Crédit Photo: Accurasea

ENERGY

FLOATING LIDAR STAGE 2 TYPE VALIDATION

DNV GL TYPE VALIDATION OF THE ACCURASEA FLOATING LIDAR

DNV GL has successfully completed an independent validation assessment of the Accurasea floating LiDAR offshore wind measurement device requested by EOLFI[1]. The Accurasea floating LiDAR has now formally reached the pre-commercial maturity stage (Stage 2) on the Carbon Trust Offshore Wind Accelerator Roadmap for the Commercial Acceptance of Floating LiDAR Technology[2]. This new system can therefore be used commercially for the assessment of the wind resource of offshore wind farm projects with consideration of the use cases outlined in the CT OWA Roadmap, which will help EOLFI to further develop its commercial activity.

The validation of the device took place at the offshore NAREC Offshore Anemometry Hub (NOAH) in the United Kingdom territorial waters, where the device encountered a wide range of harsh wind and sea conditions over the period from January 2019 to July 2019. The NOAH platform operated by ORE Catapult consists of a 103 m MSL met mast and is considered as a trusted and suitable reference for the trial campaign. Two datasets have been tested for the Accurasea Floating LiDAR one using the Windcube V2 own inertial unit,

and a second one using an external Ekinox inertial unit. For both datasets, the floating LiDAR unit achieved an overall system availability of 100% and an overall post-processed data availability from 95.9% to 99,0% at the 52m, 69 m, 86 m and 103 m MSL configured heights, and recorded wind speed data with an accuracy in line with the best practice acceptance criteria defined in the CT OWA Roadmap, and wind direction data with an accuracy in line with the best acceptance criteria at a key locations (86 and 103m MSL).

[1] DNV GL, "Validation of the Accurasea n°1 Floating LiDAR at the Offshore Meteorological Mast NOAH by Blyth, UK", Ref. L2C151364-FRPR-R-01, Rev. B, 26 September 2019
[2] Carbon Trust, "Offshore Wind Accelerator Roadmap for the Commercial Acceptance of Floating LiDAR Technology", Version 2.0, October 2018

At these heights, results showed that, according to IEC 61400-12-1 Ed.2 standard, the verification uncertainty levels of the unit are comprised between 1.6% and 4.1% for wind speed bins from 4 m/s to 16 m/s.

For wind farm developers that will use the Accurasea system, these are important indicators to obtain an accurate estimation of the wind resource at a potential offshore wind farm site, reduce the project uncertainty, and achieve better financial conditions for the realisation of the project. Ultimately, this contributes to reduce the levelized cost of energy which is a key driver to help the offshore wind industry to move forward.

Floating LiDAR technology uses buoy-mounted laser-anemometry to measure wind speeds, helping to determine the energy production of future offshore wind farms. In recent years, it has become an attractive alternative to conventional meteorological masts which can be more capital-intensive and difficult to install offshore.

DNV GL recently lead a consortium to update the Carbon Trust Offshore Wind Accelerator Roadmap for the Commercial Acceptance of Floating LiDAR Technology. DNV GL continues to support floating LiDAR system manufacturers and offshore wind developers alike, performing unit and type validations as well as classification trials to allow manufacturers build a body of evidence towards achieving the commercial maturity stage (Stage 3) as outlined in the CT OWA Roadmap.
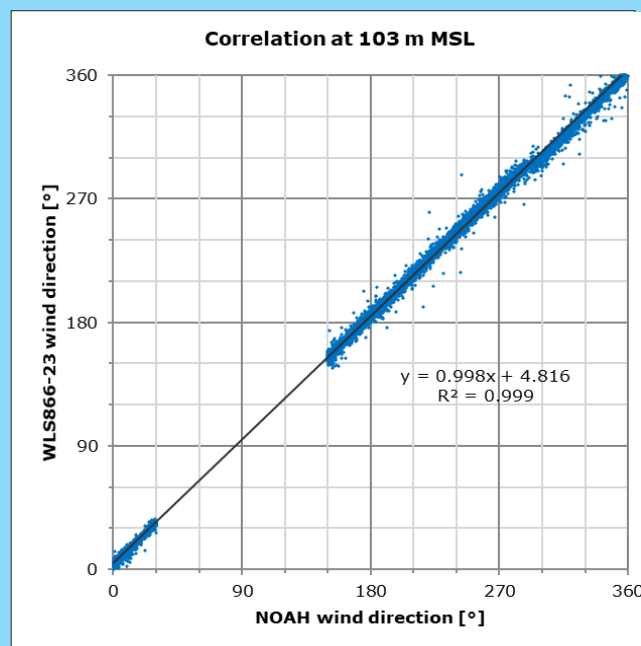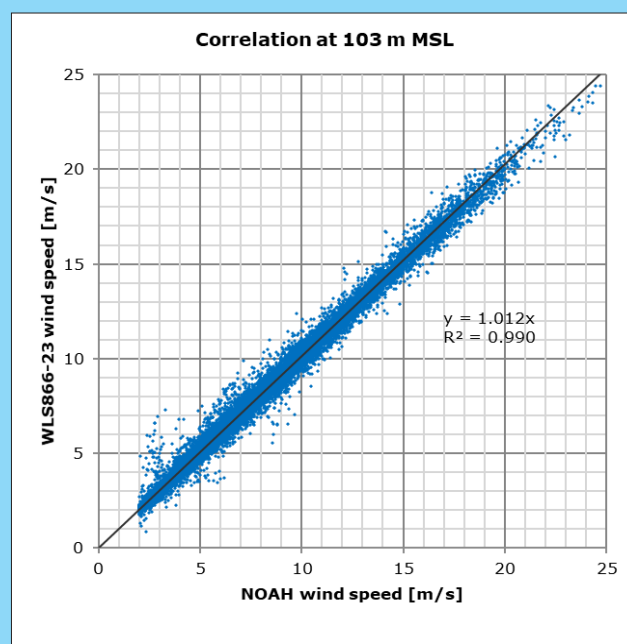
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Correlation at 103 m MSL

$y = 1.012x$
$R^2 = 0.990$

Correlation at 103 m MSL

$y = 0.998x + 4.816$
$R^2 = 0.999$