



## **WETS'11 QUESTIONNAIRE**

*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](http://jicable.org)  
pages workshops WETS'07 & WETS'11  
See also WETS'07 CDRom*

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Concerning this questionnaire:

Part 1 is about AC Links

Part 2 is about DC Links

Part 3 is for both cases

Date

# 1 - Deepening of issues addressed at WETS'07 on insulated power cables AC links

## 1.1 - Geographical situation of this AC link :

Country:

Area:

## 1.2 - Characteristics of the link :

Network:

Link name:

Nominal power (MW):  Nominal voltage (kV):

Link length (km):  Number of circuits:

## 1.3 - Characteristics of the cables :

Cable type :

Cable manufacturer :

Installation :

Other installation details,  
embedding depth, cable  
protection

Forced cooling ?

YES

NO

Cooling  
Type :

Insulating material?  
polymer, paper,...

Metallic screens bonding :

Lineic inductance :

Lineic capacitance :

Testing of the link (before  
commissioning, and  
during operation) :

#### 1.4 - Is a compensation of the reactive power achieved?

YES Why? :

NO

Position of the  
compensation,  
- at the end,  
- intermediary?...  
Why?

#### 1.5 – Characteristics of the compensation :

Nominal power (Mvar) :

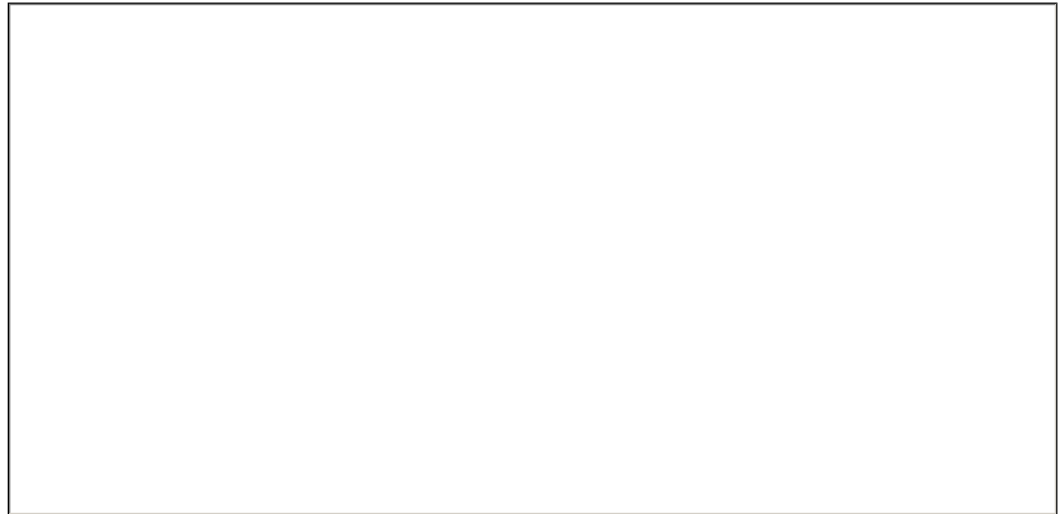
Technology :

Cost (€ or US\$) :

Occupied space (m<sup>2</sup>) :


## 1.6 - How are considered the problems of cable integration into the system?

- Stability of voltage and frequency?
- Propagation of slow transients, resonances:
- Distribution of currents related to the different impedances:



## 1.7 - Operating results of the compensated link :

Technical and economic performances :



## 1.8 - Publications or available documents concerning this link :

References of the documents :



## 2 - HV, EHV and UHV insulated power cables DC links

### 2.1 - Geographical situation of this DC link :

Country :

Area :

### 2.2 - Characteristics of the link :

Network :

Link name :

Nominal power (MW) :

Nominal voltage (kV) :

Link length (km) :

Number of circuits :

### 2.3 - Characteristics of the cables and accessories :

Cable type :

Manufacturer :

Installation :

Other installation details,  
- embedding depth,  
- cable protection...

Forced cooling ?

YES

NO

Cooling Type:

Insulating material : Polymer, paper, ...

Characteristics of the accessories :

Testing of the link (before commissioning, and during operation) :

#### **2.4 - Technical motivations ? :**

What are the reasons for choosing this technology?

#### **2.5 - Integration of the conversion station in the network**

What are the difficulties of integration of the conversion station in the network and the solutions (problem of protection of the link and of the network...)?

