

## Organisation

### Options of Participation

Participation fee	until Dec 16 <sup>th</sup> , 2018	after Dec 16 <sup>th</sup> , 2018
CWD	810,- €*	940,- €*
CWD + ATK	955,- €*	1110,- €*

### The participation in the conference is free for speakers.

The fee includes conference documents, snacks during breaks, lunch as well as the participation in the CWD dinner. The printed version of the conference transcript can be preordered for a reduced rate of 60 €\* or after the conference at a rate of 120 €. In case of cancellation until two weeks before the conference, a fee of 200 €\* will be charged. For later cancellation or non-attendance, the full participation fee will be charged.

### Discounted participation in the Drive Train Technology Conference (ATK) 2019

For further information please visit:  
[www.atk-aachen.de](http://www.atk-aachen.de)

### Exhibition of related topics

An important part of the event is the exhibition of related topics. The fee for an exhibition space is 500 €. Take the opportunity to demonstrate your contents and products during the exhibition.

### IECRE Meeting WG 003 (Customer Test Facilities) 14.03.2019 Aachen

Following the Conference for Wind Power Drives 2019, the IECRE Meeting WG 003 (Customer Test Facilities) will take place in Aachen on Thursday 14<sup>th</sup> of March.

\* Prices do not include VAT

### Registration

[www.cwd.rwth-aachen.de/conference](http://www.cwd.rwth-aachen.de/conference)

The number of participants is limited. Registration will be processed in order of receipt.

### Venue

Eurogress Aachen  
Monheimsallee 48  
52062 Aachen

### Conference office

Stefan Mager  
Tel.: +49 (0)241/94662-824  
Fax: +49 (0)241/94662-66  
E-Mail: [info-atk-cwd@rwth-aachen.de](mailto:info-atk-cwd@rwth-aachen.de)

### Sponsoring

You have the opportunity to present the logo of your company during the event. For further information please visit:  
[www.cwd.rwth-aachen.de/conference](http://www.cwd.rwth-aachen.de/conference)

### Support

The Mechanical Engineering Industry Association (VDMA), the Research Association for Drive Technology (FVA) and the IEEE Power Electronics Society support the Conference for Wind Power Drives. The CWD is a leading event in wind industry and focused on drive trains of wind turbines.



CWD 2019

CWD 2019

## About us



### Board of Conference

- Automation of Complex Power Systems (ACS)  
Univ.-Prof. Dr. Antonello Monti
- Aerodynamisches Institut (AIA)  
Univ.-Prof. Dr. Wolfgang Schröder
- Chair for Wind Power Drives (CWD)  
Univ.-Prof. Dr. Georg Jacobs
- Institut für Elektrische Maschinen (IEM)  
Univ.-Prof. Dr. habil. Dr. h. c. Kay Hameyer
- Institut für Regelungstechnik (IRT)  
Univ.-Prof. Dr. Dirk Abel
- Power Generation and Storage Systems (PGS)  
Univ.-Prof. Dr. ir. Dr. h. c. Rik W. De Doncker
- Werkzeugmaschinenlabor (WZL)  
Univ.-Prof. Dr. Christian Brecher

### Host

IMSE - RWTH Aachen University  
&  
Center for Wind Power Drives

### Center for Wind Power Drives RWTH Aachen University

The Center for Wind Power Drives combines the research and development efforts on drive trains of wind turbine generators at RWTH Aachen University. The seven research institutes have access to testbenches up to 4 MW to test wind turbine generators.

### Programme Committee

- Jens Demtröder, Vestas Wind Systems A/S
- Dr. Martin Knops, ZF
- Christian Kunze, FVA e.V.
- Carlos Härtel
- Dr. Andreas Klein, Winergy
- Alexander Ribbentrop, Senvion SE
- Dr. Frank Krull, ESM GmbH
- Dr. Lutz Lindemann, Fuchs Petrolub SE
- Joachim Nitzpon, Nordex Energy GmbH
- Prof. Jan Wenske, Fraunhofer IWES
- Prof. Dr. Ralf Schelenz, CWD
- Rudolf Walter, Schaeffler AG
- Dr. Roland Zeichfuß, Siemens AG



## 4<sup>th</sup> Conference for Wind Power Drives

12<sup>th</sup>-13<sup>th</sup> of March 2019

## Programme

### Conference for Wind Power Drives

The latest developments and innovations will be presented at the CWD. We are going to focus on drive trains and pitch and yaw systems of wind turbines.

