



WETS'11 Complementary Questionnaire
Specific problems posed by DC
World Energy Transmission System

Achievement and experience in service of long length (>10km),
HV, EHV and UHV electric links by AC and DC insulated power cables

*The results of the survey for WETS'05 / WETS'07 are available on the site jicable.org
pages workshops WETS'07 & WETS'11
See also WETS'07 CDRom*

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1 - Space Charges

1.1 - What kind(s) of problem(s) due to space charges could happen, considering the type of technology of the convertor (VSC or LCC)?

1.2 - How to analyse space charges measurements and how could be used the results of these analyses ?

1.3 - How can be defined a main and global method for measuring space charges on a DC system (cable and accessories):

1.3.1 - . Under-voltage measures (under-current measures ?),

1.3.2 - Importance of the insulation layer thickness, considering the type of insulation when applying the measuring method.

1.4 – How could we manage issues created by space charges, at the interfaces inside premoulded joints ?

1.4.1 - Which methods do exist for justifying/explaining the considerations taken for the design of the premoulded joint (especially for the quantification and the management of the electric field at the interfaces) ? Within this list of methods, which one should be chosen as a reference ?

1.5 – Reflexions and knowledges about degassing process : what are the impacts of these process on the dielectrical performances of the insulation?

1.6 – Voltage decay and rise: how can be used this kind of method to check the conditions of insulation ? What are the impacts of voltage decay and rise in relation to the security of stakeholders ?

1.7 – What is life expectancy of a DC extruded system ? Is a R&D program needed ?

2 - DC Systems (Cables and Accessories)

2.1 – Prospects of DC cables: which technologies (MI, XLPE), which range of power... ?

2.2 – Capabilities of a DC system to work both in AC and DC : can an AC link be used in DC ? and vice versa.

Is it an attractive possibility to use an extruded AC cable as a DC cable several years after its commissioning?

Skin and proximity effects,

Non linear system,

Charged insulators,

B1.11 works.

2.3 – When designed, what are the matches in voltage, if there are any, between AC and DC synthetic insulated cable?

- Gradient and temperature (overload temperatures are different in AC and DC).

2.4 – Which are technologies of joints to be used for DC : taped (Taped Joint TJ or Tape Moulded Joint TMJ), prefabricated PFJ (composite or premoulded), moulded on site (Extrusion Moulded Joint EMJ) ?

2.5 – Quality, ageing and life expectancy of the insulator :

- Distribution of the electrical field in the insulator: which model to choose ?

- Life expectancy of a DC extruded system ? Is a R&D program needed ?

2.6 – Electrical design of links by using several dipoles in parallel.

2.7 – Design of outdoor sealing ends (creepage distances) and GIS (maintenance), pollution withstand of the insulator used in DC: which are favourite technologies to be used ?