Japan Marine United Corporation

Oct. 8, 2024

JMU starts the Phase 2 of Floating Offshore Wind Demonstration Project granted by NEDO GI Fund

Japan Marine United Co., Ltd. ("JMU") officially started **"The Southern Akita Floating Offshore Demonstration Project Aimed at Overseas Expansion via Cost Reductions"** ("The Project").

The project has been selected as the Phase 2 of the Green Innovation Fund (*1) "Cost Reductions for Offshore Wind Power Generation" project granted by the New Energy and Industrial Technology Development Organization (NEDO).

The consortium consisting of nine companies (*2) led by Marubeni Offshore Wind Development Corporation will work on the project to install two WTGs with a capacity of over 15MW each, approximately 25km off the coast of southern Akita Prefecture, in water depth of approximately 400 m. The project period is from August 2024 to March 2031, and the demonstrative windfarm will start operation around the autumn of 2029.

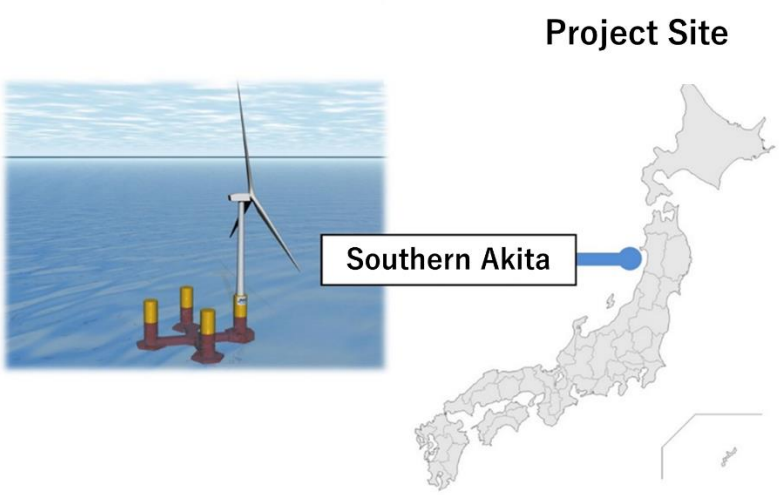


Image of the project

During the Phase 1 of the GI Fund from FY2021 to FY2023, JMU has conducted R&D for reducing the cost of fabrication and installation of floating substructures using state-of-the-arts semi-submersible floating substructure design developed by JMU, and obtained the knowledge and technology in the full range of EPCI business of offshore floating windfarm project.

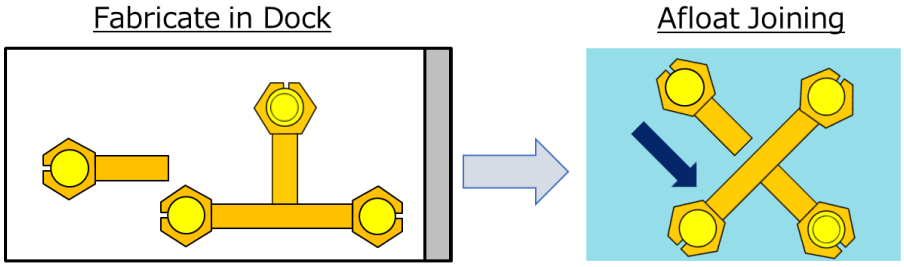
In this project, JMU will conduct R&D on the following seven themes to solve further technical challenges for the social implementation of floating offshore wind by utilizing knowledge in the Phase 1.

R&D Themes

<EPCI>

Establishment of afloat joining technology at the sea which enables enhanced mass production of floating substructures:

As WTGs become larger, floating substructures also become larger, and the options for construction facilities which enable to build whole floater in one piece are very limited. JMU will establish afloat joining at the sea technology at the sea by joining split-building blocks of the floating substructure, which enables optimal mass production of floating substructures.



