A case study: Requirements and considerations for the selection of a FLS installation-location in a commercial offshore wind farm project.

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Summary

This case study provides insights into the deployment of a Floating Lidar System (FLS) for a commercial offshore wind project and the faced problems during installation which required the identification of an alternative installation location. Both, technical FLS related issues but also project specific aspects needed to be considered to ensure that the new installation location fulfils the requirements to enable safe, precise, high-availability and interference free measurements. Although some problems and corresponding measures are project specific, the case study provides a general procedure on how to continue when changed conditions or unforeseeable problems are experienced.

1. Introduction & Background

Floating Lidar Systems (FLS) have emerged as wind resource assessment tools for the development of offshore wind farms with the potential to replace meteorological masts for the collection of primary onsite wind data – wind speed and direction. Different initiatives are underway to support the further maturation of Floating Lidar technology and to standardise the deployment of a FLS to obtain the best possible site-specific data quality for a Wind Resource Assessment (WRA) [1][2][3][4][5]. Although the available Recommended Practices provide good guidance on many aspects relevant to formal WRAs, there are aspects which require further elaboration, especially as offshore wind is fast becoming a global industry expanding into sites with more challenging hydrographic and atmospheric conditions. Currently, the Recommended Practices provide limited guidance on identification of a suitable site-specific installation location for a FLS to enable accurate interference-free measurements with high data availability. The competing HSE, consenting, technical, commercial and installation vessel specific considerations constitute the complex and coupled optimising and constraining factors, which need to be addressed and considered to find a suitable deployment position.

2. The case study

The case study is based on a FLS deployment campaign for a commercial floating offshore wind project in Scottish waters.

On-site, changed conditions have been experienced with a guard buoy trawled from its original position into the target installation area. Installation of the FLS at the planned location was not possible.

Technical FLS related issues and project specific constraints needed to be considered to ensure that the new installation location fulfils the requirements to enable safe, precise, high-availability and interference free measurements.

The case study showcases some of the problems that can be faced during installation that demands immediate assessment and intervention. It demonstrates that there is an underlying rational for finding an alternative installation location in real time, and exhibits the questions and considerations that need to be taken into account. We believe that this can be developed into a general heuristic algorithm on how to proceed when changed conditions or unforeseeable problems are experienced during installation. Continuative a recommended standard method what one should respect to identify a suitable installation site for a FLS could be evolve.

3. References

[1] IEA Wind expert group report on recommended practices.
[2] OWA roadmap for the commercial acceptance of floating LIDAR technology.
[3] IEA Wind TCP Annex 32 Work Package 1.5, "State-of-the-Art Report: Recommended Practices for Floating Lidar Systems". Issue 1.0, 2 February 2016.

[4] Offshore Wind Accelerator, Recommended Practices for Floating Lidar Systems, Issue 1.0, 25 October 2016
[5] IEC 61400-15, Assessment of wind resource, energy yield and site suitability input conditions for wind power plants.