





Outdoor switchgear 110 kV

Rotary Cable

Cryostat 300 m HTC Cable Line 2400 m

Terminal Joint 20 kV

Measuring

Compresso

Table

Study Committee B1

Insulated cables 10359 2022

Development, Adjustment and Implementation of the HTS Transmission Cable Line (2.4 Km) in St. Petersburg

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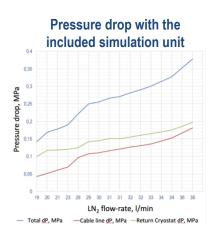
"R&D Center @ FGC UES", Russian Federation

Connection

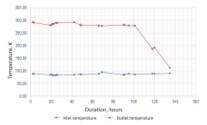
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85

Joint Cable Tables



HTS DC cable line cooling with gaseous nitrogen

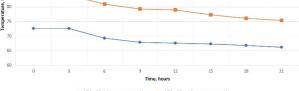


Unit Case Case

Full line assembly layout

Direct line

Cryogenic system LN2 Load Point Station



Conclusion

- Full-scale HTS DC cable line operability was demonstrated
- Modes of initial cooling and temperature stabilization along the full length of the cable line were determined
- Electrical characteristics of full cable lint length assembly correspond to 860 m tests results obtained in 2018
- Normal and maximum operating modes of Cryogenic system the HTS cable line together with all auxiliary equipment were determined



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Development, Adjustment and Implementation of the HTS Transmission Cable Line (2.4 Km) in St. Petersburg

Key results of thorough upgrade of cryogenic system

Helium-nitrogen heat exchangers thermal power





Cryo-system cooling capacity





Cooldown time



- ✓ Repair kits for cryostats
- Complete automation of cryo-system
- ✓ Comprehensive boundary tests of HTS cable line full assembly
- ✓ Integrated means of thermal deformations compensation

Nitrogen demand for cooling down













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Development, Adjustment and Implementation of the HTS Transmission Cable Line (2.4 Km) in St. Petersburg

Ongoing construction works and implementation of HTS cable line

