ENLIGHTENING THE FUTURE

HENGTONG OPTIC-ELECTRIC CO., LTD.

The Headquarter in Suzhou, China

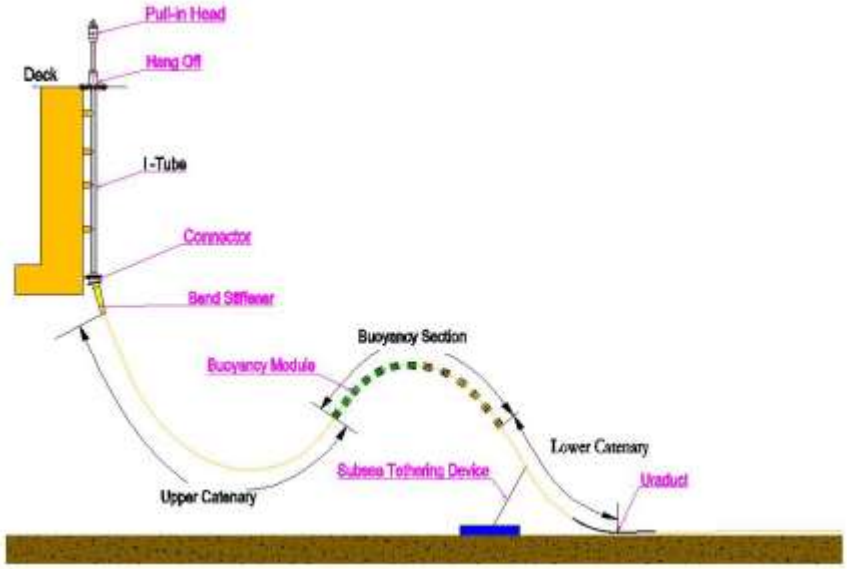
Selected Project References

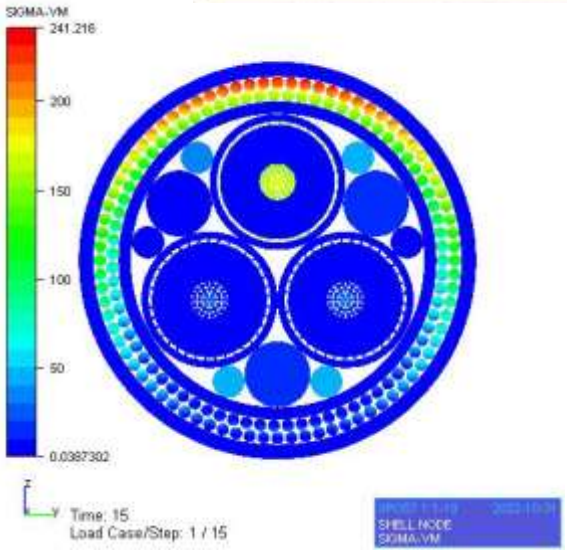
Cable System Design Study References

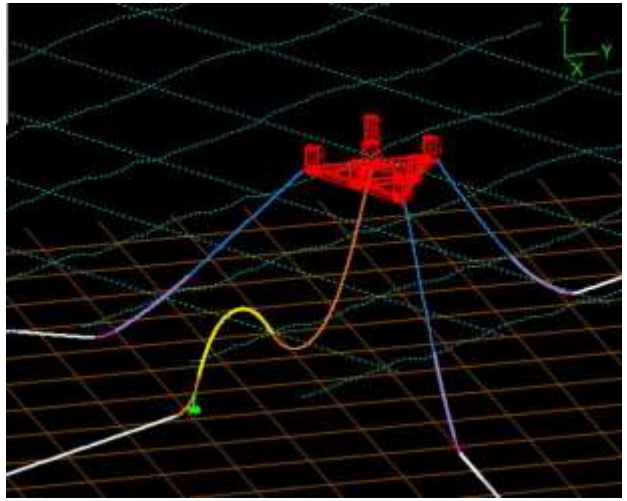
Floating Windfarm Project in Europe

Overview

- Rated voltage: 66kV
- Rated power per wind turbine: 12MW
- Max water depth: 130m
- Max platform offset: 50m







Engineering design work

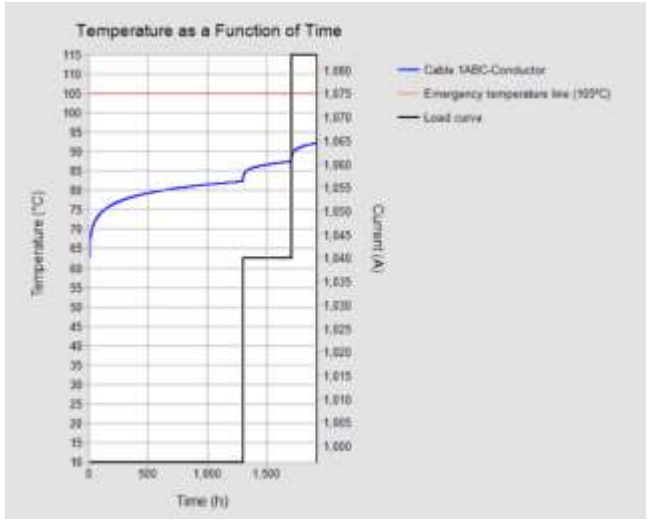
- Current rating and short-circuit current calculation
- Cross-section determination
- Design of cable system configuration
- Initial fatigue analysis
- Calculation of electrical system parameters
- Calculation of mechanical parameters
- Selection of cable accessories