CWD 2019

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CWD 2019

**Plenary lectures**  
Host: Prof. G. Jacobs, Room: Europasaal

**Plenum 1 (together with ATK)**

08.45 **Welcome and opening words**  
09.00 **Industry 4.0 review - Challenges and opportunities**  
Various industrial companies and MSE, RWTH Aachen  
09.45 **Model Based Systems Engineering for agile product development**  
Prof. Dr. G. Jacobs, MSE, RWTH Aachen

10.15 Coffee break

**Plenum 2**

10.30 **Systems Engineering in the automotive industry**  
Dr. Walter Koch, Schaeffler Technologies AG & Co. KG & N.N.  
11.00 **Wind turbine electrical solutions, balancing sustainable incremental and radical development**  
Dr. Philip C. Kjaer, Vestas Wind Systems

11.30 Lunch

**Gearbox - Torque Density**  
Host: Dr. Andreas Klein - Flender GmbH, Room: 1

**Grid Conformity**  
Host: Dr. Roland Zeichfußl - Siemens AG, Room: 2

13.15 **Requirements for wind turbine gearboxes with increased torque density with special attention to a low-noise turbine operation**  
Dr. Kai Lubenow, Eickhoff Antriebstechnik GmbH

13.15 **Upcoming changes in the role of mechanical loads and power curve type testing within the new IEC-RE type certification and project certification scheme for wind turbines and wind farms.**  
Eric Effern, Windtest Grevenbroich GmbH

13.45 **Case study and measurements - planet carrier misalignment influence on load sharing and distribution**  
Wim Smet, ZF Wind Power Antwerpen

13.45 **Systematic validation of test benches for testing electrical properties of wind turbines**  
Jonas Bielemeier, CWD, RWTH Aachen University

14.15 **Flank fracture analysis of planet wheels in wind gear boxes**  
Jean-André Meis, Siemens AG

14.15 **Comparison of impedance characteristics of multi-megawatt grid simulator with LVRT-container during LVRT test**  
Soroush Azarian, Fraunhofer-Institut für Windenergiesysteme

14.45 **The race of the machines: Torque density boost for wind turbine gearboxes**  
Alfredo Fernandez-Sison, Siemens Gamesa Renewable Energy

14.45 **Simulative analysis of LVRT scenarios within a complete system model of a wind turbine with DFIG**  
Christoph Müller, CWD, RWTH Aachen University

15.15 **Calculation of tooth flank fracture load capacity acc. to the method of Leimann**  
Dirk-Olaf Leimann, ZF Wind Power Antwerpen

15.15 **The impact of the modelling depth of mechanical and electrical sub-models on the simulated electrical properties of wind turbines**  
Abdul Baseer, CWD, RWTH Aachen University

15.45 Coffee break

**Gearbox - System Performance**  
Host: Dr. Martin Knops - ZF Wind Power, Room: 1

**Generator**  
Host: Prof. Kay Hameyer - IEM, Room: 2

16.15 **Special creeping movements of drive train components in wind power gearboxes**  
Dr. Andreas Maiwald, Maiwald Engineering

16.15 **Study of various direct drive wind turbine concepts with respect to air gap sensitivity by means of multibody simulation**  
Abdul Baseer, CWD, RWTH Aachen University

16.45 **Investigations on wear robustness of planet axles in wind turbine gearboxes**  
Dr. Thorsten Fingerle, Alexander Kamps, Winergy

16.45 **Open air-cooled generators for the use in wind turbines**  
Dr. Roland Zeichfußl, Siemens AG

17.15 **Gear Excitation Reduction – One piece of the puzzle towards a tonality free wind turbine**  
Sebastian Schmidt, ZF Wind Power Antwerpen

17.15 **Hybrid electromechanical simulation of a direct-drive generator**  
Considering Parasitic Airgap Forces and External Loads  
Tobias Duda, CWD, RWTH Aachen University

17.45 **High efficiency lubricants for wind turbine gearboxes – Measurements and formulation**  
Hubert Klein, Grégoire Roux, TOTAL M&S

17.45 **Improving power electronics availability for wind: Thermal cycling, temperature control and fault tolerance**  
Udai Shipurkar, TU Delft

19.15

**Dinner at the Aachen City Hall**



**System Testing & Test Benches**  
Host: Jens Demtröder - Vestas, Room: 3

13.15 **On the status of certifying electrical properties of wind turbines on Hardware-in-the-Loop system test benches**  
Uwe Jassmann, CWD, RWTH Aachen University

13.45 **Hardware-in-the-loop framework with emulation of rotor dynamics for electrical certification on a nacelle system test bench**  
Mohsen Neshati, Fraunhofer IWES

14.15 **Drive Train Testing at Lindø Off-shore Renewables Center**  
Jens Lillesø, LORC

14.45 **Application of a test bench to wind turbine drive trains subject to dynamic loads: Learnings and recommendations**  
Philippe Giguere, GE Renewable Energy

15.15 **Integration of commercial wind power plant on system test bench and verification of system services**  
Heiko Röttgers & Steffen Dörnath, WRD Wobben Research and Development GmbH

16.15 **Design and evaluation of a battery-supported electric drive train for kite-based high-altitude wind energy conversion**  
Daniel von den Hoff, PGS, RWTH Aachen University

