

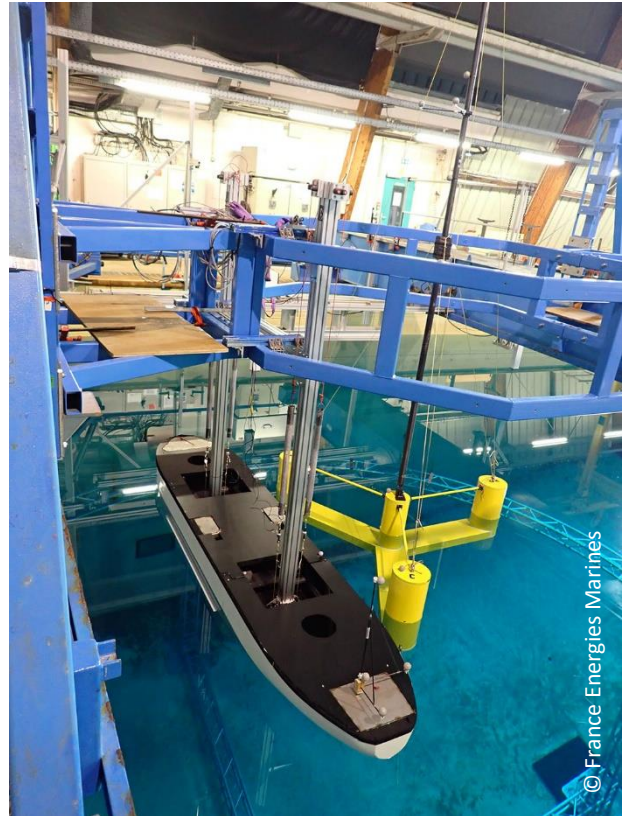
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Wave tank trials to improve the reliability of an offshore maintenance solution for floating wind turbines

Heavy maintenance at sea: a research challenge for the floating offshore wind sector

The future commercial floating wind farms will be far from the coast, and it seems necessary to develop reliable solutions for heavy maintenance operations at sea, such as replacing a major component of the rotor-nacelle assembly. Indeed, for economic and technical reasons, it is not feasible to bring the wind turbines back to the port. One of the difficulties with heavy maintenance operations at sea is the depth of water at the sites targeted, which exceeds the capacity of the self-elevating platforms currently in use. It is therefore necessary to develop solutions adapted to floating supports and to meet the challenges of heavy lifting at height with increasing size of turbines. This is the aim of

a multi-partner research project called FLOWTOM, which was launched in 2021 to help develop solutions adapted to this particular context. Since September 2022, the FLOWTOM partners have been cooperating with WindSpider company to assess their solution for offshore maintenance on 2 different floater types.



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Wave tank trials to validate the numerical approach

A maintenance vessel and a 15 MW wind turbine, either mounted on a semi-submersible floater or a tension leg platform, have been digitally modelled by EDF, France Energies Marines and SBM Offshore to define the operating conditions for heavy lifting at sea, both from the vessel and the lifts system. To improve the reliability of the results obtained from this modelling, tests have been carried out in the wave tank of the Ifremer Centre in Brittany from 8 to 16 April 2024. Using 1:50 scale models, the relative movement of the wind turbine and the vessel have been studied as a function of the significant height (H_s), the period (T_p) and the direction of the swell. The data acquired during the trials will be used to produce a digital twin representing what is happening in the wave tank, which in turn will be used to calibrate the global model. This will reduce the margin of error in the modelling results and make the associated recommendations more reliable.

FLOWTOM project in a nutshell



in cooperation with



WINDSPIDER

⇒ See [project web page](#)

Duration: 36 months (2021-2024) | **Budget:** €1,600K

Press Contacts

- France Energies Marines: Mélusine Gaillard - melusine.gaillard@ite-fem.org - T. +33 (0)2 98 49 98 27
- Ifremer: Julie Danet - presse@ifremer.fr - T. +33 (0)6 07 84 37 97

france-energies-marines.org