[Image of afloat joining technology]

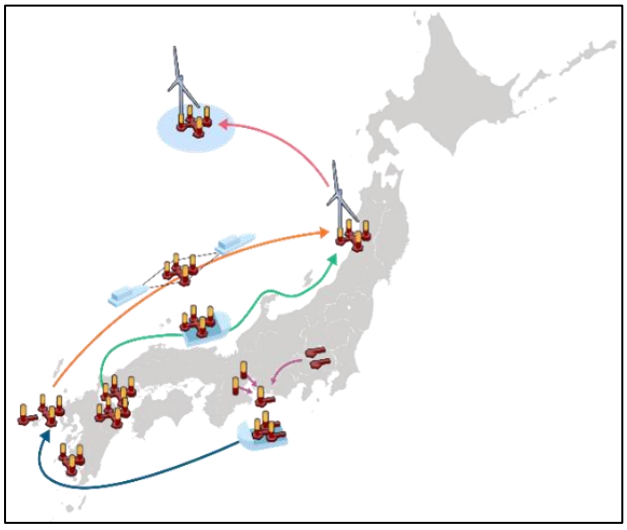
Establishment of optimal construction methods by building the alliance:

JMU's floating substructure design is simple and can be easily fabricated by yards that deal with steel structures such as ship and bridges. Through building alliance with those yards, JMU will establish optimal construction method by gathering hull blocks, fabricated concurrently in separate yards, to one place and joining at the sea.

Improvement of floating substructures transportation by minimizing temporary wet storage:

By establishing mass production system of floating substructures, many floaters will be transported to the integration port of WTGs at once. On the other hand, integration work of WTGs is sensitive to weather condition and downtime would potentially occur due to severe weather. Then many floating substructures need to be wet stored prior to integration of WTGs. However, it is not easy to secure enough sheltered waters for temporary wet storage of many floaters.

JMU will develop optimized transportation method of many floaters to the integration port as well as preparatory work cycle before/after integration of WTGs in order to minimize cost related to such downtime.



[Image of optimal construction method and floating substructure transportation]

Improvement of availability of Work Vessels and CTVs:

Downtime due to severe weather lowers window of offshore construction activities.
Further improvement of construction efficiency of mooring installation is required in the future commercial-scale projects. During O&M phase, improving access rate of CTVs to the floaters is also required.

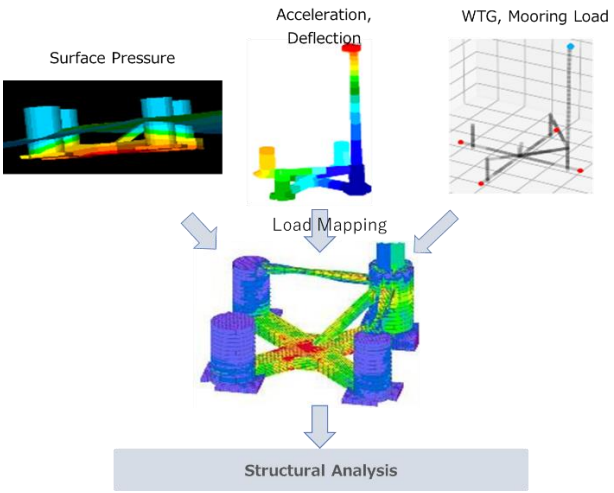
JMU will develop efficient installation method as well as high-accurate assessment of accessibility technologies which improve availability of work vessels and CTVs.

[Work Vessel for Offshore construction (AHTSV*3　Offshore Operation Co, “Akatsuki”)]

Establishment and standardization of high-precision structural analysis methods for large floating substructures:

As WTG become larger, the natural frequency of the floating substructure and the WTG tend to interfere with each other. Conventional design methods are not sufficient to fully analyze the effects of wind loads to avoid the interference.

JMU will establish a highly accurate structural analysis methods to optimize the reliability and cost of floating substructures.

