
Neubrex to Develop Fiber Optic Monitoring Technology for Offshore Wind Turbine Mooring Systems

—Participating in NEDO's Demonstration Research Project for Next-Generation Floating Offshore Wind Power Generation Systems—

Neubrex Co., Ltd. (Kobe, Japan; President: Kinzo Kishida) will participate as a subcontractor in the R&D theme “Research and Development of Long-Term Monitoring and Integrity Assessment Technologies for Mooring Systems Using Highly Corrosion-Resistant Steel Cables with Fiber Optic Sensing,” which has been selected by the New Energy and Industrial Technology Development Organization (NEDO), with KOBELCO WIRE COMPANY, LTD. (Hyogo, Japan; President: Shuji Kitayama) serving as the lead implementing organization.

Japan has positioned renewable energy as a major power source and is promoting reductions in greenhouse gas emissions and enhanced energy security through its expanded deployment. Offshore wind power, in particular, is regarded as an important source of electricity with the potential for both large-scale deployment and cost reductions. Floating offshore wind power has especially significant future deployment potential given the water depths and oceanographic conditions surrounding Japan. At the same time, challenges remain, including adaptation to severe meteorological and oceanographic conditions, reductions in installation, construction, operation, and maintenance costs, and ensuring safety and reliability.

This R&D project will develop a mooring system for floating offshore wind power generation using steel cables with a proven track record of long-term use in bridges and other structures. For mooring systems used in floating offshore wind power generation, the project aims to reduce costs, including O&M costs, secure the supply capacity required for large-scale deployment, and enhance adaptability to a wide range of water depths and environmental conditions.

Specifically, the project will verify the feasibility and effectiveness of a mooring system design concept using highly corrosion-resistant steel cables, while also developing fiber optic sensing-based mooring monitoring technology and integrity assessment methods. Through these efforts, the project aims to enhance maintenance practices and reduce O&M costs for mooring systems using steel cables.

Through this R&D project, we will establish a technological foundation that contributes to improved safety and reliability of mooring systems, more advanced maintenance, and lower O&M costs, thereby supporting the expanded deployment of floating offshore wind power generation.

Project Overview

Item	Details
Program Administrator	New Energy and Industrial Technology Development Organization (NEDO)
Project Name	Technology Research and Development for Wind Power Generation, etc. / Technology Research and Development for Offshore Wind Power Generation, etc. / Demonstration Research on Next-Generation Floating Offshore Wind Power Generation Systems (Development of Next-Generation Technologies Contributing to the Promotion of Floating Offshore Wind Power Generation)
R&D Theme	Research and Development of Long-Term Monitoring and Integrity Assessment Technologies for Mooring Systems Using Highly Corrosion-Resistant Steel Cables with Fiber Optic Sensing

Implementation Structure	Lead implementing organization: KOBELCO WIRE COMPANY, LTD. Co-implementing organization: The University of Osaka; Subcontractor: Neubrex Co., Ltd.
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Project Features and Concept

