CIGRE Study Committee B1

PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP (1)

WG* N° B1.51	**Name of Convenor :** Paolo MAIOLI (Italy) **E-mail address**: paolo.maioli@prysmiangroup.com
Technical Issues # (2): 9	**Strategic Directions # (3): 2, 3**
The WG applies to distribution networks (4): Yes / ~~No~~	
Title of the Group: Fire issues for insulated cables installed in air	

Scope, deliverables and proposed time schedule of the Group :

Background :

A significant concern is the fire safety of insulated cables installed in air, since it is often not practical for fire protection services to give a rapid response in case of fire. This subject has been raised in the Technical Brochure 403 “Cables Systems in multipurpose or shared structures”. Whilst it is possible to bury some of the more hazardous cables in the floor of the tunnel, provide protection barriers or install fire protection systems such as water sprays or other devices, these systems are all expensive. It was therefore important to establish if more suitable cable designs could provide an adequate level of fire protection without the need for separate protection systems.
Quite often tunnels are “ventilated” with certain airflow, having an incremental effect on some of the typical fire behavior of cables, including fire propagation, development of smoke and to a lesser extend development of corrosive fumes
Standardizing work was done by IEC, but in terms of fire behavior these standards, at present, are mainly applicable to low voltage cables. More recent developments of new designs and requirements of power cable systems in terms of flame retardant properties are not yet considered; for this reason it is difficult to apply the above mentioned standards to transmission and distribution.

Scope :

1. To review:
   - All existing international and national standard, any work done by CIGRE, CIRED, IEC, IEEE.
   - Extent of service experience, customer needs; so far for different connector types.
   - Papers presented at Conferences (e.g. Jicable).
   - Customer needs.
2. To analyze:
   - Type of Installation: single purpose (tunnel, substations) or multi-purpose (bridges, shared tunnels and other shared civil works)
   - Ancillary components like fire monitoring, sprinkler protection, barriers, and other control measures could be the object of a list of general rules/suggestions and civil works (improvements, arrangements) as well.
   - In addition, the effect of certain mitigation measures on the performances of cable (i.e.: current rating) should be considered.
   - As a final contribution, the WG could provide for a ranking of cables types/design in relation to fire risk.
3. To propose:
   - Suitable cable designs
   - Additional methods
   - Development Tests, Type Tests including Fire Tests.

4. To consider the whole range of cables from MV to EHV, mainly with extruded insulation, excluding joints; 5. To prepare only general rules for joints installation. **Deliverables :** Technical brochure with summary in Electra and tutorial **Time Schedule** : start : 2015 **Final report** : 2017
Comments from Chairmen of SCs concerned :
Approval by Technical Committee Chairman : **Date** : 06/02/2015

(1) Joint Working Group (JWG) - (2) See attached table 1 – (3) See attached table 2
(4) Delete as appropriate

Table 1: Technical Issues of the TC project "Network of the Future" (cf. Electra 256 June 2011)

1	Active Distribution Networks resulting in bidirectional flows within distribution level and to the upstream network.
2	The application of advanced metering and resulting massive need for exchange of information.
3	The growth in the application of HVDC and power electronics at all voltage levels and its impact on power quality, system control, and system security, and standardisation.
4	The need for the development and massive installation of energy storage systems, and the impact this can have on the power system development and operation.
5	New concepts for system operation and control to take account of active customer interactions and different generation types.
6	New concepts for protection to respond to the developing grid and different characteristics of generation.
7	New concepts in planning to take into account increasing environmental constraints, and new technology solutions for active and reactive power flow control.
8	New tools for system technical performance assessment, because of new Customer, Generator and Network characteristics.
9	Increase of right of way capacity and use of overhead, underground and subsea infrastructure, and its consequence on the technical performance and reliability of the network.
10	An increasing need for keeping Stakeholders aware of the technical and commercial consequences and keeping them engaged during the development of the network of the future.

Table 2: Strategic directions of the TC (cf. Electra 249 April 2010)

1	The electrical power system of the future
2	Making the best use of the existing system
3	Focus on the environment and sustainability
4	Preparation of material readable for non technical audience