## 2.6 - Operating results of the link

DC link and converter?

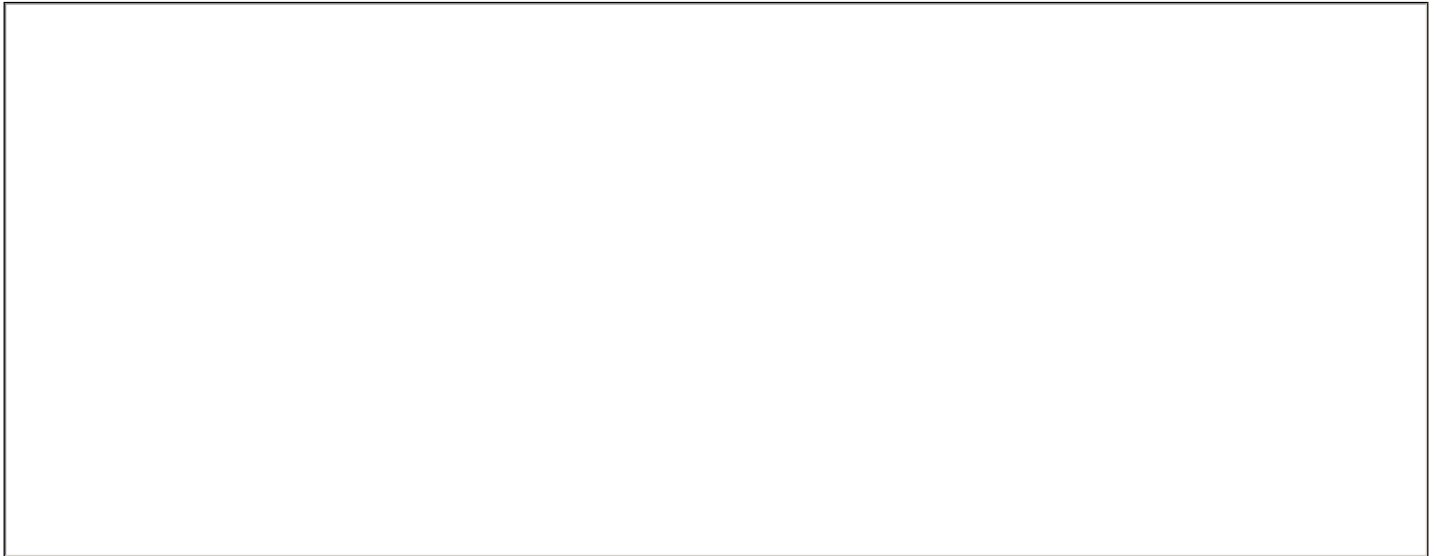
## 2.7 - Publications or available documents concerning this link :

References of the publications concerning this link :

## 3 - General issues concerning terrestrial or submarine insulated power cables AC or DC links

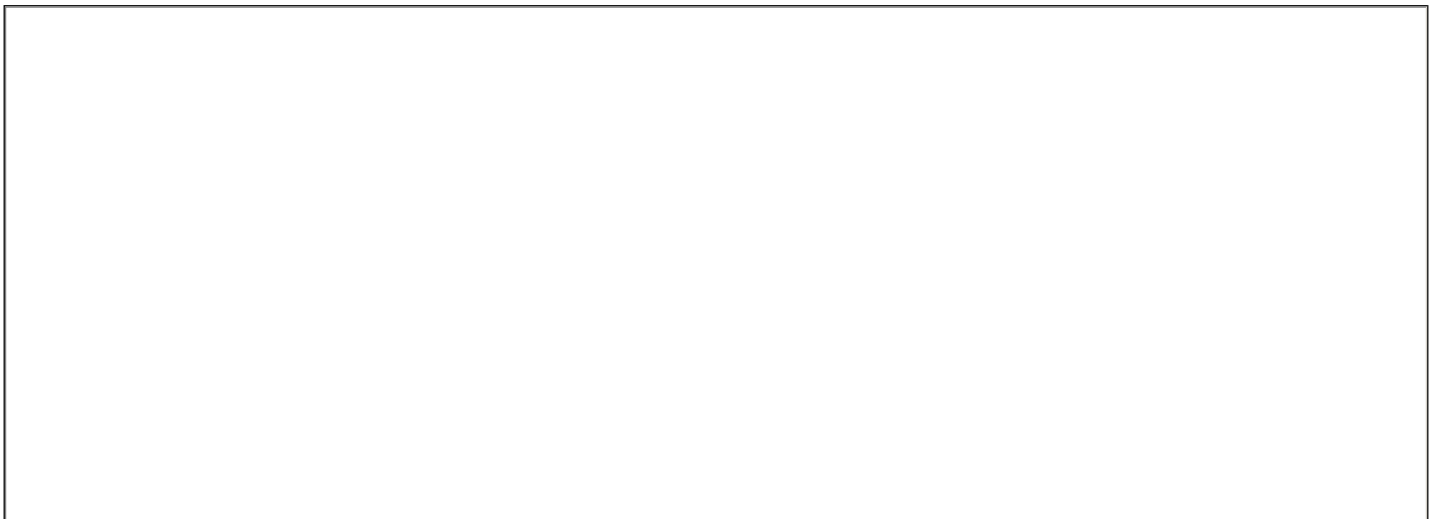
### 3.1 - Logistics issues :

