

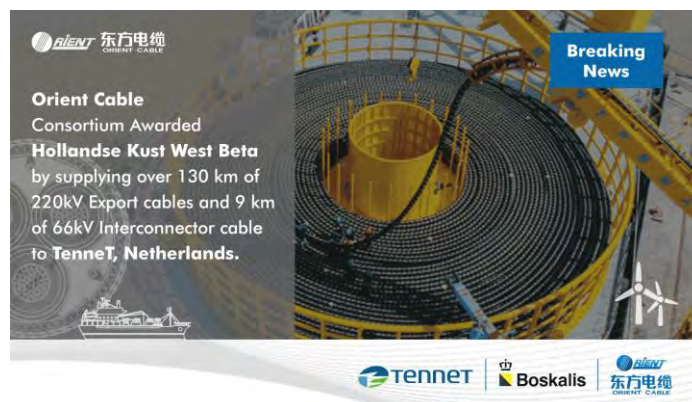
Orient Cable (NBO) Consortium Awarded Hollandse Kust West Beta by supplying over 130 km of 220kV XLPE-insulated Export cables to TenneT, Netherlands

Time:2022-03-24

Orient Cable has been awarded the Hollandse Kust West Beta export cable contract by TenneT, in consortium with Boskalis. The contract scope comprises the supply and installation of two 65-kilometer-long export cables that will connect the planned Hollandse Kust West Beta 700 MW offshore wind farm to TenneT's onshore grid in the Netherlands. Furthermore, Orient Cable will supply a 9-kilometer-long 66kV interconnector cable between the Hollandse Kust West Alpha and Hollandse Kust West Beta offshore substations. Orient Cable will execute this contract in consortium with its partner Boskalis that will install the high-voltage cable system. The two 220kV AC cable circuits will come ashore near the existing onshore high voltage substation at Wijk aan Zee, the Netherlands. The value of this contract for Orient Cable is considered to be sizable.

For this project, Orient Cable will design, engineer, manufacture, test and transport approx. 130 km of 220 kV XLPE-insulated Export cables and associated accessories termination works. The subsea cables will be manufactured in Orient Cable state-of-the-art subsea cable digital factory in Ningbo, China, the World largest cable manufacturing facility for the high and extra-high voltage subsea cables. Boskalis will deliver an integrated solution of in-house services including the removal of unexploded ordnance from the seabed, geotechnical and geophysical surveys, beach and seabed preparation works and the lay and burial of the 220kV export cables. The Hollandse Kust West Beta offshore windfarm is expected to enter service in 2025.

The Hollandse Kust (West Beta) project is apart of the Dutch national roadmap to achieve a 49% reduction in CO₂ emissions by 2030. With this project and through its client TenneT, Orient Cable is supporting the de-carbonizing by making renewable energy available in the Netherlands.



NBO successful award of 1GW offshore wind farm project

Time:2022-03-24

We are delighted to announce the successful award of 1GW offshore wind farm project at Yangjiang, Guangdong Province, developed by @GUANGDONG ENERGY. The EPCI contract value is over €240M, including the 2 circuits 60km 500kV 3-core export cables supply, engineering, transportation, installation and pre-commissioning. This innovative 500kV HVAC subsea cable is the first commercial application for the offshore wind farm in the world. It is another key milestone for Orient Cable in the high-end EHVAC power transmission technology following the successful delivery of 500kV 1 x 1800mm² subsea cable project 500 kV HVAC interconnection project for China state grid since 2019.



Breaking

The **first** commercial application of **500kV HVAC 3-core** subsea cable in the world

广东省能源集团有限公司
GUANGDONG ENERGY GROUP CO., LTD.

CGEC
中国能建

ORIENT CABLE
东方电缆

NBO successful award of 1GW offshore wind farm project

Successful award of offshore wind farm project developed by MINGYANG SMART ENERGY

Time:2022-02-21

We are thrilled to announce the successful award of offshore wind farm project developed by MINGYANG SMART ENERGY. This 220kV export & 35kV inter-array cable EPCI contract value is over 190M Euros! The 500MW windfarm has 59 turbines of 8MW and 2 turbines of 16.6MW. The 73.69 km² array area is located close to the Yangjiang coastline in Guangdong Province, 55 km south to the landfall. Water depth ranges from 41 to 46 meters (LAT).

