

Sunghun Hong



Title:

Global dynamic analysis of on-site offshore installation of floating offshore wind turbines

Research topics:

With increasing global demand for clean energy resources, floating offshore wind energy has been considered one of the main alternatives to fossil-based resources. Towing assembled wind turbine and floating foundation units from the quay to the operation site is currently the primary installation method for floating offshore wind turbines. 'On-site offshore installation' was proposed as an alternative method for geographical challenges that required deep water depth. The main goal of the PhD program is the global dynamic analysis of offshore installation of floating offshore wind turbines with the specific scopes as follows:

- Numerical modelling and global dynamic analysis of the multibody system (floating installation vessel, lifted offshore wind turbine, and floating foundation) during the offshore heavy lifting operation.
- Development of coupling methods to mitigate the relative motion between the lifted wind turbine and the floating foundation for mating preparation.
- Suggesting limiting criteria and guidelines for estimating the operable weather window.

Industrial goals:

- Reduce the cost of installing floating offshore wind turbines using new methods.
- Increase operational efficiency by establishing appropriate limiting criteria and guidelines for the weather window estimation.

Scientific questions:

- What are the critical responses in the on-site offshore installation of floating offshore wind turbines?
- What are the mitigation measures to reduce the global dynamic responses of the multibody system?
- What are the thresholds and limiting criteria for weather window estimates for floating offshore wind turbines installation?

Innovations:

- Methods for the on-site offshore installation of floating offshore wind turbines.

Supervisor:

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