What are the logistics of major projects and planning issues in particular in the case of tunnel (e.g., the problem of routing of large drums...)? :



### 3.2 - Failure rate?

What are the results of studies on the failure rate of these links taking into account the number of joints (elementary sections related to the capacity of drums). What is the estimated reliability of these links? What repairing solutions to reduce the duration of unavailability in case of failure ?





### 3.3 - Question for power utilities

How did react suppliers in terms of availability and responsiveness to the different phases: design, supply, repair ?

### 3.4 - Submarine link of 100 km and higher

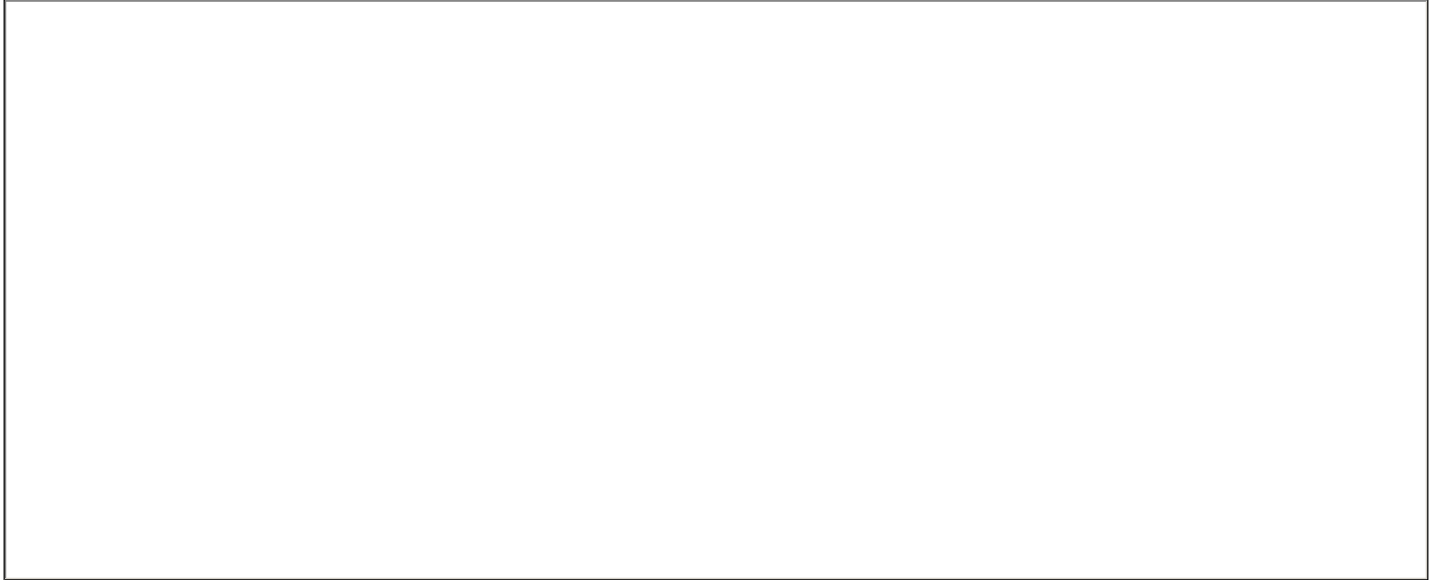
Are there any diagnostic methods for assessing the health status of a submarine link of 100 km and higher?