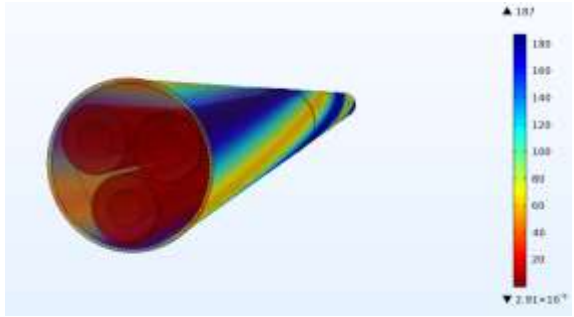
Cable System Design Study References

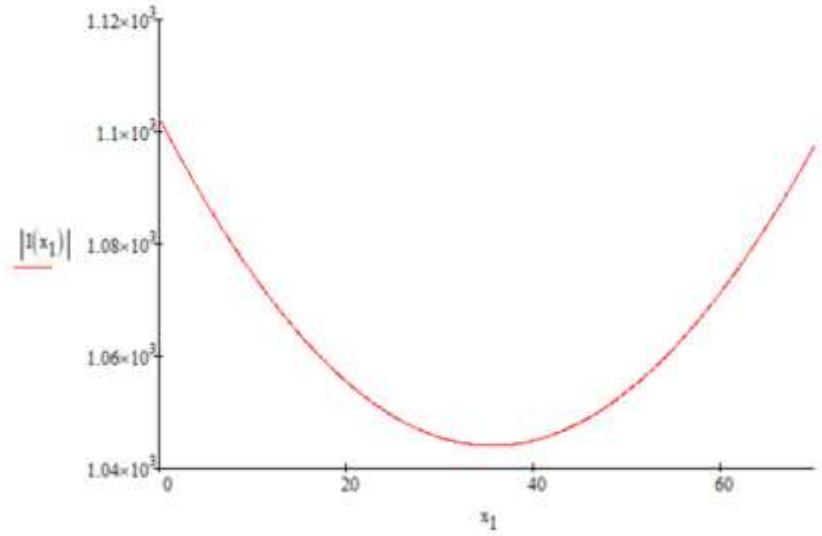
Export cable System for typical Windfarm Project in Europe

Overview

- Rated voltage: 275kV
- Transmission power: 1GW
- No. of circuits: 2
- Max. Water Depth: 50m
- Cable route length: 70km







Engineering design work

- Current flow analysis along the route
- Dynamic rating calculation
- Cross-section determination
- Design of earthing system
- Selection of cable accessories
- Calculation of electrical system parameters
- Calculation of mechanical parameters

Engineering Feasibility Study References

Myanmar Kyaukpyu 66kV Subsea Cable Project

PROJECT OWNER **:**

Huayan Group Corporation

Overview

- Transmission Capacity: 40MW
- No. of Cables: 2
- No. of Landing Points: 4
- Total Route Length: 5.0km
- Max. Water Depth: 38m

Scope of Work

- Hydrometeorological and geological conditions
- Selection of submarine cables and accessories
- Preliminary planning of cable routing
- Electrical and mechanical design of the proposed cable
- Recommendations for laying and protection of cables
- Cost estimation
- Preliminary environmental impact assessment
- QHSE requirements

Engineering Feasibility Study References

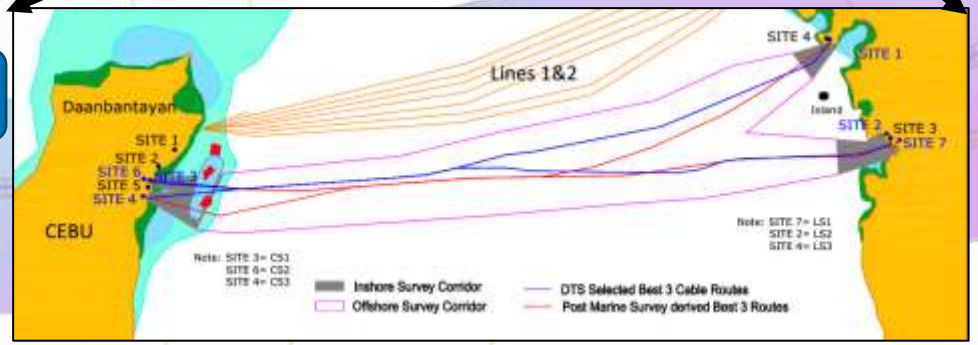
Cebu – Leyte Lines 3 & 4 Interconnection Project (CLIP)

PROJECT OWNER:

NATIONAL GRID CORPORATION OF THE PHILIPPINES

Overview

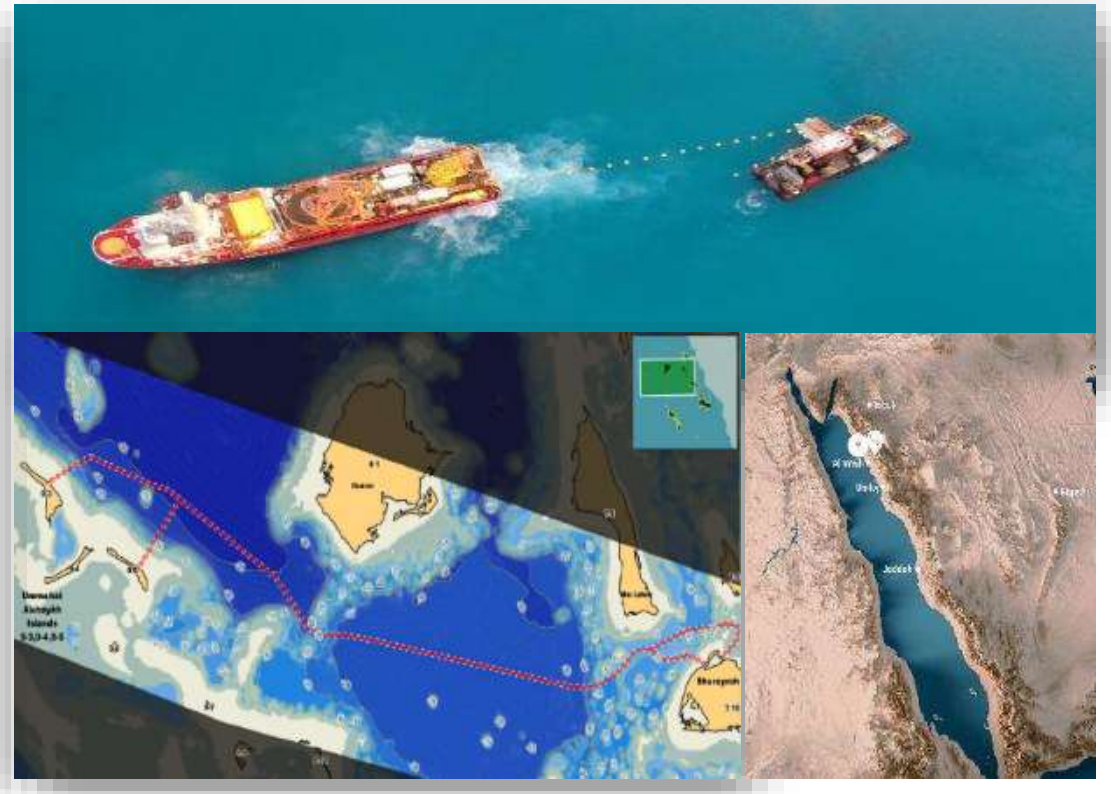
- Transmission Capacity: 600MW
- No. of Cables: 9
- Potential Switching Stations: 3 at each end
- Potential Routes: 3
- Route Length: Approximately 40km
- Max. Water Depth: 350m