A photograph of an offshore wind farm construction site. In the foreground, a large yellow steel structure, likely a substation or foundation, is being built on a pile of steel legs in the ocean. In the background, several wind turbines are visible on the horizon under a cloudy sky. The image is overlaid with text and logos.

Breaking News

Successful award of offshore wind farm project developed by **MINGYANG SMART ENERGY.**

EPC Contract value Over 190M Euros

MINGYANG SMART ENERGY
明阳智能

ORIENT CABLE
东方电缆

Orient Cable (NBO) has successfully completed dynamic subsea cable project on EPCI basis for the world first pilot Anti-typhoon Floating Wind Turbine

Time:2021-09-02

Historical achievement ! Orient Cable (NBO) has successfully completed dynamic subsea cable project on EPCI basis for the world first pilot Anti-typhoon Floating Wind Turbine in China for China Three Gorges (CTG). This project will generate power of 5500 kilowatt per hour, serving 30,000 households with clean energy.

“We see this project as a typical case by working closely with the stakeholders engaged (#CTG,#MINGYANG,#WISON,#DNV)from the very beginning, to clear up challenges in difference scenarios and interfaces and select the best solutions for this project. A long-standing partnership, as a driver and commitment of NBO, do help to make a great success” , says Mr. Zhou Zewei, Chief Engineer of NBO.

On 1st September ,with the commissioning test being completed, it indicates the World's First Anti-typhoon Floating Wind Turbine, developed by China Three Gorges (CTG), successfully finished all the offshore work and is ready to connect with the 400 MW Yangxi Shapa III Offshore Wind Farm.

Considering the extreme weather condition in South China Sea, it needs the dynamic cable to meet the requirements operating under even 17 class typhoon condition, which sets a lot of challenges for the whole engineering work, including tensile, anti-bending, anti-fatigue, etc. Besides, distributed buoyancy and ballast are adopted to keep the configuration in shallow water(depth ranging from 29m-35m). NBO engineering team with years of experiences in Umbilical in O&G, conducted various calculation and dynamic modeling considering all possible circumstances at engineering phase to ensure a safe installation operation.

There are far more stories and experience to be told, and a separate webinar will be held to share more information. Follow us to know more about the dynamic cable.

NBO is ready to meet the high standards of dynamic cables for next generation offshore wind farm development. Let's shape the future's renewables and create a clean world.