### 3.5 - Acceptance test

What are the acceptance tests for significant long length links?

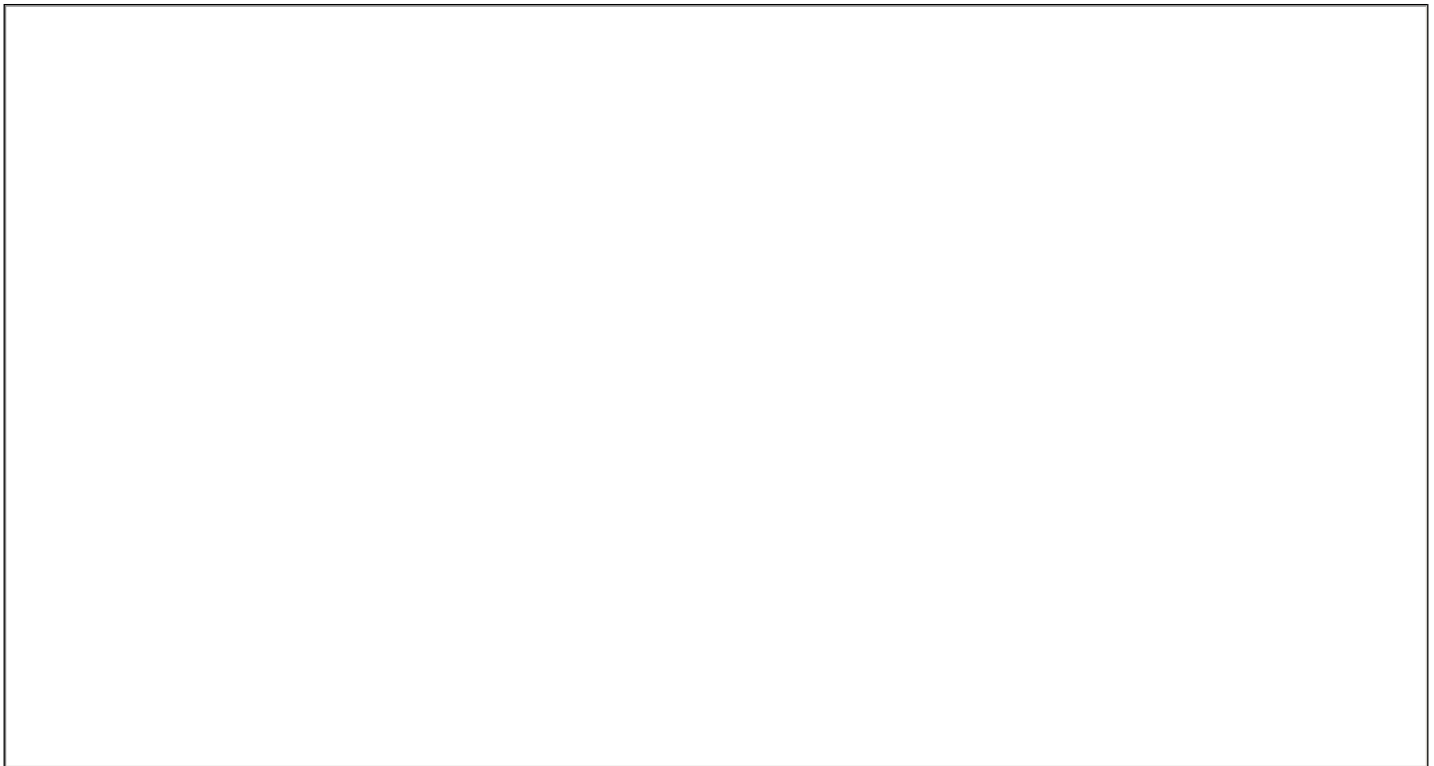
### 3.6 - Links with three ends

What are the technical solutions to realize links with three ends?

A large, empty rectangular box with a thin black border, intended for the user to provide technical solutions to the question above.

### 3.7 - Investment costs

What are the estimated costs of the investment and operation of these links (detail if possible the distribution of these costs to the supply, installation work , assembly / test, operation)?

A large, empty rectangular box with a thin black border, intended for the user to provide estimated costs and their distribution for the links.