

CASE STUDY

BORLINK™ LS4201S SUPPORTING SUBMARINE CABLE POWER TRANSMISSION FOR THE WINDFLOAT ATLANTIC, PORTUGAL



Photo of the WindFloat Atlantic, Portugal (Courtesy of Hengtong Group)

BACKGROUND

As the world's first semi-submersible floating offshore wind farm, the WindFloat Atlantic (WFA) off the coast of Viana do Castelo, Portugal, will eventually produce enough power for 60,000 households per year, reducing carbon dioxide emissions by up to 1.1 million tonnes.

The WFA represents a significant technological milestone for Portugal in harnessing offshore wind resources to increase the share of renewables in its energy mix and transition towards a carbon-free economy by 2050.

Hengtong Group, one of the largest global optical fibre and power cable manufacturers in China, was selected to manage submarine cable power transmission for the WFA. Recognised in the industry for state-of-the-art cable engineering technologies and strong systematic integration capacities, Hengtong achieved numerous technological breakthroughs in the project.

CHALLENGES

Hengtong was appointed to design, manufacture and install an approximately 18km, 150kV submarine cable as a vital link connecting the WFA to the onshore power grid.

However, the environment of the WFA posed challenges such as:

- Limited time window for offshore construction and cable laying as the area is prone to hurricanes and large waves
- A breakwater situated in the landing area near the shore made it difficult to build ditches for landing cables without impacting the surroundings
- The connection between the wind turbine platform cable and the export cable had to meet the requirement of different cable diameters while also delivering high waterproof performance in sea depths of up to 100m

Thus, the submarine cables produced needed to be able to withstand extreme conditions in order to operate safely and reliably.

SOLUTION

Having worked with Borouge and Borealis on strategic national offshore wind projects in China, Hengtong selected the cable insulation grade Borlink™ LS4201S and semiconductor grade Borlink™ LE0592S from Borouge and Borealis to meet the challenging demands of the project.

Ideal for insulation in complex applications such as submarine cables, Borlink™ LS4201S is specially tailored for high stress high voltage applications with rated voltage of up to 230kV, and can perform at a maximum operating stress of 10kV/mm.

Produced under stringent cleanliness requirements, Borlink™ LS4201S offers XLPE cable producers the benefits of design flexibility, superior scorch security and a low degassing burden. This enables the production of compact cables with reduced insulation thickness and at extensive lengths without factory joints.

With lower risks of insulation defects and reduced degassing time, Borlink™ LS4201S enabled Hengtong to optimise their production cycle to achieve timely delivery of the high voltage submarine cables while still maintaining high quality standards.

General Manager of Hengtong International Submarine Cable System, Mr John Hsu remarked, “As Hengtong expands its international presence, we rely on trusted partners such as Borouge and Borealis, who have an excellent track record in delivering safe and reliable cable solutions that meet the demands of rigorous power transmission projects while supporting renewable energy development.”

SUMMARY

Project name	WindFloat Atlantic (WFA) Submarine Power Transmission EPCM project
Project location	Viana do Castelo, Portugal
Project owner	Rede Electrica Nacional, S.A. (REN)
Installation date	September 2019
Producer	Hengtong Group Co., Ltd
Application	HVAC submarine cable
Project requirements	Semi-submersible floating offshore wind power generation
Solution	Borlink™ LS4201S and Borlink™ LE0592S
Solution benefits	<ul style="list-style-type: none"> • Excellent scorch resistance performance • Low degassing burden • Produced under stringent cleanliness requirements to ensure quality consistency • High extrusion output • Proven track record in submarine cable applications

About Borouge and Borealis Borealis is a leading provider of innovative solutions in the fields of polyolefins, base chemicals and fertilizers. With its head office in Vienna, Austria, the company currently has around 6,900 employees and operates in over 120 countries. Borealis generated EUR 8.1 billion in sales revenue and a net profit of EUR 872 million in 2019. Mubadala, through its holding company, owns 64% of the company, with the remaining 36% belonging to Austria-based OMV, an integrated, international oil and gas company. Borealis provides services and products to customers around the world in collaboration with Borouge, a joint venture with the Abu Dhabi National Oil Company (ADNOC). Borealis and Borouge aim to proactively benefit society by taking on real societal challenges and offering real solutions. Both companies are committed to the principles of Responsible Care®, an initiative to improve safety performance within the chemical industry, and work to solve the world's water and sanitation challenges through product innovation and their Water for the World programme.

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