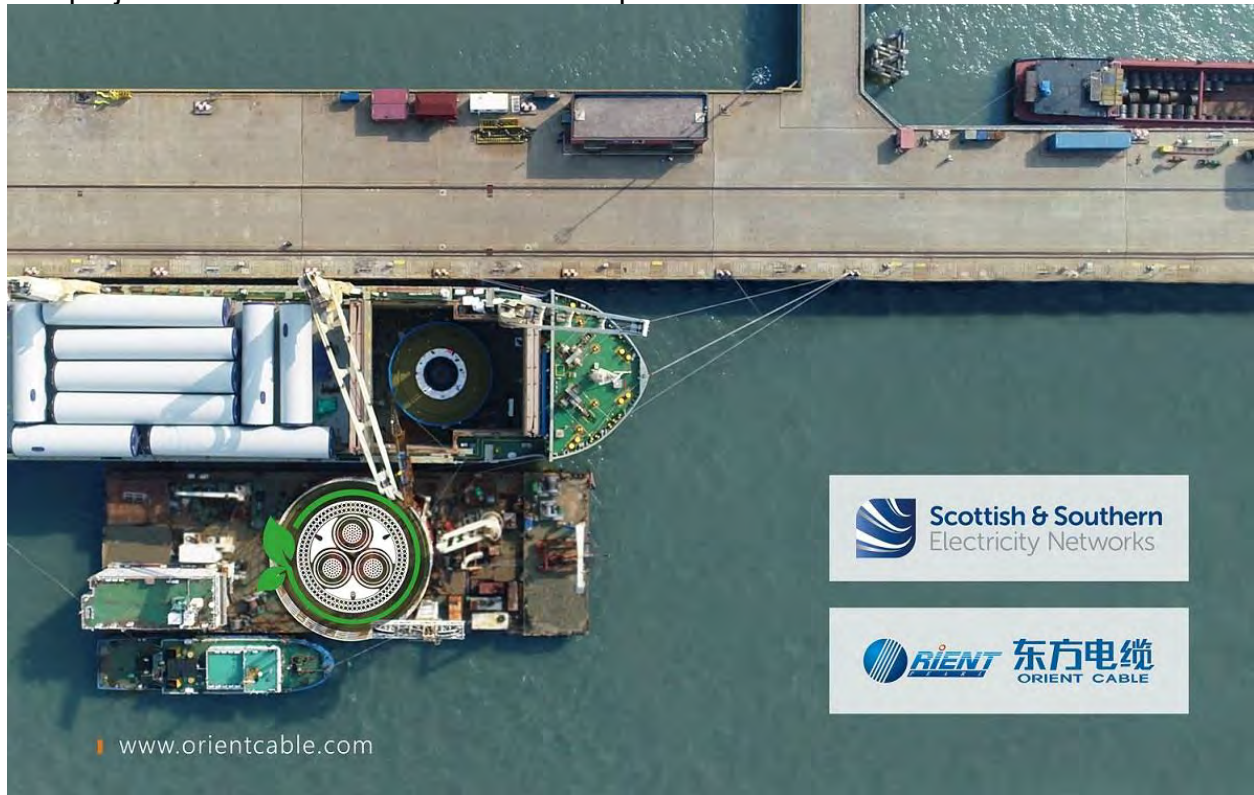
Successful Delivery of Subsea Cable for SSEN Skye-Harris 33kV Cable Supply Project.

Time:2021-05-18

After four months' continuous manufacturing work and loadout process, a big milestone for this cable replacement project is completed - the 38km 33kV submarine cable production formally comes to the end and is successfully loaded out to the transportation vessel. It will be further transported to UK and installed in the latter half of the year.

The whole project is executed during the global COVID-19 pandemic situation, which puts much challenge for all the work, especially the global supply chain management. However, with the support from our clients, team members and partners, we finally overcome all the difficulties and complete the work successfully. It again proves Orient Cable's ability in global business arrangement and overseas project execution.

Additionally, in order to help our client better manage the project, for the first time we used our own Remote Monitoring System(RMS) to achieve online progress report. The client can check the production status, loadout process, logistics tracks in real time. In the future, we will integrate this system into all projects, and help our client know their own projects no matter what time and what place.



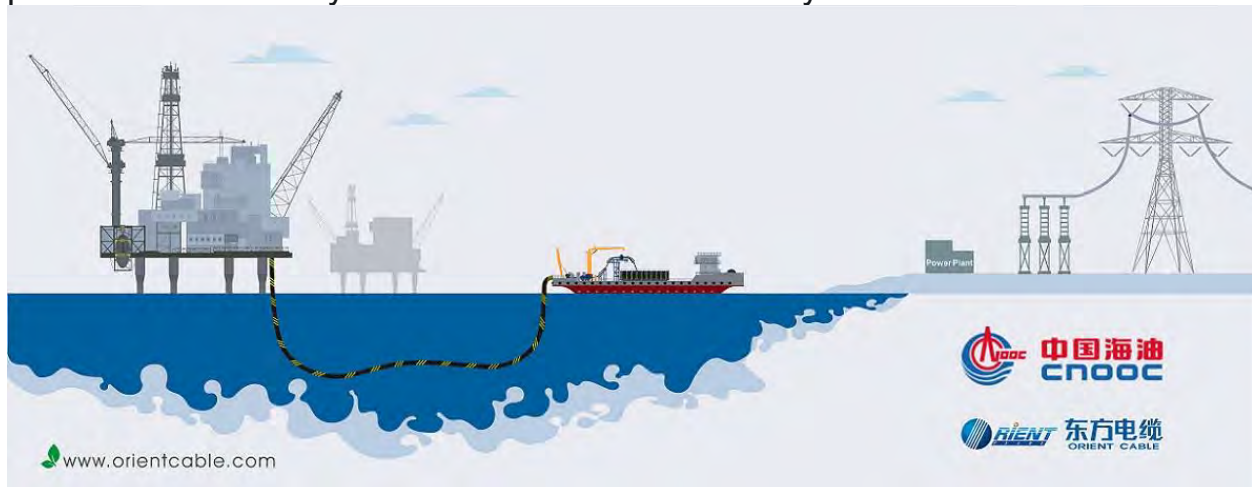
Orient Cable (NBO) has successfully delivered the 220kV subsea cables for China's first shore power supply project.