Scope of Work

- Analysis of survey results
- Cable route corridor selection
- Analysis and assessment of risks
- Electrical and mechanical design of the proposed cable
- Engineering of the cable transportation, installation and protection
- Examination of the cable's costs and benefits
- Maintenance strategy for the proposed cable
- Detailed budget for the project

EPC Project References



Farasan-Madayah 132kV Project

Owner:	Saudi Electricity Company (The SEC)
Location:	Saudi Arabia
Contract Year:	2023
Status:	On-going
Transmission Capacity:	480MW
Scope of Work:	Submarine cable system engineering, manufacturing, transportation, installation, test, and commissioning test.
The Cable	132kV submarine cable of 328.2km

The Red Sea Project

Owner:	The Red Sea Company
Location:	Saudi Arabia
Contract Year:	2021
Scope of Work:	EPC(Design, manufacturing, transportation, installation and commissioning test)
The Cable:	33kV submarine power cable of 61.5km

EPC & M Project References

The Windfloat Atlantic Offshore Wind Power Project

650m HDD For Cable Landing
The First Chinese Cable Maker applied HDD in EU

Rock dumping for Cable Protection first contractor from China
The First Chinese Cable Maker applied in EU

The World-First 66kV underwater dry-mate connector

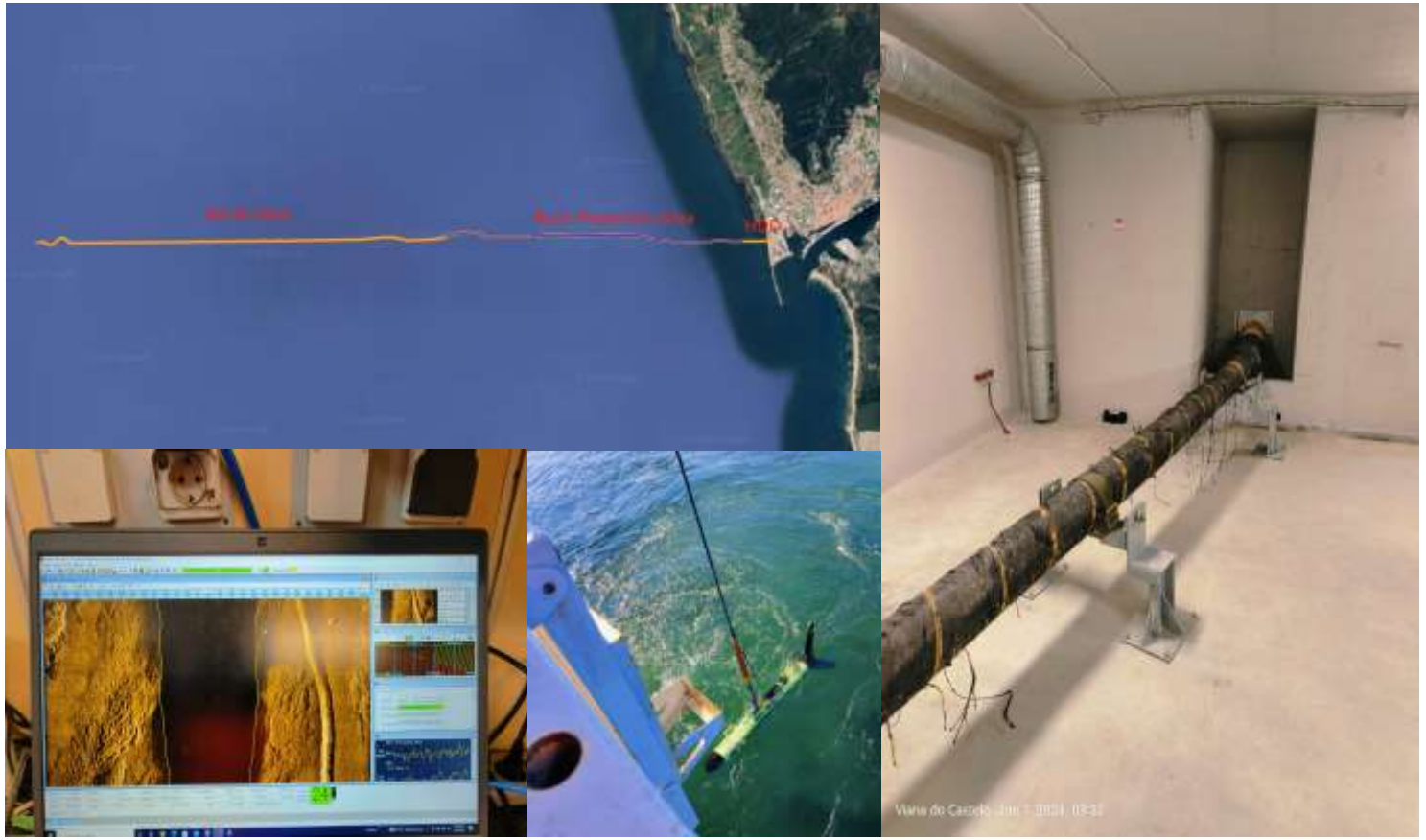
Resources coordinated from 10+ nations
Competent international QHSE system & Project Management competence

10 Years Maintenance Service
The first Chinese cable maker get IMR in EU

EPC & M Project References

The Windfloat Atlantic Offshore Wind Power Project

- Maintenance Service on-going
- Inspection, maintenance and repair (if any) of the cable route
- Maintenance of the transition station onshore
- Diving inspection, side-scan sonar, multi-beam, etc. are applied.



EPC Project References

Offshore Wind Power Projects in Vietnam (since 2020)

The Leading Position

Has been awarded projects of **700⁺MW**, approx. **500⁺MW** ongoing

The Integrated Solutions

Customized, **integrated solutions** from design, manufacture to installation

Self-owned Capability

Self-owned cable laying barges, equipment, etc. are employed

High Efficiency & Flexibililiy

High efficiency in construction, and is capable of **cross-operation**

EPC Project References

Shore Power Connection Submarine Cable EPC Projects

Client	China National Offshore Oil Corporation (**CNOOC**)
Location	**Bohai Sea**, China • Qinhuangdao 32-6 and Caofeidian 11-1 Oil Fields • Bozhong-kenli Oilfield Group • Suizhong-Jinzhou Oilfield Group
Year	Since 2020, on-going
Scope of Work	HV & MV submarine cable system design, manufacture & installation (qty. of **over 500km**)

Manufactured 3-core **HV submarine cable** with **large cross-sectional area**

Cable system **installation** & dedicated **project management**

Single circuit length of max. 70⁺km, **number of joints minimised**.