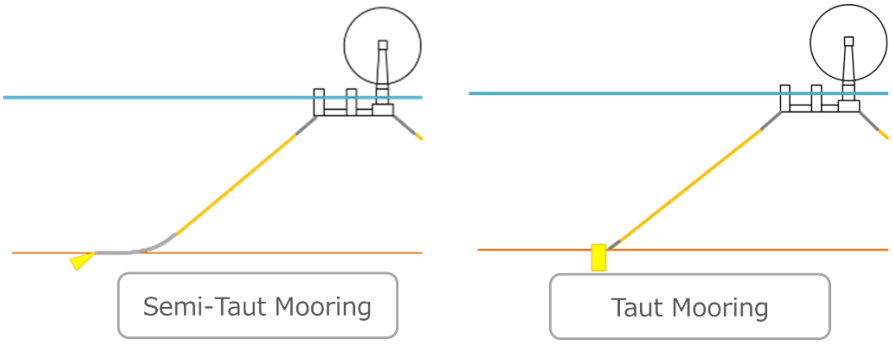


[Image of Structural Analysis Method]

Overall cost optimization of hybrid mooring in deepwater areas:

During the Phase 1 of the GI Fund, JMU proved cost advantages of taut/semi-taut hybrid mooring system consist of fiber ropes and steel chain over chain catenary mooring system.

JMU will develop design system of taut/semi-taut hybrid mooring to optimize total cost including procurement and installation in deepwater areas.



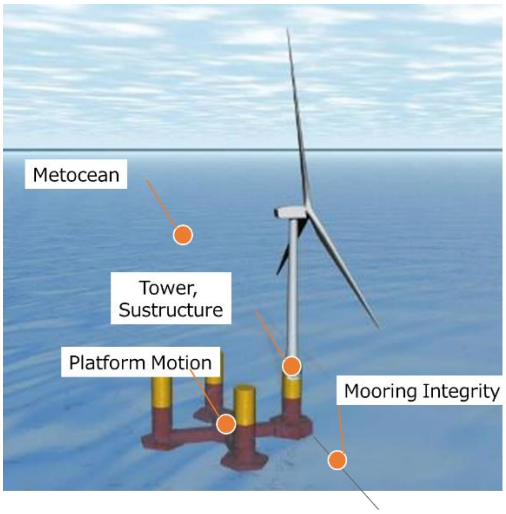
[Image of mooring system]

<O&M>

Improvement of the project asset value i.e., power production and lifetime, by utilizing Digital Twin system:

It is important to predict failures in advance and maintain soundness of FOWTs since it is not easy to daily access them located far offshore.

JMU will establish O&M method of FOWTs which can monitor structural soundness from the onshore bases by utilizing Digital Twin system to improve the project asset value such as power production and lifetime.



[Digital twin Monitoring target]

Through the above R&D activities, JMU will contribute to develop highly reliable and low-cost commercial-scale wind farms by optimizing workability in the full range of EPCI business.

JMU will work together with the consortium to contribute to the realization of carbon neutrality by reducing the cost of floating offshore wind and expanding its implementation. In addition, JMU will use the knowledge gained through this project to expand our business to all over the world and aim to provide Japanese technologies and standards.

*1 Green Innovation Fund Project:

A fund established by NEDO to provide continuous support for companies committed to ambitious targets for the realization of carbon neutrality by 2050 for up to 10 years, from R&D and demonstration to social implementation.

*2 Consortium members:

Marubeni Offshore Wind Development Corporation (managing company)
Tohoku Electric Power Co., Inc.
Akita Floating Offshore Wind LLC
Japan Marine United Corporation
TOA CORPORATION
TOKYO SEIKO ROPE MFG. CO., LTD.
Kanden Plant Corporation
JFE Engineering Corporation
NAKANIHON AIR Co., Ltd.

*3 AHTSV:

Anchor Handling Tag Supply Vessel