Time:2021-04-23

Orient Cable (NBO) has successfully delivered the 220kV subsea cables for China's first shore power supply project.

QingHuangDao32-6 and CaoFeiDian11-1 offshore platforms are first demonstration project in CNOOC as the strategy to make shore power supply in Bohai Bay. The main purpose is to reduce the CO2 emission and improve the power efficiency generating by traditional approach of burning oil and gas. Since this is one EPC contract for Orient Cable, our offshore engineering team will carry out the cable installation work soon afterwards. The estimated operation time is the end of June.

Orient Cable (NBO) has won this project in last May. Less than one year's design and manufacturing, the 70km subsea cable (220kV 3X630mm²) production has finally come to the end and is ready for installation.



WIND FARM

Values USD\$73.8M | Client: Huaneng Group

Background

As a leading submarine cable provider in China, Orient Cable successfully awarded the contract which values around \$73.8Million. It was reported that the submarine cables are to be applied in an offshore wind farm located in Dafeng, Jiangsu Province.

Challenges

- The longest power transmission line up to 117km in the offshore wind farm industry of China.
- Historical largest contract value of Orient Cable
- The most pressed time ever for fulfilling a project within 7 months.
- The highest quality standard

Scope of Supply

- 117KM Submarine composite cable HYJQ41-F 3*500mm² 220kV
- Supervision during cable laying
- Accessories supply
- Est. Delivery in Aug. 2018



Impact

With the prosperous of offshore wind farm in China, Orient has been made contribution to the construction of this industry since 2010. The success of this project represents that Orient has made a great progress in submarine cable production, and has break through the monopoly of overseas submarine cable suppliers.

To ensure the high quality of cable manufacturing, Orient innovated super-clean compound excludes contaminations larger than 100 microns in size and controls those below 70 microns. This gives assured high levels of cleanliness and, therefore, reliable long-term performance.

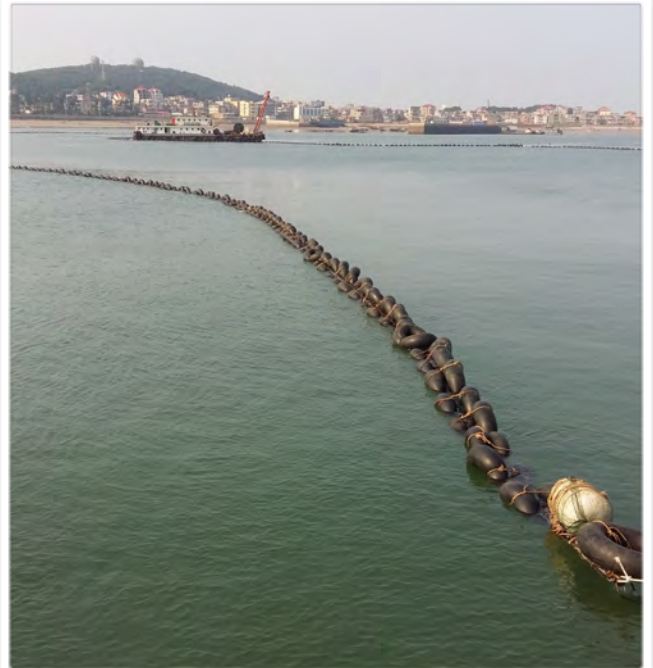
Client Introduction:

China Huaneng Group is a key state-owned company established with the approval of the State Council. Huaneng commits to building itself into a large enterprise group with international competitiveness. By the end of 2016, the company had total installed capacity of 165GW, with assets distributed all over China and overseas.