HV submarine cable crossing with **existing pipes** managed

EPC Project References

EPCI for Full Replacement of 35kv Subsea Cable Pabelokan to Zelda-P (Indonesia)

35kV 3x500mm^2 Cu XLPE, 33.5km
Production (1 month)+Installation (2 month)

Cooperate, manage and supervise local sub-contractor

Construction of 12 Crossing Points, with existing pipes or cables

I-Tube Installation at Zelda-P Platform

PERTAMINA

PIAGAM PENGHARGAAN

PT Pertamina Hulu Energi OSES memberikan penghargaan
yang sebesar besarnya
Kepada:

PT Voksel Electric Tbk

TELAH BERHASIL MENYELESAIKAN PEKERJAAN INSTALASI KABEL BAWAH LAUT
DENGAN TEPAT WAKTU, AMAN DAN SUKSES
PROYEK PABELOKAN – ZELDA No. 4710007086
PT PERTAMINA HULU ENERGI OSES

Bandung, 5 Maret 2024
Manager Power & Gas Pabelokan Island

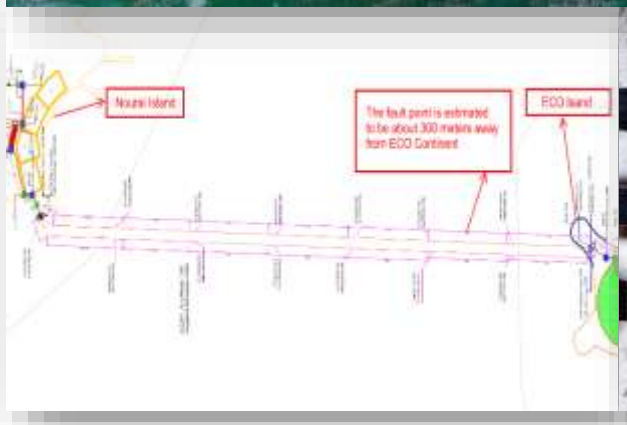
Roslihan Anwar

EPC Project References

Panas-Datag 15kV Submarine Cable Replacement

Client:	National Grid Corporation of the Philippines (NGCP)
Location:	Philippines
Contract Year:	2022
Scope of Work:	Retired cable recycle and new submarine cable manufacturing & construction
The Cable:	15kV submarine Power cable of 1.5km

Emergent Repair of Submarine Cable



Submarine Cable Emergent Repair Works

Owner:	Abu Dhabi Distribution Company (The ADDC)
Contractor:	The Tasneem
Location:	Abu Dhabi, UAE
Contract Year:	2024
Status:	Completed
Scope of Work:	Design, manufacturing, transportation, on-site jointing, installation & testing of the 22kV submarine cable, offshore flexible repair joint, onshore conversion joint.

EPC Project References

Jieyang Shenquan II 350MW OWF

Owner:	State Power Investment Corporation Limited (SPIC)
Location:	Guangdong Province, China
Contract Year:	2022
Scope of Work:	EPC of submarine cable system
The Cable:	220kV export cable of 107.62km & 66kV inter-array cable of 60km

Nanpeng Island 400MW OWF Project

Client:	China General Nuclear Power Corporation (CGN)
Location:	Guangdong Province, China
Contract Year:	2018
Scope of Work:	EPC of submarine cable system
The Cable:	220kV 3-core submarine power cable of 72km

Cable Supply References – Offshore Wind Power

Zhanjiang Xuwen Offshore Wind Farm Project

Client:	China State Grid
Location:	Guangdong Province, China
Contract Year:	2020
Scope of Work:	Submarine cable & accessories supply
The Cable:	220kV 3x1000mm^2 submarine cable, single length of over 40km

Longyuan Dafeng (H12) 200MW OWF

220kV 1×1600mm^2 submarine cable
Location: Jiangsu Province, China
Contract Year: 2017
Total length: 89.4km
Single length of 30.2 km without factory joint

Other OWF Project References (selected)

No.	Project	Product(s)	Year
1	Shantou Lemen II 594MW Offshore Wind Farm	220kV: 46km, 66kV: 76.28km	2022
2	Offshore Wind Power V 500MW Project in Shandong Peninsula	220kV: 38	2022
3	Dalian Zhuanghe Offshore Wind Farm IV1 300MW Project (EPC)	220kV: 44.2km	2021
4	Cangnan No.4 400MW Offshore Wind Farm	35kV: 117.4km	2020-2021
5	Jieyang Shenquan I 400MW Offshore Wind Farm	220kV: 70km, 35kV: 100.1km	2019-2021
6	Rudong H5# 300MW Offshore Wind Farm	35kV: 98.5km	2019-2021
7	Sheyang H1# 300MW Wind Farm	220kV: 137.4km, 35kV: 95.5km	2019-2020

Dynamic Cable References

X1 Wind X30 model

Client:	X1 Wind
Country:	Spain
Contract Year:	2020
SoW:	Cable supply and transportation
The Cable:	20kV dynamic cable of 1.4km

Fu Yao – The Floating Wind Turbine

Client:	China State Shipbuilding Corporation
Project	Limited
Country:	China
Contract Year:	2020
SoW:	Supply & Installation of dynamic cable system
The Cable:	35kV dynamic cable of 0.5km

WAVE ENERGY CONVERTER (WEC) DEMO

Client:	CorPower Ocean Lda
Country:	Portugal
Contract Year:	2021
SoW:	Cable supply and Transportation
The Cable:	6kV TR_XLPE 3x1x95Cu +FOC of 6.2km

Fu Yao – The Dynamic Cable Verification

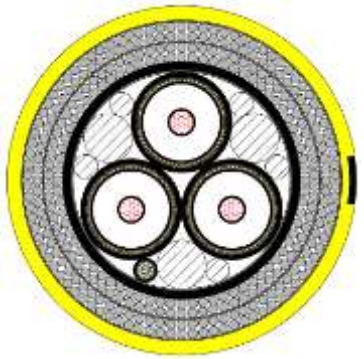
Third Party Certification by:

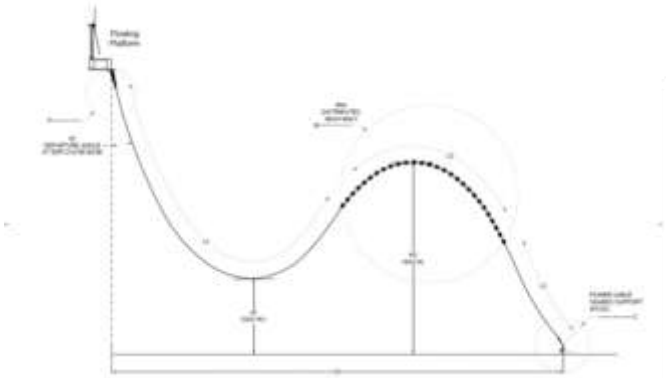
Bureau Veritas

9 CONCLUSION

On the basis of the reviewed engineering documents listed in APPENDIX A and of project data and within BV Scope of Work, we may achieve the following conclusions.

