INGEOCEAN

THE TOOL FOR YOUR NEXT CHALLENGES

Offshore wind is one of the most promising energy generation sectors for the next decades, and **Floating Offshore wind** is understood as the next paradigm in this sector. Floating Offshore will not only make wind turbines available in locations with excellent wind resources but also it will help to untap new markets without geomorphological restrictions: deep and very waters.

One of the key aspects on the roadmap towards a mature Floating Offshore market is to help and support this technology to decrease their costs. Our tool, **IngeOcean is a system helping asset owners to optimize OPEX, and therefore, LCOE.**

Floating Offshore Wind Turbines require a complex access and deployment. In comparison to Offshore Wind Turbines, where the support structure's anchored to the seabed, in Floating Offshore both Wind Turbine and platform are moving within the sea conditions, making more challenging the accessibility from the boat to the turbine, as well as the workability on board of the structure.

During the Feasibility Phase, project developers do require to decrease the uncertainty of their O&M assumptions in terms of ensuring an realistic wind farm operating conditions.

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Ingeteam

■ Floating Offshore Support

Our tool enables to **reduce uncertainties** related to randomess of ocean conditions and failure mechanisms and **predict energy production variability** thanks to a validated methodology which incluides advanced numerical models and a solid statistical approach based on our deep knowledge on wind farms operation.

Usually, O&M KPIs evaluation are based on the definition of safety thresholds associated to specific meteocean parameters (Wave height, Wind intensity, etc.). The risk associated to personnel and assets, during any kind of marine operation in a offshore wind farm, is strongly dependent on a complex phenomenon induced by the fluid–vessel–structure interaction. Here is where IngeOcean makes the difference. It provides a flexible framework/solution that combines long-term metocean data bases and the simulation of the marine operations involved in minor, medium and large O&M activities, including sea transportation or accessibility issues, as well as workability limitations due to the dynamic response of the floating platforms.

A unique **robust and detailed** catalogue of wind turbine fails (+1800 types of events parametrized) and **multiple KPIs** derived from our experience operating wind farms worldwide (i.e. wind farm availability, weather windows, waiting time to access, MTTR, MTBF) lead to an **advanced tool capable to** help utilities, operators and consultancy companies, in the O&M strategy definition by providing the key information needed, from a multi-scenario analysis, on the decision making process towards optimized offshore farms.

Ingeteam and **IH Cantabria** have jointly developed a tool aiming to support Floating Offshore Developers during the project development phase.

Based on High resolution and validated metocean databases, a complete wind farm model is built including advanced algorithms to predict transportation, personnel transfer and marine operations required during O&M activities during the life span of the asset.

SITE METE-OCEANIC DATA

O&M CHARACTE-RIZATION

DYMANIC MODELLING