

# Treatment of Offshore Generation Connections

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Charging Issues Standing Group  
27 September

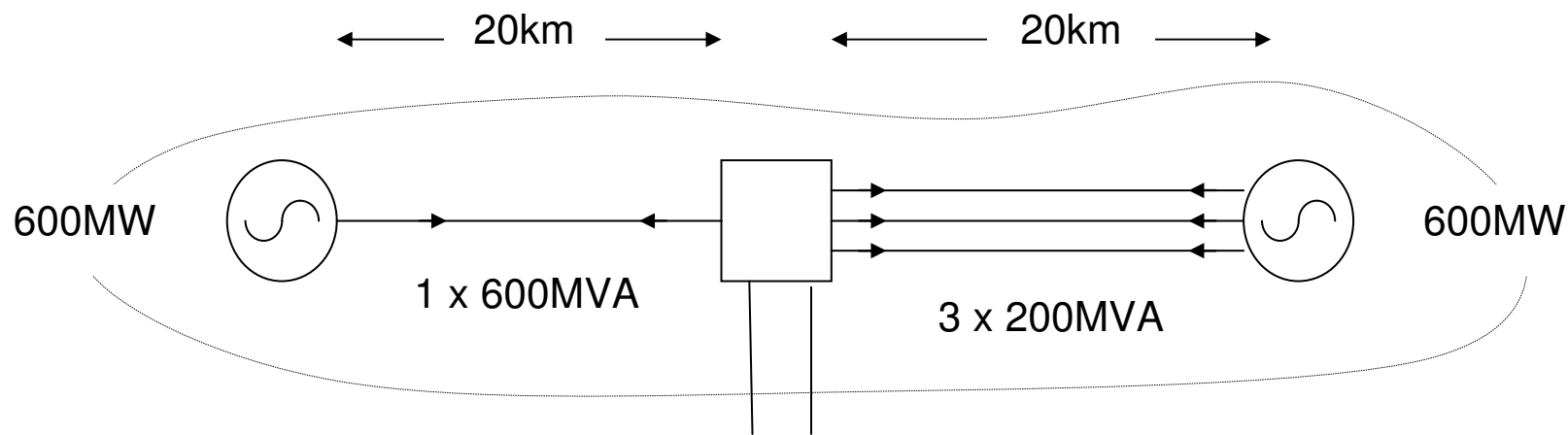
# Cable expansion factors

- ◆ Marine cable expansion factors to be calculated for DCLF model
- ◆ A number of variables:
  - ◆ AC or HVDC
  - ◆ Operating voltage
  - ◆ Load rating (mm<sup>2</sup> of copper)

Cable (mm <sup>2</sup> copper)	132kV (500)	132kV (1000)
Load capacity /MVA	169	217
Annual Cost £k /km	35	49
Annual Cost £/ MVAkm	208	227

- ◆ Trade off between complexity and cost reflectivity

# Multiple Cables – No Redundancy



	<b>3 x 200 MVA</b>	<b>1 x 600 MVA</b>
Operating Voltage	132 kV	245 kV
Cable Expansion Factor	17	12
Marginal Length of Circuit (km)	340	240
Security Factor	1.64	1.68
TNUoS Tariff (£/kW)	28.03	27.03
TNUoS Cost Differential	£600k p.a.	
Actual Annualised Cost Differential	£604k p.a.	

# Converter Station Costs

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- ◆ Converter station assets dedicated to circuit
  - ◆ Cost reflective to include into expansion factor
- ◆ Cost of HVDC converter station assets four times greater than AC circuit equivalent
  - ◆ HVDC: £330 / kW