It is found that most of the design documents submitted by HT related to this depot is within the acceptance criteria of local Chinese codes as well as international standards as listed in Section 2.





BUREAU VERITAS REPORT
N°BVMC- DRC/SH-21227-01

Issued by: Dongjun Wang
Offshore Department Manager of Bureau Veritas I&F, OGC / Marine China

INDEPENDENT DESIGN REVIEW REPORT
For Dynamic submarine cable (Floating wind power)
BUREAU VERITAS Project N°BVMC- DRC/SH-21227

NAME : Dynamic submarine cable Project

LOCATION : Shanghai/Changshu

BV CLIENT :Jiangsu Hengtong high voltage submarine cable Co., Ltd

Prepared by	Checked by	Approved by	Revision	Date
YFZ	HBY	DJW	0	2022.06.01

Cable Supply References – EHV Interconnection

The World-First Transmission Tower

of 380 meters high

Continuous production of insulation for 23 days

18.15km submarine cable without joint

The World-First

500kV XLPE submarine cable

The Jiangsu Satellite TV

take an in-depth look into this Project

Cable Supply References – Interconnection

Koh Tao 33kV Submarine Cable Project (Thailand)

33kV 3x300mm^2 submarine composite cable
Project Owner: Provincial Electricity Authority (PEA)
Contract Year: 2022
Single length of 38km without factory joint

ISLA MUJERES and the HOLBOX Projects (Mexico)

34.5kV 1x500mm^2 submarine composite cable
Clients: Ingeniería Coliseum, Electro Servicios HR
Contract Year: 2022
Total length of 66.84km

Oil & Gas Project References

The North Basin Exploration Project

Project Owner:	HESS Corporation
Location:	Malaysia
Contract Year:	2021
Scope of Work:	Design & manufacture of 6/10kV 3x70mm^2+12FO submarine composite cable & accessories; installation of the accessories

The Kuzey Marmara Gas Field Project

Project Owner:	BOTAŞ
Location:	Türkiye
Contract Year:	2021
Scope of Work:	Design & manufacture of 3kV 3x50mm^2+24FO submarine composite cable & accessories

Summary of WTG Installation References

2013-2016

- No. of WTG installed: ***43***
- Installed capacity: 153MW
- Power generated: 153,000KW/h

2017-2018

- No. of WTG installed: ***74***
- Installed capacity: 316MW
- Power generated: 316,000KW/h

2019-2020

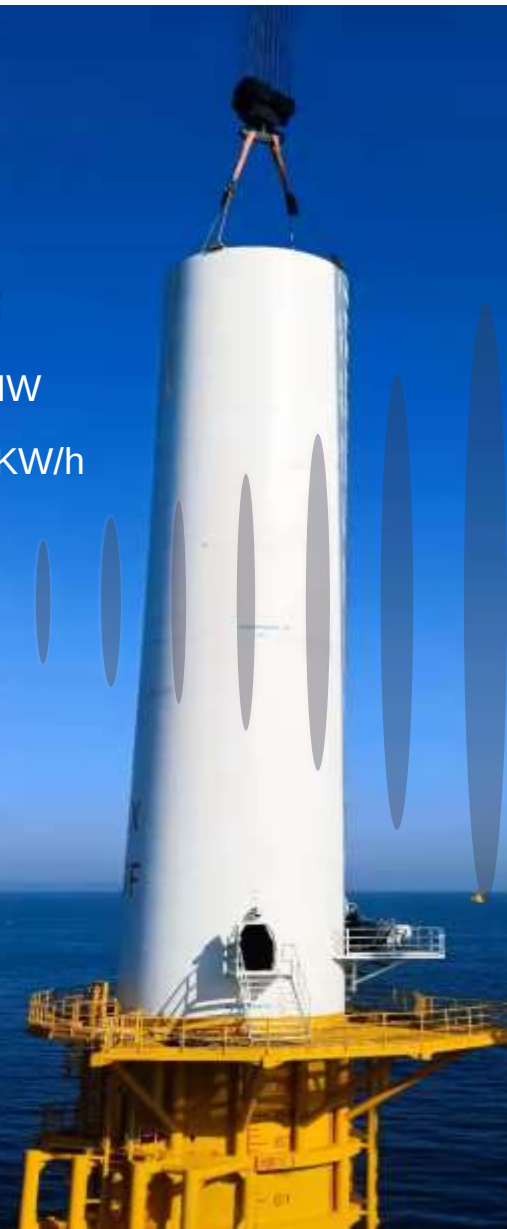
- No. of WTG installed: ***135***
- Installed capacity: 667.45MW
- Power generated: 667,450KW/h

