

## NEWSLETTER NO. 2 – SEPTEMBER 2016

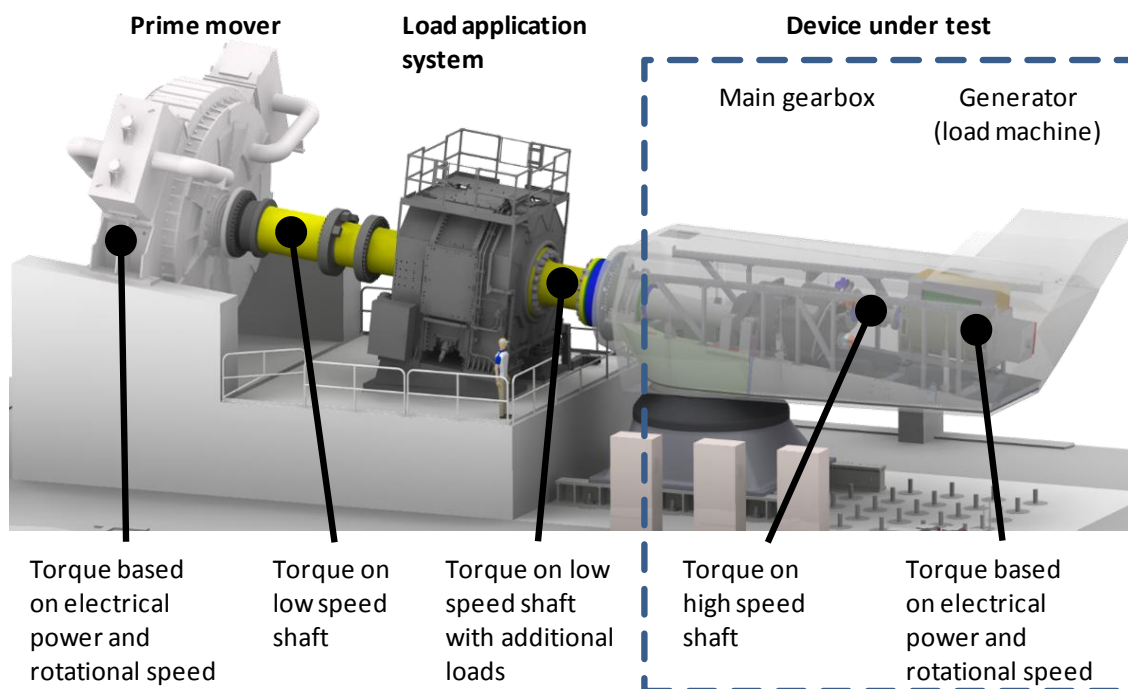
Welcome to the second edition of the newsletter for the EMPIR MN·m Torque project. In this edition, a brief summary of the objectives, activities and the current state of work in the technical work package 1 (WP1 - *Inventory*) is presented.

### PROJECT NEWS

As the first work package (WP1) will be completed soon, we would like to give you an overview of our work. The objective of this part of our project was to gather information on nacelle test benches and torque measurement methods to improve existing methods and strategies as well as to define a torque calibration procedure for nacelle test benches. Furthermore, the results will be used for all other technical work packages WP2 (*Torque Transfer Standards*), WP3 (*Multi-Component Investigations*), WP4 (*Force Lever*

*Systems*) and WP5 (*Calibration Procedure*).

First of all, a summary of torque measurement methods in national metrology institutes (NMIs) and in nacelle test benches was compiled. An overview of the location and type of torque measurement in nacelle test benches is shown in Figure 1. General ideas for improving and ensuring traceability were gathered. Moreover, the boundary conditions in several nacelle test benches were collected. This includes the range of applicable mechanical loads, size of possible devices under test, measurement data acquisition and torque measurement methods. Information was received from the project partners (CENER, CWD RWTH Aachen and Fraunhofer IWES) and also from other international nacelle test bench operators (Catapult ORE, LORC, NREL, Vestas and Clemson).



**FIGURE 1 LOCATION OF TORQUE MEASUREMENT IN NACELLE TEST BENCHES**



In future, proposals for the improvement of the torque measurement methods in nacelle test benches will be made and first ideas for a torque calibration procedure will be gathered.

The other technical work packages are all in a very early stage. In WP2 (*Torque Transfer Standards*) a 5 MN·m torque transducer was calibrated up to 1.1 MN·m at PTB and measurements to establish an extrapolation procedure were carried out at PTB and VTT. In WP3 (*Multi-Component Investigations*) a list with existing multi-component torque transducers was compiled. In WP4 (*Force Lever Systems*) preliminary designs for a torque transducer consisting of force transducers and lever(s) were proposed.

### PROJECT MEETINGS

#### PAST MEETINGS

A project meeting with all involved National Metrology Institutes has taken place at Budva, Montenegro in the framework of the EURAMET TC-M meeting in the beginning of May 2016.

A project meeting for WP1 was held at PTB Braunschweig, Germany, in June 2016. Focus of this meeting was the discussion of the outcome of WP1.

#### FUTURE MEETINGS

A project meeting with open discussion for interested persons will be held alongside the Conference for Wind Power Drives (7-8 March 2017 in Aachen, Germany). More information will be available in due time.

### INVOLVEMENT IN THE PROJECT

We are always looking for further input to our project to complete our overview of the needs and capabilities of the industry. If you are

interested in working with us, please contact us via email or use the short questionnaire on our website to give us an idea of your capabilities in the field of torque measurement.

### HOW TO CONTACT US

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[www.ptb.de/empir/torquemetrology.html](http://www.ptb.de/empir/torquemetrology.html)

### THE CONSORTIUM



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