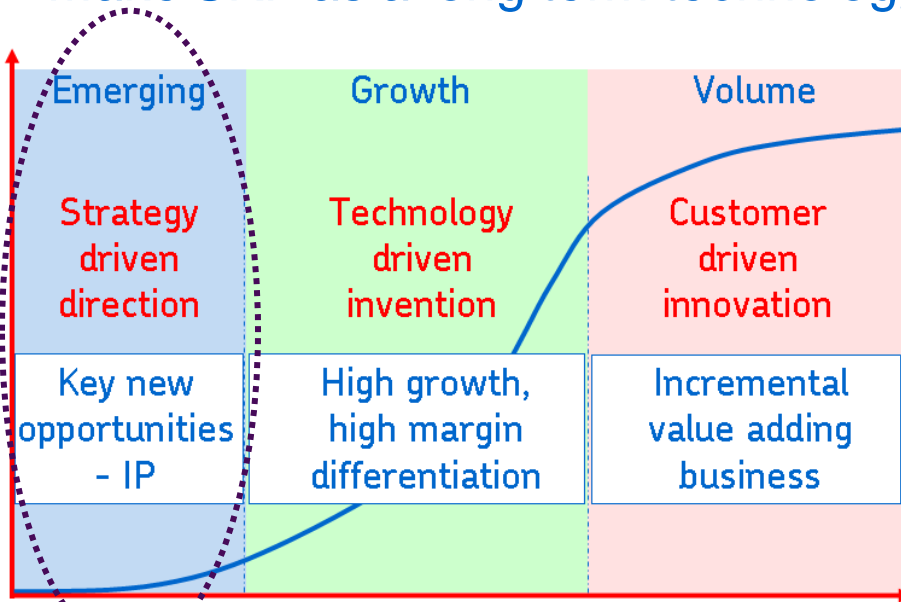
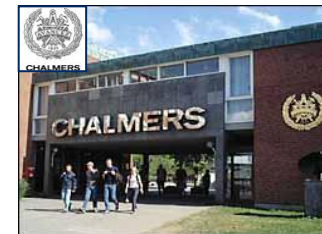
# Technology Readiness Level



# Strategy driven direction

## University Technology Centres - Purpose

- Support our activities in key areas
- Create a critical mass
- Create partnership with world class universities
- Get early access to important knowledge
- Make SKF as a long term technology leader





# Key areas– UTC support

- Steel and heat treatment
- Non-metallic material
- Sealings
- Sensor technology / Condition Monitoring
- Tribology
- Modelling and simulation
- Lubrication
- Sustainability / Environment

Cambridge

Tsinghua

Luleå

Imperial College

Chalmers



# SKF Luleå UTC

- SKF has been cooperating with LTU in Tribology and Condition Monitoring for many years
  - Creates a formal relationship
  - Creates a long term partnership with LTU
- Partnership to take CM to the next level
  - The bearing is an ideal place for a sensor
  - SKF is world leader in bearings as well as in CM
  - Customers want reliability – want to know what is going on

Great opportunity for technology and business growth

# Project at LTU – Wind Power in Cold Climate

Project financed by the Swedish Energy Agency



# Project at LTU – Wind Power in Cold Climate

Project Manager: Prof. Jan-Olov Aidanpää

WP1 – Ice formation and detection

WP2 – Fluid-structure interaction

WP3 – Ice monitoring with smart bearings



# WP3 – Ice monitoring with smart bearings



# WP3 – Ice monitoring with smart bearings

- Detect load on bearings, blades, due to e.g. ice formation
- Existing sensors in combination with new sensors
- To know when to start de-icing systems and to detect if the de-icing operation was successful

# SKF WindLub – Condition Based Lubrication

**Delivering...**



**SKF Condition Based Lubrication**  
Increase wind turbine reliability by combining SKF condition monitoring and automatic lubrication systems



Windup 1 Windup 2  
OUT1 OUT2 A2 E2

Onshore and offshore, anything that can prevent an up-tower service trip contributes to increased worker safety and reduced maintenance costs. Accordingly, demand for greater equipment serviceability and intelligent, connected solutions is increasing. Consequently, condition-based maintenance to extend wind turbine life cycles is gaining importance. SKF provides several proven solutions, including the SKF WindCon on-line condition monitoring system, plus a range of automatic, centralized lubrication systems.

To complement these offerings, an active interface has been added to the range. SKF Condition Based Lubrication links together SKF WindCon and SKF WindLub, featuring SKF and Lixis lubrication systems. It enables an automatic, additional dose of lubrication to turbine bearings in distress and offers full monitoring of the lubrication pump. SKF Condition Based Lubrication allows original equipment manufacturers and wind farm operators to control maintenance demands and reduce their costs per kilowatt-hour.



# The End