2021-2022

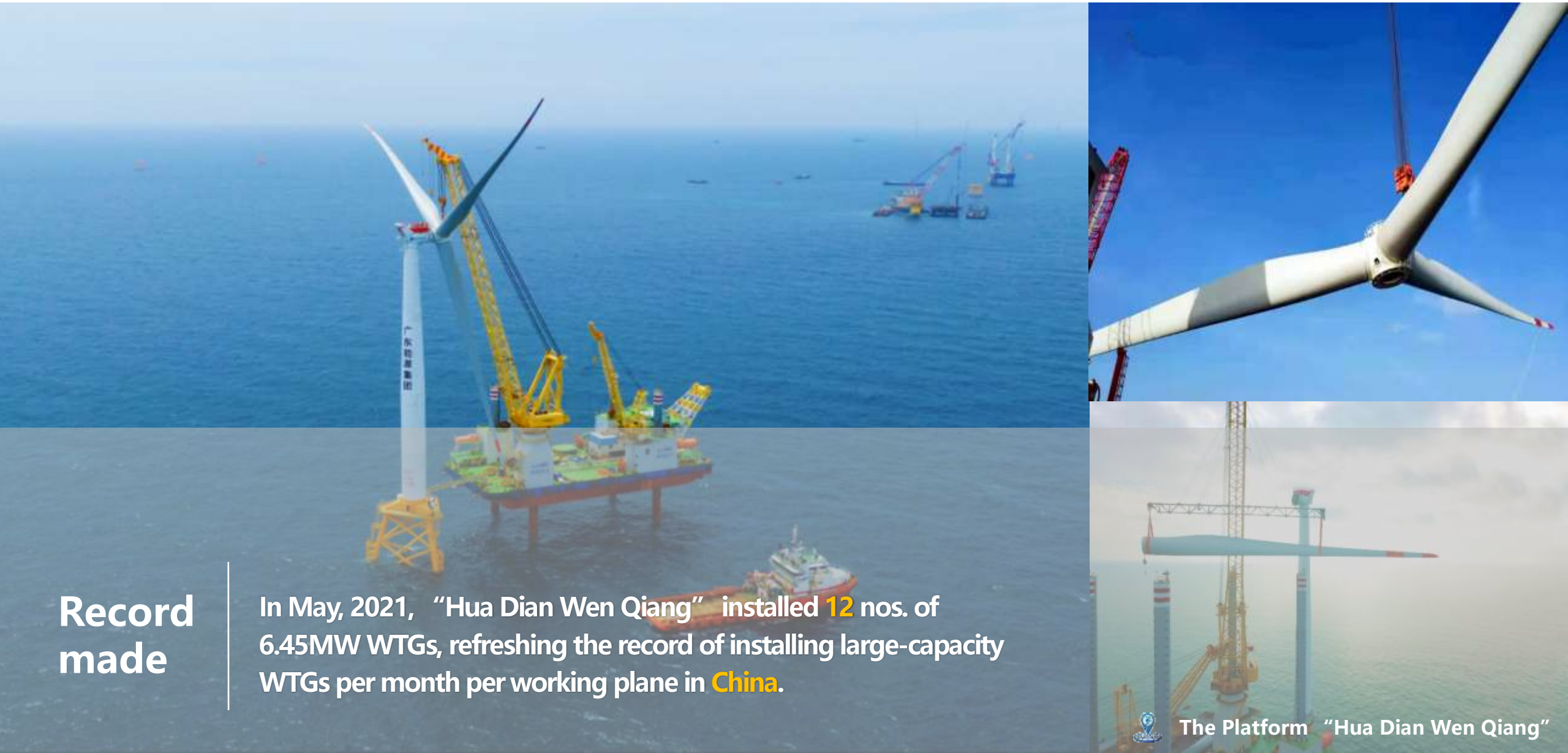
- No. of WTG installed: ***192***
- No. of offshore wind foundation construction: ***30***
- Major component replacement ***28***

2023

- WTG installation
- Offshore wind foundation construction
- Offshore wind foundation protection
- Operation of offshore wind platform
- Major component replacement
- ……



WTG Installation References (selected)



Record made

In May, 2021, “Hua Dian Wen Qiang” installed 12 nos. of 6.45MW WTGs, refreshing the record of installing large-capacity WTGs per month per working plane in China.

The Platform “Hua Dian Wen Qiang”

WTG Installation References (selected)

Datang Zhuanghe OWF I

Construction time: Jun. – Dec., 2021

Construction scope: 16 nos. of single pile driving, 19 nos. of 5.2MW WTGs installation & 16 sets of foundations' anti-erosion construction

Remark: The project is in the sea area of Zhuanghe, Dalian, with a capacity of 100MW. It is the first project of our company in Dalian. During China's rush-up for OWF, we coordinated numerous factors and made the best schedule, i.e., **to plan, get approved, construction and commissioning in the same year**

The Platform "Heng Tong Yi Hang"

WTG Installation References (selected)

The Platform “Heng Tong Yi Hang”

Huaneng Qidong H1, H2 & H3 OWF

Construction time: Aug. – Nov., 2021

Construction scope: Installation of 37 nos. of 5.5MW WTGs

Remark: The OWF with single largest capacity in China then; **installed 7 nos. of WTGs and 2 sets of impellers in the first month, refreshing the no. of large-capacity WTGs installed in Qidong sea area per month.**

WTG Installation References (selected)

SDE Bozhong OWF A

Construction time: Aug., 2022 – Mar., 2023

Construction scope: 19 nos. of 8.35MW WTGs installation & 30 nos. of foundation construction and protection

Remark: The first project that work as contractor, novel process of long-length WTG blade construction was applied, to solve the problem of difficulty in hook removal and small space after reverse clamping and docking. In a construction window of only 18 days, installed **7 nos. of 8.35 WTGs per month**, **refreshing the records of installing large-capacity WTGs per month per working plane in northern China sea area in 2022**.

WTG Installation References (selected)

Mingyang Yangjiang Qingzhou IV OWF

This project is the first OWF project that Hengtong Land did the foundation construction on its own, the upgraded self-owned offshore crane “Hengtong 3500” made its first presence also in the project.

Construction time: Jan. – May, 2023

Construction scope: Foundation construction for 18 sets of jackets

Remark: Locates in the sea area near Shapa Town, Yangxi County, Yangjiang, the OWF covers an area of 73.69km², and the mud elevation of -45~-48m. The distance from the OWF center to the shore is approx. 75km, which is till now the OWF project with the longest offshore distance in the offshore deep water zone in China.

The Offshore Crane “Hengtong 3500”

WTG Installation References (selected)

Zhejiang Energy Taizhou I OWF WTG Installation

Construction time: Mar., 2023 - Now

Construction scope: Installation of 20 nos. of 7.5MW WTGs

Remark: It is the first OWF project that “Hua Dian Wen Qiang” is involved in after its upgradation. The project is also a significant OWF project by Zhejiang province during the 14th Five-year Plan. The impeller lifting process was applied, with an impeller diameter of 208m, which is currently the largest diameter that we adopt for impeller lifting.

The Platform “Hua Dian Wen Qiang”

Global Presence of Submarine FOC

Total length of submarine FOC delivered: **100,000+km**， International projects: **135+**

Asia
57 projects

Africa & ME
32 projects

America
21 projects

Europe
18 projects

Trans-ocean
7 projects

Summary of Wet Plant Products Delivery

Hengtong has delivered over 1100+ wet plant products, containing **repeaters, branching units and ROADM units**. They have been deployed for **30000+** months **0 FAILURE** in service.