Case Study

400MW 220kV Fujian Putian Offshore Wind Power

Interconnection Transmission Project in 2015



Submarine Cable Data

- ▶ Voltage: 220kV
- ▶ Power Transmission Capacity: 400MW
- ▶ Total Length of Cable: 36.3km
- ▶ Cable Spec.: HYJQ71- CU/XLPE/LEAD/PP-Roving 1x1600mm² +2x16(12D+4A)
- ▶ Year of Completion: 2016

Project Background

Orient Cable had provided Fujian Longyuan Nanri Island 400MW 220kV, 1x1600mm² submarine composite cable in 2015, which is the first 220kV project in China. Orient Cable had undertaken the National Science and technology Supporting Program since 2007.

Scope of Work

Orient Cable manufactured, delivered and installed the 220kV submarine composite cable. The scope also included accessories assembly, survey of cable routes, onshore works and supervision during cable laying.

Challenge

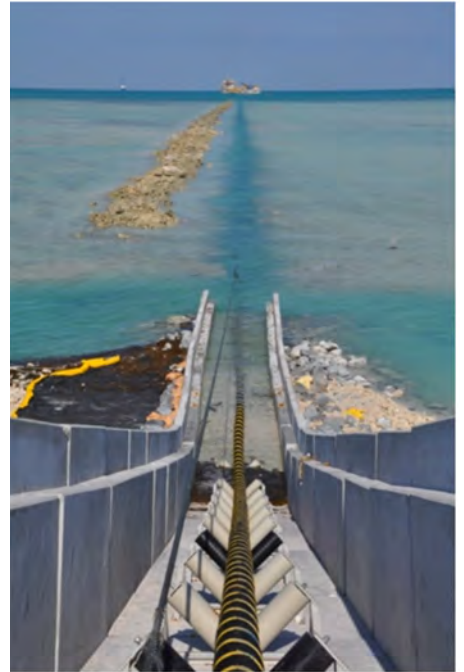
Round steel wire armoring was firstly used in this project, which has a great challenge for transportation, installation and laying.

The competitive advantage is improving the lateral pressure and transmission capacity of submarine cable.

Commissioning

By Aug. 2015, the cable had been successfully delivered to the customer. The entire cable system was handed over to the client in time for operation by the end of December, 2016.

Guodian Putuo #6 offshore wind farm II Zone



Background

Cooperation between Orient Cable and China Guodian Energy Group Corporation on offshore wind farm projects dates back to 2009. Orient Cable, as the supplier of 110kV submarine cable to its Longyuan–Fujian project, was the highest-voltage offshore wind farm power transmission project in 2009.

China Guodian Putuo #6 offshore wind farm II Zone is located in the southeast of Liuheng Island in the city of Zhoushan, with a total area of about 50 km². The water depth is 12m~16m. The center of the wind farm is about 11km away from Liuheng island and it was officially started construction by the end of December, 2016.

