Torque Measurement in the MN·m range

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Aerodynamics, control engineering, electrical and mechanical drive technology under a single roof

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Research Advisory Board: Industrial Companies

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Torque Measurement in the MN-m range | Stefan Kock | RWTH Aachen | Successful R&I in Europe Networking Event | 02.03.2017
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Project Website
http://www.ptb.de/emrp/torquemetrology.html

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Motivation:
- MNm torque measurement uncertainty is between 2% and 5%
- No calibration methods for torque above 1 MN·m
- Influence of Multi-Component-Loading is not investigated

Objectives:
- Development of calibration methods for torque above 1 MN·m
- Influence of Multi-Component-Loading on torque measurements
- Development of torque measurements methods up to 20MN·m
## Torque Measurement in the MN·m range
### Consortium

### National Metrological Institutes

- Physikalisch-Technische Bundesanstalt, Germany
- Centro Espanol de Metrologia, Spain
- Cesky Metrologicky Institut Brno, Czech Republic
- Mittatekniikan Keskus, Finland

### Test bench operators

- Chair for Wind Power Drives, Germany
- Fundacion CENER-CIEMAT, Spain
- Fraunhofer Institut für Windenergie und Energiesystemtechnik, Germany
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Overview work packages

1. Inventory
   - Overview of existing nacelle test benches:
     - Characteristics, investigations
     - Used Torque transducer

2. Torque Transfer Standards
   - Development of the torque transfer standards:
     - Calibration of 1MN·m torque transducer
     - Extrapolation methods up to 5MN·m

3. Multi-component Investigations
   - Multicomponent calibration capabilities in MN·m:
     - Inventory
     - FEM modelling under multi-component load

4. Force Lever Systems
   - Design of force lever system to measure torque:
     - From 5MN·m up to 20 MN·m

5. Calibration Procedure
   - Development of calibration procedure for nacell test benches:
     - Realisation on the 4MW test bench
Thank you for your attention!

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