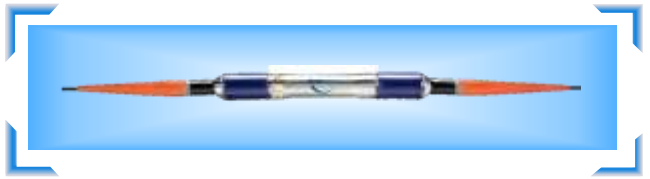
*Sum of each wet plant in service time

Length and Percentage of repeatered systems

71000+km

Repeatered system

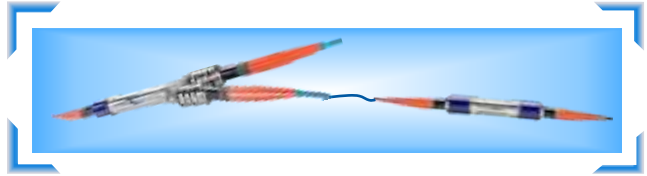
Number of repeaters in service



800+

Repeaters in service

Number of Branching unit and ROADM in service



180+

BU and ROADM in service

and **120+** other wet plant products

Typical Submarine FOC Projects

Project location: **volcanic area**

Comoros Project

The world's **southern-most** cable project

FOA Project

Application:

48G.654D(125um^2)

Megacable Project

Across Asia, Africa and Europe (Over **20,000km**)

PEACE Project

16 fps SDM repeatered cable system

Hainan-HK Project

Maldives Project

Single span (conductive) without joint: **318km**

Bolivia IGW Project

Max deployed water depth: **6,850m**

PNG Project

Systems length: **5,457km**

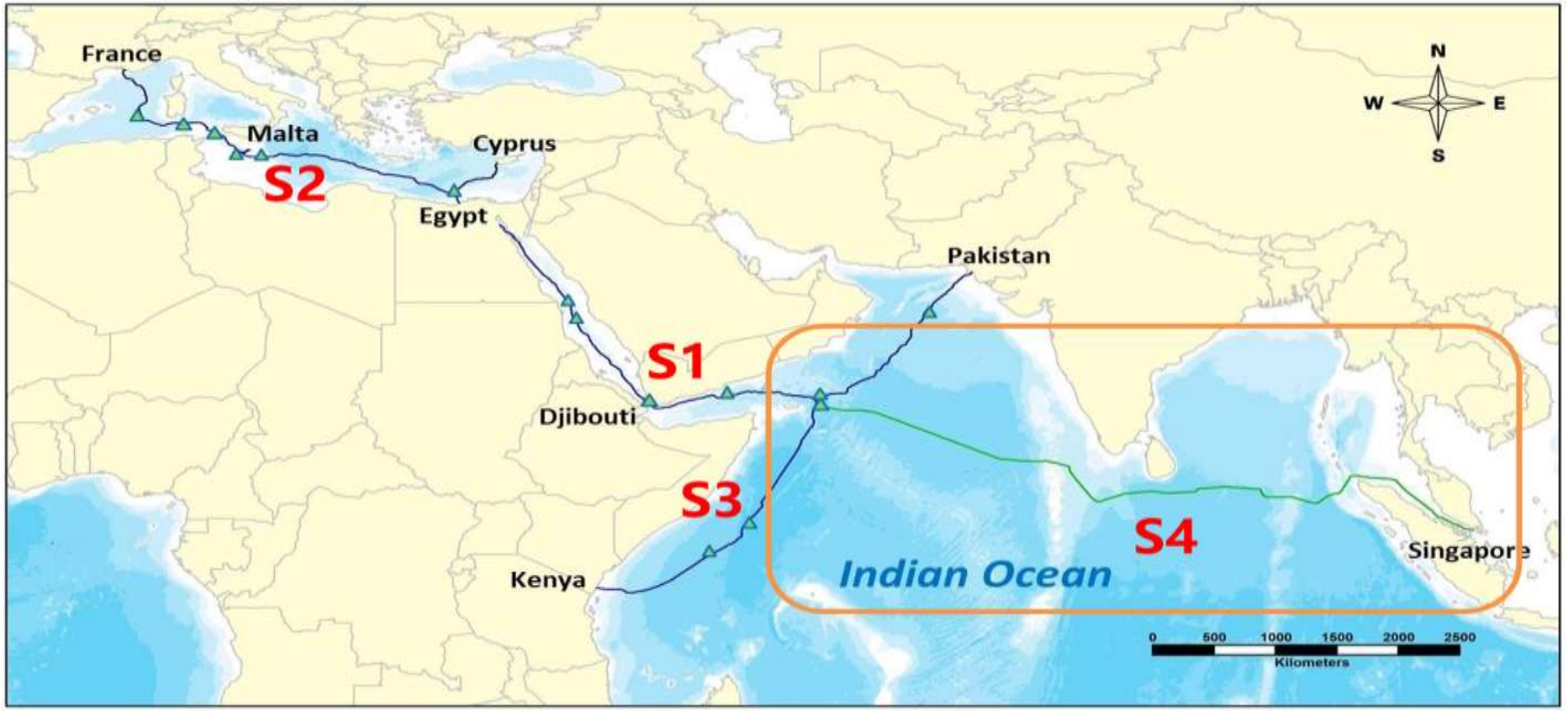
SCIP Project

Intra-Asia High fiber count cable project over **1,000km**

SIGMAR Project

System length: **2,200km**

PEACE Project



Full Name: Pakistan & East Africa Connecting Europe

- Total Length: **> 13,000KM**
- Providing wide coverage and ultra low internet latency to landing countries & regions, and partners along the route in Asia, Africa, and Europe

PEACE Project – to Highlight

- One of the largest submarine cable network infrastructure in the world
- Connected three largest continents with the most population, i.e., Asia, Africa & Europe
- Support customized cooperation solutions to provide a more flexible choice
- No restrictions on participants, providing neutral and convenient interconnection services

International Talents

Michael Chang

CTO Submarine Cable & System

Graduated from Xi 'an Jiaotong University, majoring in electrical engineering. Worked in Nexans (France, China) for 20 years, responsible for submarine cable system engineering, marketing and project management.

Eduard Estrada Boix

Deputy General Manager of HENGTONG IBD

With more than 15 years of experience in international submarine cable project management, marketing and contract negotiation, Edward served as offshore wind project manager in Nexans and NKT before.