16.45 **SCD - Super Compact Drive redesigned and successfully tested to meet floating offshore challenges**  
Jan-Christoph Hinrichs, Aerodyn Engineering GmbH

17.15 **Drive train concept with 6 high speed generators and its operational strategy**  
Friederike Barenhorst, CWD, RWTH Aachen University

17.45 **The maxcap wind turbine - comprehensive approach for an optimized drive train and power conversion system**  
Markus Becker, Windwise GmbH

08.00 **Bus transfer to the Center for Wind Power Drives**

09.00 **Institute Tour**  
**With coffee bar and snacks**

10.15 **Bus transfer to the Eurogress**

11.00 **Application of high speed e-machines in automotive industry**  
Theo Gassmann, GKN Driveline International GmbH

11.30 **Coffee break**

**Roller Bearings - Design and Testing**  
Host: Rudolf Walter - Schaeffler AG, Room: 1

**Wind 4.0 - Potential of Data Analytics**  
Host: Dr. Carlos Härtel, Room: 2

**Plain Bearings**  
Host: Dr. Frank Krull - ESM GmbH, Room: 3

11.45 **Investigation of roller sliding in wind turbine gearbox high-speed shaft bearings**  
David Vaes, SKF Belgium NV/SA; Dr. Jonathan Keller, NREL

11.45 **Load duration distribution based on SCADA history**  
Björn Roscher, CWD, RWTH Aachen University

11.45 **Hydrodynamic plain bearings as the main shaft bearing of a 6 MW offshore wind turbine**  
Azadeh Kasiri, CWD, RWTH Aachen University

12.15 **Specific challenges for the design process of pitch slewing bearings and how test benches contribute**  
Jan Fischer, Nordex Energy GmbH

12.15 **Deep learning based failure prediction in wind turbines using SCADA data**  
Stephan Vogt, Fraunhofer IEE

12.15 **Plain bearings for wind turbine gearboxes – designs and bench testing**  
Maarten Ooms, ZF Wind Power Antwerpen

12.45 **Large size testing and the role of sensorized rollers**  
Martin Göbel, SKF GmbH

12.45 **Automatic detection of events critical for drivetrain health and lifetime from long-term field measurements**  
Jan Helsen, Vrije Universiteit Brussel

12.45 **EHL simulations of hydrodynamic bearings in wind turbines**  
Dr. Jochen Lang, IST Ingenieurgesellschaft für Strukturanalyse und Tribologie GmbH

13.15 Snacks

**Roller Bearings - Loads**  
Host: Dr. Lutz Lindemann - Fuchs Petrolub SE, Room: 1

**Wind 4.0 - Predictive Maintenance & Reliability**  
Host: Prof. Jan Wenske - Fraunhofer IWES, Room: 2

**Condition Monitoring**  
Host: Prof. Ralf Schelenz - CWD, Room: 3

14.00 **Comparison between the local loads of the planetary bearing in the 2.75 MW wind turbine planetary stage and component test rig**  
Stefan Kock, CWD, RWTH Aachen University

14.00 **Life time and reliability calculation for wind turbine gearboxes**  
Dr. Andreas Vath, ZF Wind Power Antwerpen

14.00 **Observer-based condition monitoring for drive trains of offshore wind energy converters - Application to a large-scale test at the CWD**  
Andreas Nuber, Wölfel Engineering GmbH + Co. KG

14.30 **Validation of MBS modeling methods to calculate bearing and tooth loads in the planetary gear stage of a wind turbine**  
Daniel Matzke, CWD, RWTH Aachen University

14.30 **Advanced approach for reliability determination of drive train components in the wind energy turbine**  
Dr. Valentin Meimann, MML Solutions GmbH / Managing Partner

14.30 **Increasing forecasting accuracy of an innovative bearing condition monitoring system at the 4 MW system test bench**  
Freia Harzendorf, CWD, RWTH Aachen University

15.00 **Intelligent use of field data benefits from rotor bearing tests**  
Manuel Rettinger, Schaeffler

15.00 **An exploratory analysis on the usability of high frequency wind turbine controller data for predictive maintenance**  
Evan Dwayne Roberts, CWD, RWTH Aachen University

15.00 **Condition monitoring systems for wind power frequency converters**  
Oliver Schönfelder, Woodward Kempen GmbH

15.30 **Bearing currents as WEC-trigger in wind turbines**  
Dr. Jörg Loos, Schaeffler

15.30 **A universal and extensible data model for operational data of wind turbines**  
Michael Pagitsch, CWD, RWTH Aachen University

15.30 **1D-3D Nesting: Embedding reduced finite element models in system-level wind turbine drive train models**  
Jelle Bosmans, KU Leuven Noise & Vibration Research Group, DMMS lab Flanders Make

16:00 **End of the Conference**