Orient Cable

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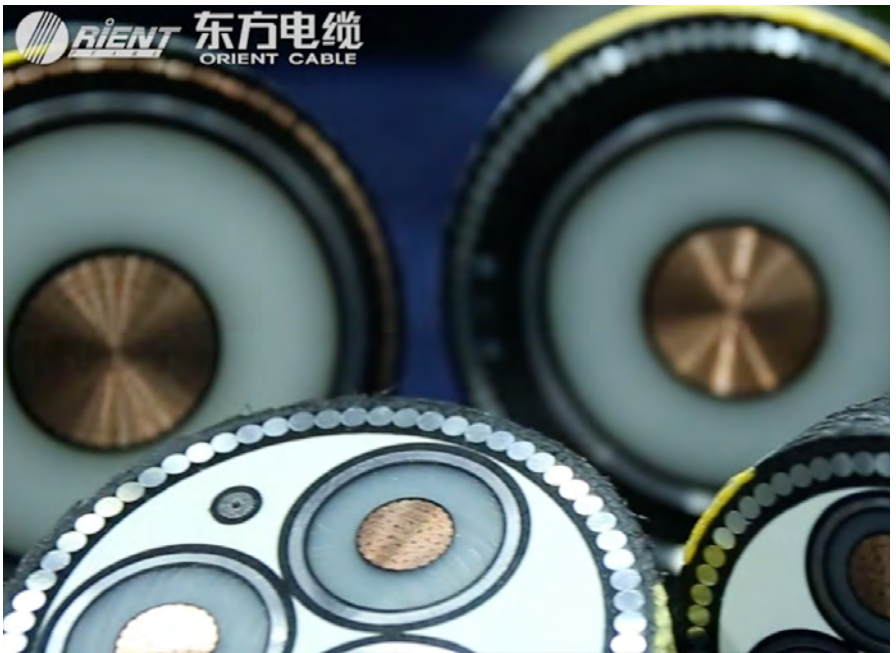
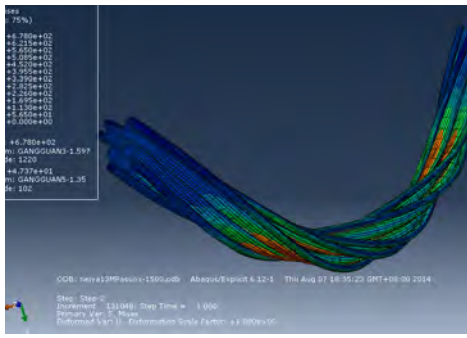
Email: orient@orientcable.com

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Add. No.968 Jiangnan Road, Beilun District, Ningbo, China

Post Code: 315800



Challenges

- Long Length
- No pre-existing experience in Zhejiang Province
- Rough environment undersea

In pellentesque rhoncus sapien:

Benefits

- The investor of this project is Guodian Electric Power Development Co., Ltd., a subsidiary of National Energy Group, and the project is of great significance for the new energy to lead the enterprise transformation and realize the green development.
- With an average annual power generation of 3,000 hours, the total capacity of installed 250,000kilowatts of electricity can generate 700 million-kilowatt times or more per year.

Summary

- Client: China Guodian-Zhejiang Zhoushan Offshore Wind Power
- Cable Spec.: HYJQ41-F-127/220kV-1×630+2×24B1 CU/XLPE/LEAD/CWA/PP-Roving
- Time of Delivery: July, 2017

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200MW \pm 200 kV Multi-terminal Flexible HVDC Interconnection Transmission Project in 2014



Submarine Cable Data

- ▶ Voltage \pm 200kV
- ▶ Power transmission capacity: 200MW
- ▶ Total length of Cable: 39.9km
- ▶ Type: DC-HYJQ41-F 1*500mm² Cu+2*18
- ▶ Year of Completion: 2014

Project Background

China Southern Power Grid company undertook the "wind farm flexible DC transmission access technology research and development" and plans to start up the flexible DC \pm 160kV/200MW Nan'ao Island project in Shantou region, Guangdong Province.

Scope

ORIENT CABLE manufactured, delivered and installed the polymeric insulated (XLPE – cross

linked polyethylene) submarine \pm 160kV cable.

The scope also included survey of cable routes, on-shore works such as building a transition yard, trenching and cable laying, cable burial at shore approach, cable crossings and tiebacks, terminations and splicing, provision of final testing and commissioning.

Installation challenge

The whole length (39.9km) of this flexible cable with no factory joints, which bring more difficulty in transportation and constant production.

Commissioning

By April, 2014 the cable had been successfully delivered to the customer. The entire cable system was timely handed over to the client for commercial operation in November 2014.

ISLANDS CONNECTION

Background

Zhoushan-Yushan Power Project is in the west of Zhoushan islands, Zhejiang Province. The designed 220kV submarine cable route with length of 18.65km will connect the city of Zhoushan with island of Yushan.