Jerry Brown

International Submarine Optic Cable Expert

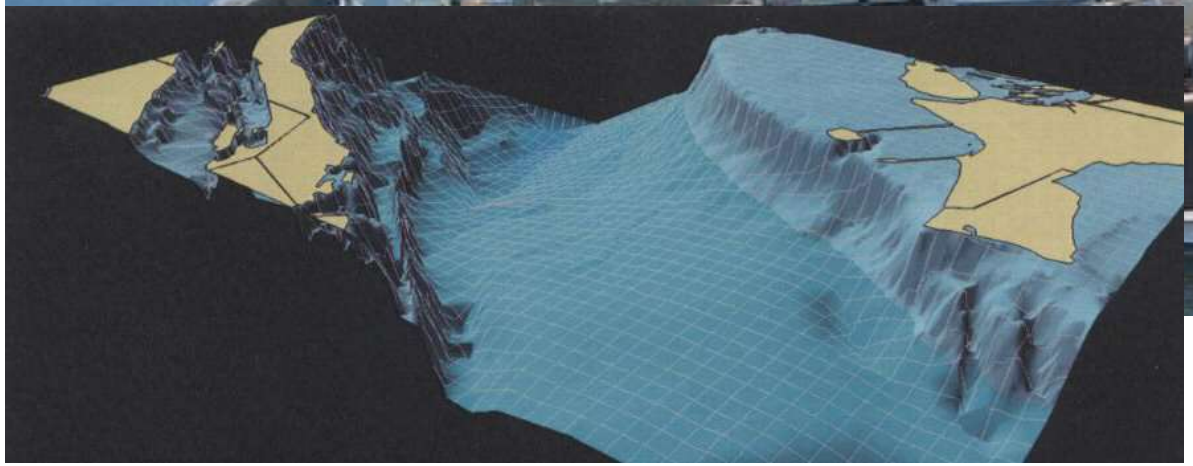
A well-known expert in the international submarine optical cable industry, 40 years of experience in the R&D of submarine optical cable systems. He has worked in Alcatel. State Council Allowance Chinese Government Friendship Award.

Zenchi Shiotani

Offshore Engineering Director

Shiotani has worked in international high voltage cable engineering for more than 40 years, and owns more than 10 patent technologies of cable laying technology. He has worked in Sumitomo for 40 years. Over 100 large and small Marine cable projects have been implemented.

Canada-Vancouver Island 230kV Connection

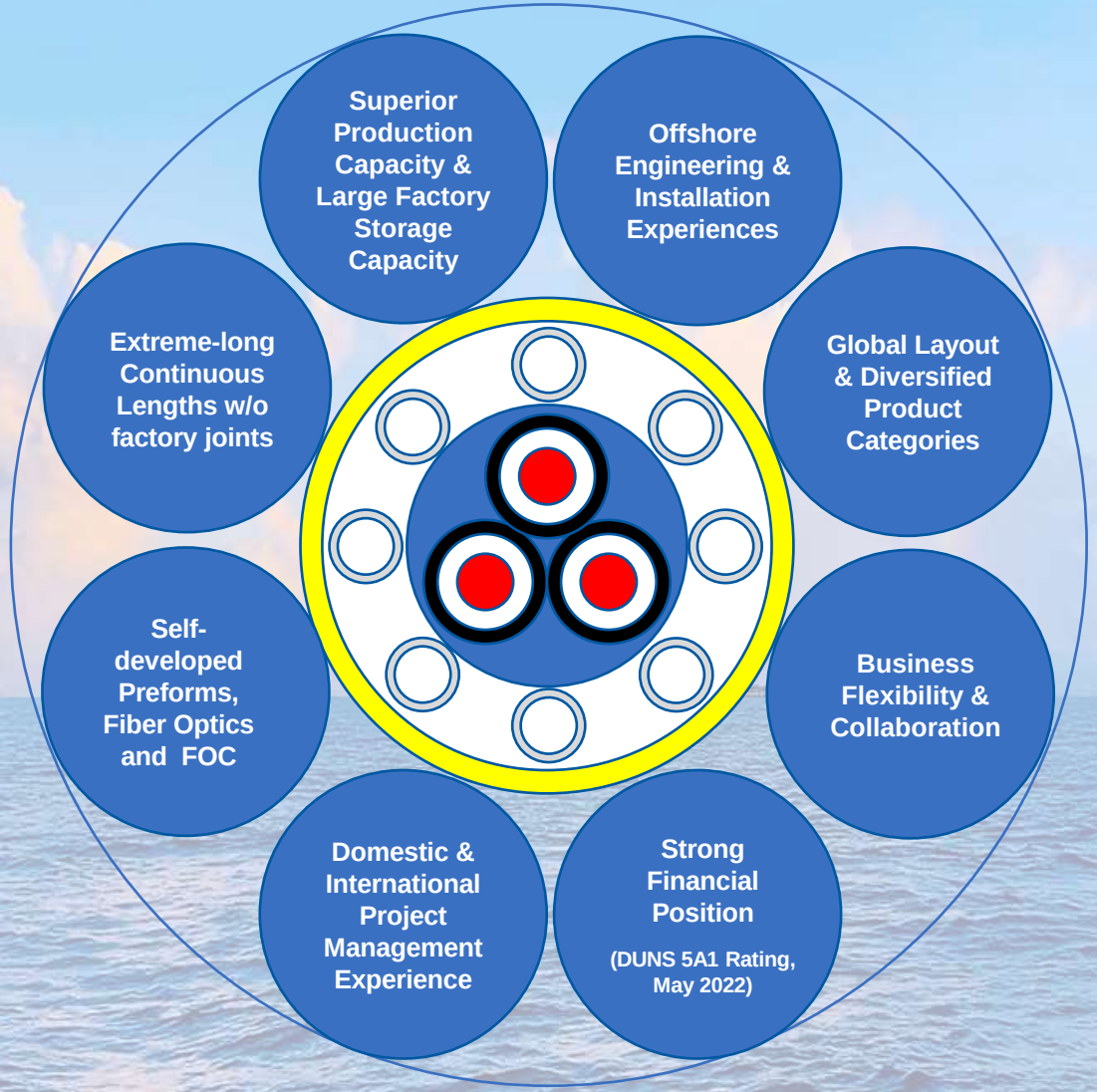


- Number of Circuits: 1
- Supply Length: 84km
- Rated Current: 1,506A (600 MW)
- Year of Installati8on: 2009
- Max. Water Depth: 200m
- Burial Depth: Surface lay
- Method of Burying: -
- Customer: BCTC
  (British Columbia Transmission Corporation)
- Location: Vancouver Island (Canada)

Shiotani Zenchi

Cable:
230 kV 1 × 1,600mm^2
FF Submarine Cable (PPLP)
Single Wire Armoured
with Return Conductor
Overall Dia. = 142 mm
Weight = 61.1 kg/m

The Strengths of Hengtong



COPORATE SOCIAL RESPONSIBILITY

CHARITY ACTIVITIES

Clients & Partners Worldwide (partial)

& looking forward to see you there…

Win-Win Cooperation

To build a global energy interconnection solution provider

Thanks!