



September 2017

Details to the IEA Wind Task 32 Workshop #6 on

Power Performance Measurement Using Nacelle Lidars

Date: 27th September 2017

Venue: DONG Energy, Gentofte (5 km North of Copenhagen), Denmark

Workshop leader: Rozenn Wagner (DTU)

Introduction to IEA Wind Task 32

The main objective of the Task 32 is to identify and mitigate barriers to the use of lidar technology in wind energy applications such as site assessment, power performance, loads & control, and complex flow. One yearly workshop is organized for each of the four applications focusing on one specific problem, and with a well-defined program and tangible outcome.

More details can be found on the [task website](#).

Objective

The workshop will focus on following questions:

- How can nacelle lidar systems be calibrated and used for power curve measurements?
- What are the current limitations and approaches to solve them?
- What would help the different stakeholders to fasten the process?

The outcome of the workshop will be a “state-of-the-art” report which will be used as input for the concurrent new IEC standard on this topic (IEC 61400-50-3: Use of nacelle mounted lidars for wind measurements) and future application of nacelle lidars for power curve measurements.

Concept

The workshop is split in two main sessions:

1. In the morning we will have invited presentations and discussions about **nacelle lidar calibration and measurement uncertainty estimation**.
2. In the afternoon we will have invited presentations and discussions about **nacelle lidar applied to power curve measurement**.

Expected Outcome

The outcome of this workshop will be collected in a short report and will be presented as input to the IEC61400-50-3 kick-off meeting, scheduled on the 4-6th of October 2017.

Expected Participants

All kinds of stakeholders –lidar and turbine manufacturers, consultants, academics, end users dealing with power performance testing using nacelle mounted lidars.

Practical Arrangements

Venue Information

The workshop will be held in room Auditorium F0.1a at DONG Energy, Nesa Allé 1, 2820 Gentofte, Denmark. **Register in the reception, when you arrive.**



Public transportation time schedules

www.Rejseplanen.dk

Bus

150 S Nørreport - Kokkedal. Stops at Brogårdsvej / Lyngbyvej. 5 mins. time to Hagedornsvej 4.

169 Lyngby - Hellerup. Stops at Jægersborg station. 15 min. walk to Nesa Alle.

176 Emdrup Square - Gentofte st. Stops at Egebjerg nursing homes. 2 min. walk to Hagedornsvej 4.

179 Hellerup - Lyngby. Stops at Jægersborg station. 15 min. Walk to Nesa Alle.

184 Nørreport. - Holte st. Stops at Brogårdsvej / Lyngbyvej and on Lyngbyvej opposite DONG Energy.

196 Lyngby st. - Hellerup st. Stops at Egebjerg nursing homes.

S train

S train line E goes to Gentofte and Jægersborg st. Walk along Ørnegårdsvej and use the highway underpass to get to DONG Energy.

Car

Helsingør motorway exit 5, both in south and northbound direction.

Motorring 3 northbound exit 18th

Contact Information

Please contact [Rozenn Wagner](#) (workshop leader) or [David Schlipf](#) (IEA Wind Task 32 Operating Agent) with any questions you may have about the workshop.

Program

8:45	Registration
9:00	Introduction <ul style="list-style-type: none"> Welcome to DONG Energy – Nicolai G. Nygaard – DONG Energy Purpose of the workshop and agenda – Rozenn Wagner – DTU Wind Energy Presentation round
9:30 to 12:00	Nacelle lidar calibration & measurement uncertainty estimation
9:30	Presentations <ul style="list-style-type: none"> Nacelle lidar calibration - best practice at DTU Wind Energy (Antoine Borraccino) Nacelle lidar calibration - best practice at DNV-GL (Jens Riechert) Nacelle lidar calibration - best practice at ECN (Jan Willem Wagenaar) Nacelle lidar calibration - best practice at COWI (Flemming Langhans) Calibration of lidar with a flywheel (TrueWind project) (Mike Courtney - DTU)
10:45	Break
11:00	Group discussions <ul style="list-style-type: none"> Systems that have been calibrated and/or have a procedure Common practices and differences in nacelle lidar calibration what are the main barriers in nacelle lidar calibration identified by the industry? What (critical) points need to be addressed in a standard (e.g. IEC -50-3)? What are the proposed solutions?
11:45	Groups discussions conclusions Presentation of posters and short plenum discussion
12:15	Lunch Break
13:15 – 16:15	Nacelle lidar applied to power curve measurement
13:15	Presentations <ul style="list-style-type: none"> Perspective from a turbine manufacturer (Ioannis Antoniou - Siemens) Perspective from a wind farm developer (Nicolai G. Nygaard - DONG Energy) Measurement in induction zone - the “UniTTe” approach (A. Borraccino - DTU) Measurement in induction zone (Samuel Davoust - GE) Nacelle lidar on a floating turbine (Bruno Declercq – Engie Lab)
14:15	Break
14:30	Presentations <ul style="list-style-type: none"> Offshore power curve measurement using lidars - Carbon Trust project - Results from the nacelle lidars (Peter Clive - WoodGroup) Challenges when using nacelle lidars for power curve measurements (Chris Slinger - ZephIR) Challenges when using nacelle lidars for power curve measurements (Shumpei Kameyama - Mitsubishi Electric) Challenges when using nacelle lidars for power curve measurements (Paul Mazoyer - Avent)
15:30	Group discussions <ul style="list-style-type: none"> What are the main barriers in using nacelle lidars for power performance measurements? What (critical) points need to be addressed in a standard (e.g. IEC -50-3)? What are the proposed solutions?
16:15	Groups discussions conclusions Presentation of posters and short plenum discussion
16:45	Conclusion of the day
17:00	End of Workshop
18:30	Dinner in Copenhagen

Participant List

Name	Country	Institution
Adrian How	UK	SSE
Antoine Borraccino	Denmark	DTU Wind Energy
Beatriz Cañadillas	Germany	DEWI
Bernd Meyerer	Germany	Opticsense
Bruno Declercq	Belgium	Engie Lab
Chris Slinger	UK	ZephIR Lidar
Christophe Lepaysan	France	Epsiline
Christos Tsouknidas	Denmark	Siemens
David Schlipf	Germany	SWE University Stuttgart
Detlef Stein	Germany	Multiversum
Dominique Philipp Held	Denmark	Windar Photonics
Eloise Burnett	UK	Carbon Trust
Flemming Langhans	Denmark	COWI
Guillermo González Rilova	Denmark	Windar photonics
Ioannis Antoniou	Denmark	Siemens
Jan Willem Wagenaar	Netherlands	ECN
Jens Riechert	Germany	DNV GL
Joerg Wanink	Germany	GE
Jørgen Korsgaard Jensen	Denmark	Windar Photonics
Julian Hieronimus	Germany	M.O.E. GmbH
Justin Burstein	Germany	EON
Matthias Ihlenfeldt	Germany	Senvion
Mike Courtney	Denmark	DTU Wind Energy
Nicolai Gayle Nygaard	Denmark	DONG Energy
Nikolai Hille	Germany	DNV GL
Paul Mazoyer	France	Leosphere
Paula Gomez Arranz	Denmark	DTU Wind Energy
Peter Clive	UK	SgurrEnergy
Rainer Reuter	Germany	University of Oldenburg
Rozenn Wagner	Denmark	DTU Wind Energy
Samuel Davoust	Germany	GE Global Research
Shumpei Kameyama	Japan	Mitsubishi Electric Corporation
Stefan Goossens	Netherlands	Vattenfall
Theodore Holtom	UK	Wind Farm Analytics