Challenges

- The longest submarine composite cable with flat copper wire armor at rated voltage of 220kV in China
- Rough environment for laying and installation, as well as for the quality of cable

Solutions

- Did research of flat copper wire armor for a long time
- Upgraded facilities

Advantages of Flat Copper

- No Hysteresis Losses
- Smaller Outer Diameter
- Good Anti-lateral Pressure performance



Impact

Ningbo Orient Wires & Cables Company Ltd has grown rapidly to become a major submarine cable manufacturer for the full range of power transmission applications and Oil & Gas Application. Of particular importance is its special expertise in the design and development of AC and DC submarine cables, in respect of which it has played a key role in drafting the national standard.

Orient is one of suppliers of China National Grid for its Zhoushan-Yushan project in Zhejiang Province. The purpose of the project is to transfer the renewable energy from Wind Farm to meet the country's energy strategy requirement. The project required the provision of 70 km of 220kV submarine cable with integrated power and signal transmission capability - the longest 220kV optic/electric composite submarine cable with copper wire armour.

Wind Farm Project



Background

Dafeng Offshore wind farm, located in the north side of city of Yancheng, covers sea area around 97km², with installation capacity of 300MW.

End user of this project is China Three Gorges New Energy Co., Ltd. which is one of the largest company focusing on clean energy of large-scale hydropower develop and operation.



Impact:

According to the expectation of China 5-year plan in 2015, the total installation capacity of offshore wind farm should reach 5,000MW by the end of 2020. To meet the goal, Chinese government invested tremendous capital on this field. As a leading submarine cable supplier, Orient had been participated in the construction of wind farm since many years ago.

Dafeng, one of the proposed wind farm projects by government will bring economic benefits to local tourism and business with meeting the policy of long-term development and green environment.

Case Study

Shenhua Group Dongtai Offshore Wind Farm Phase4 Project



Submarine Cable Data

- ▶ Voltage $\pm 220\text{kV}$
- ▶ Power transmission capacity: 300MW
- ▶ Total length of Cable: 100km
- ▶ Type: HYJQF41-F-127/220-3*500mm² 3*500mm² Cu+2*36FO
- ▶ (CU/XLPE/LEAD/PE/G.SWA/PP-Roving)
- ▶ Year of Completion: 2018

Project Background

The project is located in Jiangsu Province, 42 km to the shore. The total installation capacity is 300MW with 1~17m water depth.

Challenges

Since the urgency of this project, the cable should be delivered in Feb.2018, which means there are only 7 months for the cable manufacturing.

Meanwhile, it is the most difficult project for the submarine cable installation, as long cable route (approx.50 km) involves the shallow water installation.

Solution

To meet the tough condition, Orient Cable picked the world-famous installation material supplier BORELIS from Austria for the submarine cable, meanwhile, Orient Cable update manufacturing facilities specially for this project including:

1. To allocate 5 storage carrousel with diameter of 32 meters to meet the long length storage (Loading capacity up to 400ton).
2. To upgrade cable track to port for trans-pooling.
3. To mob 4 supporting barges onside for onshore cable landing.

RANK #1 IN THE WORLD

First 500kV XLPE Submarine Cable

Background

Global Energy Interconnection Development and Cooperation Organization launched a press conference and announced that currently the total length of global power line is around 75million km, in which the length of transnational power interconnection line is about 10,000km and its network capacity is about 250 million kilowatts and expected to reach 330 million kilowatts by 2020.

Challenges

- 18.15km per phase
- Special requirement as less than 2 factory joints
- First highest voltage XLPE cable in the world



Impact

The smooth implementation of the project is another milestone of Orient Cable in its industrial transformation and upgrading, marketing that design, development and manufacturing of UHV submarine cables in Orient Cable and even in China have reached the international advanced level and will also serve and provide energy transmission solutions to the global energy interconnection and Maine economy Development.

This project is an achievement of the company's adherence to independent innovation and industrialization of science and technology projects.