

# MOSISS

## Monitoring strategies for innovative substations

DURATION: 24 months | LAUNCH: 2020 | Total budget: €892K

### CONTEXT

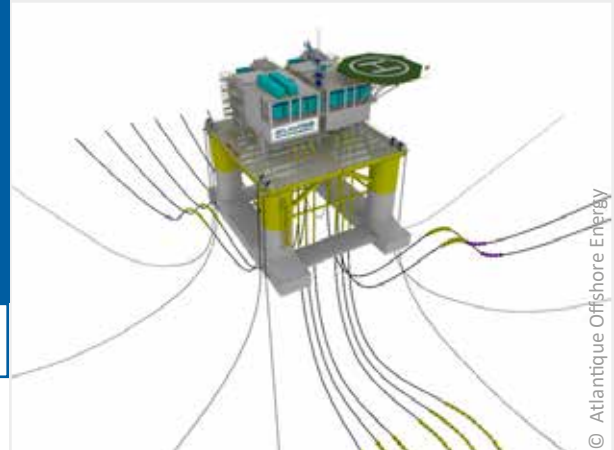
Worldwide, floating offshore wind farms are seen as one of the best candidates for reaching the renewable energy targets by getting a better resource farther offshore, with more intense and stable winds, and limiting interaction with other activities, thus improving acceptability. The offshore electrical substations of the first commercial farms in France will be installed on piles, although the depths will be greater than for conventional bottom-fixed farms. The next calls for tender will be farther offshore and therefore will be economically not viable with bottom-fixed technologies. **So it is critical in the near future to accelerate the development of offshore substations, in particular with in-service health monitoring of the electrical and structural components (including mooring) in order to optimise the costs associated with the operation and maintenance phases.**

### OBJECTIVES

To develop and demonstrate a comprehensive methodology for in-service electrical and structural health monitoring (including mooring) of floating offshore substations with currently available solutions and identify challenges for future technologies.

### EXPECTED RESULTS

- **Risk analysis methodology** for floating offshore substations at system level
- **Definition of physical parameters** that can or could be monitored with existing sensor solution or sensor to be developed
- **State-of-the-art of sensors** for such failures and risks detection, with a focus on ability to update system state with limited false alarms and miss detections
- **Definition of a global methodology** for operation and maintenance strategies based on in-service electrical and structural health monitoring (combination of inspection and monitoring)
- **Demonstration of the methodology** at the system level, based on case studies with several scenarios, computation of the value of information (VoI)
- **Specification of target values** for the mean time to failures of new and existing components in a new environment (GIS, transformers, auxiliaries) to meet the availability initially set



© Atlantique Offshore Energy

### TECHNOLOGIES



### STAGES OF THE VALUE CHAIN



Preparatory studies



Design



Manufacturing



O&M

### SCIENTIFIC CONTENT

- **Return of experience synthesis** and definition of specific needs related to floating offshore substations
- **Development of a maintenance optimisation approach:** identification of the risks for floating offshore substations, identification of degradation processes and development of simplified models, definition of the system reliability accounting for in-service electrical and structural health monitoring
- **Specification of the in-service electrical and structural health monitoring:** performance, redundancy

### PARTNERS



With the financial support of EDF Renewables and Région Pays de la Loire.



This project receives French State funding of €239K managed by the National Research Agency under the Investments for the Future Programme.



france-energies-marines.org

