CIGRE Study Committee C4

PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP

WG* N° C4.39	**Name of Convenor : Kenji Tsuge** (Japan) **E-mail address**: k-tsuge@ngk.co.jp
Technical Issues # (2): 10	**Strategic Directions # (3): 2, 4**
The WG applies to distribution networks (4): No	
Title of the Group: Effectiveness of line surge arresters for lightning protection of overhead transmission lines	

Scope, deliverables and proposed time schedule of the Group :

Background :

Line surge arrester using metal-oxide resistor is a well-proven technology for lightning protection of overhead lines, and its application to transmission lines significantly expanded in some countries according to the social demand for power supply quality against lightning. Based on the successful experience with a particular design concept and testing technology, IEC standard for externally gapped metal-oxide line surge arresters (EGLA) was established in 2011. Other types of line surge arresters are also successfully applied in service, such as metal-oxide gapless line surge arresters (NGLA).
Recent studies on lightning characteristics and the parameters such as flash density, peak current, wave shapes, charge amount etc are applicable for analysis of lightning performance of overhead lines. Analysis tools such as specific software packages including EMTP (Electro-magnetic Transients Program) are becoming more popular such that analytical practice to evaluate this performance is now in widespread use.

Scope :

1. Summarize field experiences of lightning protection performance with EGLA, NGLA and other types of line surge arrester. Compare the performance and effectiveness of shield wires alone versus the addition of arresters.
2. Introduce useful analytical approaches to evaluate the lightning protection performance of transmission lines with line surge arresters and address the important issues for effective application of line surge arrester.
3. Identify requirements for line surge arrester against lightning stress in terms of energy dissipation, peak current and electrical charge.
4. Identify how can lightning detection systems be used effectively and efficiently for determining the need for and application of arresters.

Since this subject of interest to SC B2 as well, SC B2 will nominate up to two (2) experts to participate as active members of this WG and to coordinate and act as liaisons between this group and SC B2.

Deliverables : Report to be published in technical brochure with summary in Electra

Time Schedule : start : April 2015 **Final report** : 2017

Comments from Chairmen of SCs concerned :

Approval by Technical Committee Chairman : M. Wald

Date : 10/12/2014

(1) Joint Working Group (JWG) - (2) See attached table 1 – (3) See attached table 2

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