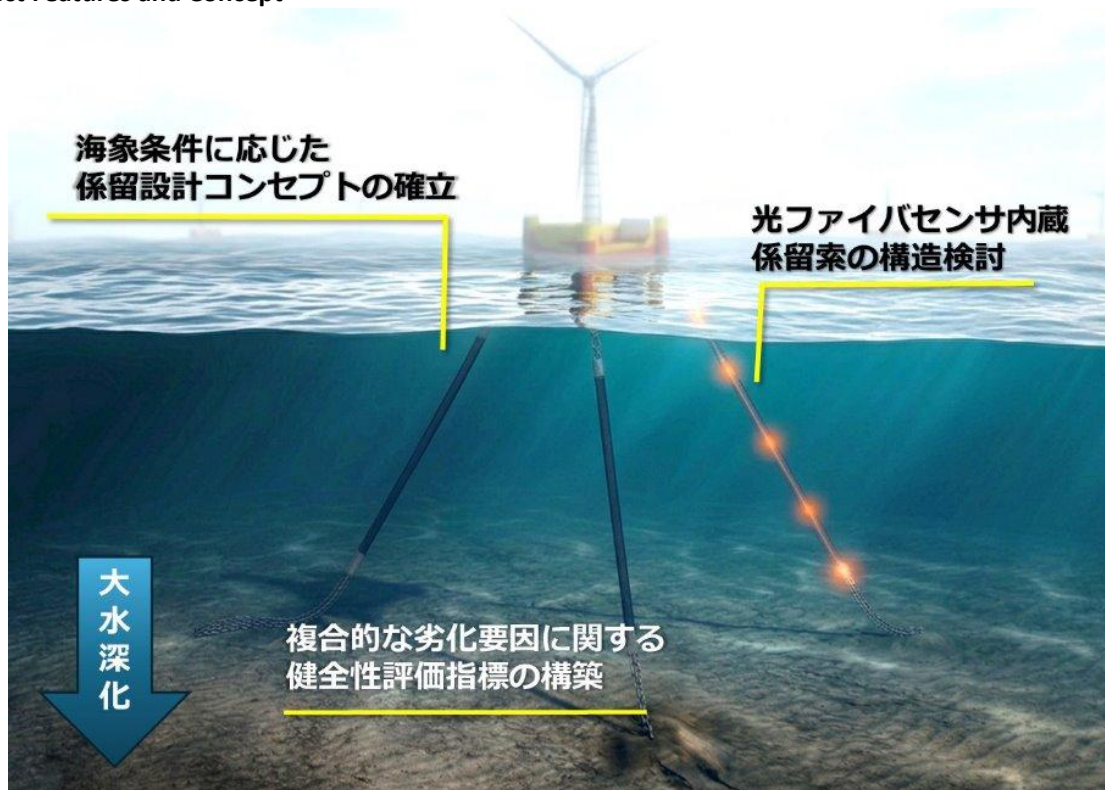


Figure 1 Mooring design using steel cables with sensing functionality (conceptual image)

高耐食型鋼製ケーブル（高耐食型SPWC）の信頼性と優れた特性を活用し、大水深・過酷海域における多様な海象条件に対する係留課題の解決に貢献

日本特有

大水深・厳しい
海象条件への対応

新規性

光ファイバセンサ内蔵
高耐食型SPWC

光ファイバセンシング技術を備えた鋼製ケーブル

✓高い信頼性

- ・長大橋梁
- ・大規模建築物
- ・海洋構造物

約50年の長期実績
2006年より実海域で実績20年
供用13年超、最大水深1000m

明石海峡大橋（ハンガーケーブル） 浮漁礁 他（係留索）

既存設備による製造が可能

✓特性

剛性	◎非常に高い（弾性係数：196GPa）
疲労	◎高い（K1等級）
容量	◎大容量（安全率1.67で使用可） 橋梁向けPu=30100kNまで国内実績あり
クリープ	◎非常に小さい

✓高耐食
亜鉛線による電気防食

亜鉛めっき鋼線
亜鉛線
PE被覆

Figure 2 Advantages of steel cables equipped with fiber optic sensing technology

References

- NEDO News Release: https://www.nedo.go.jp/news/press/AA5_101959.html
- KOBELCO WIRE COMPANY, LTD. News Release: https://www.shinko-wire.co.jp/cms_news/pkobo_news/upload/117-0link_file.pdf

About Us

Neubrex was founded in 2002 in Osaka, Japan, as a spin-off from Osaka University.

Company, a worldwide leader and leading innovator for Distributed Fiber Optic Sensing (DFOS) solutions, providing cutting-edge monitoring systems for infrastructure and industrial applications. With an emphasis on innovation, reliability and sustainability. With offices in Japan, the United States, and Switzerland, company serves a diverse global clientele, across all industries, including operators in the transportation, energy and industrial sectors.

Neubrex delivers unmatched performance, reliability, optical power delivery, measurement versatility, and technical scalability in distributed fiber optic sensor systems. Critical infrastructure and industrial process operators worldwide trust in Neubrex's equipment, systems, and services. Our technology is applied on roads, bridges, tunnels, nuclear waste storage facilities, nuclear power plants, oil & gas fields, and geothermal system wells while meeting stringent requirements and objectives.

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