Study Committee B1

Insulated cables

10292_2022

Development of Economic and Environment-friendly 66kV Array Cable

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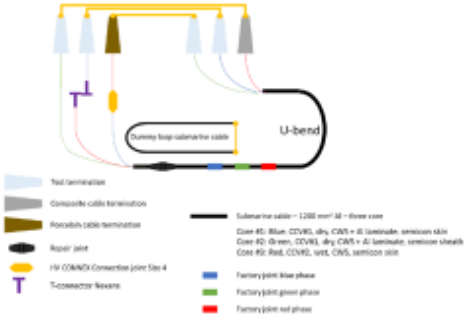
Introduction

- Offshore wind power has become a trend due to the global megatrend of clean energy.
- Due to economic considerations, the capacity of wind turbines is getting larger and larger, and 66kV has become the mainstream of offshore wind power array cable in Europe and the world in future



Test Loop & Components

- **Cable** 3x1200mm^2 Al submarine cable with 3 different metallic screen types:
  - ✓ **Blue, CCV#1, dry type, CWS+Al laminate, semicon skin**
  - ✓ **Green, CCV#1, dry type, CWS+Al laminate, semicon sheath**
  - ✓ **Red, CCV#2, wet type, CWS, semicon skin**
- **Accessory** Outdoor termination (Pfisterer, Sanyuan), Dry type joint (Pfisterer CONNEX/SEANEX), T-connector (Nexans), Repair joint (Hengtong)

Standard

- **Standard** IEC 63026: 2019 for type test
- **Standard** Cigre TB 722: 2018 for wet dielectric qualification test

Conclusion

- The type test complied with the requirement of IEC 63026: 2019
- The wet dielectric qualification test (regime A) complied with the requirement of Cigre TB 722: 2018

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Conductor

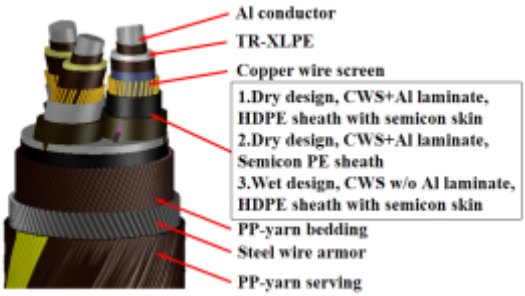
- Aluminum conductor (class 2)
- Water blocking tape/compound
- Max. 2000mm^2 (1200mm^2 type tested)
- **Lighter and cheaper**

Insulation

- TR-XLPE (DOW)
- Maximum allowed electrical field strength at the conductor screen is <8 kV/mm
- Maximum allowed electrical field strength at the core screen is <4 kV/mm
- Type test report covers CCV#1 and CCV#2
- Pass the wet dielectric qulification test (**wet type can be applied**)

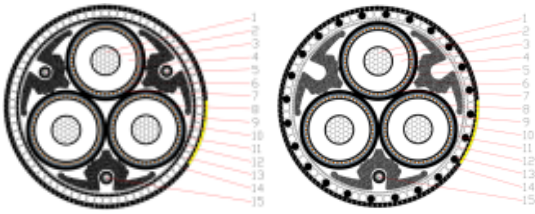
Metallic screen and core sheath

- Three different designs
- ✓ **Blue, CCV#1, semi-dry type, CWS+Al laminate, semicon skin**
- ✓ **Green, CCV#1, semi-dry type, CWS+Al laminate, semicon sheath**
- ✓ **Red, CCV#2, wet type, CWS, semicon skin**
- **More environment friendly**



Armour

- Galvanized steel wires
- Common stainless steel wires
- Galvanized stainless steel wires
- Hybrid galvanized steel wires (with PE wires)
- Hybrid stainless steel wires (with PE wires)
- **Adapt to various environments**



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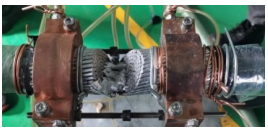
Alumimun factory joint

- Welded layer by layer
- V groove welded



Offshore flexible repair joint

- Recover the armour with different steel wires (galvanized steel wires and stainless steel wires)
- Suitable for environments where different wires are required due to different laying conditions

Coiling test

- The coiling and rewinding process: 5 times
- The test diameter: 8.5 m
- The drop height: 20.0 m
- **Cable can be coilable (Basket is available)**

Conclusion

The new economic and environment-friendly 66kV offshore wind array cable developed can fully meet the requirements of the global offshore wind power market in the future and provide a novel solution for the energy conservation and cost reduction of future offshore wind farm project.