CIGRE Study Committee C4

PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP

WG* N° C4.23	**Name of Convenor :** Christiaan Engelbrecht (Netherlands) **E-mail address**: c.s.engelbrecht@ieee.org
Technical Issues # [(2)]: 9	**Strategic Directions # [(3)]: 2**
Title of the Group: GUIDE TO PROCEDURES FOR ESTIMATING THE LIGHTNING PERFORMANCE OF TRANSMISSION LINES	

Scope, deliverables and proposed time schedule of the Group :

Background :

Lightning remains one of the main causes of outages on transmission lines even though it has been studied extensively since the beginnings of power transmission. Over the years several approaches has been formalized to aid transmission line designers to optimize their line designs with respect to its lightning performance. Important landmarks in the development of procedures for estimating the lightning performance of transmission lines are:

- 1982: Publication of a step-by-step simplified method for hand or programmable calculators by EPRI
- 1985-1997: Adoption and refinement of the EPRI simplified method by the IEEE which has subsequently been published as the IEEE standard 1243.
- 1991: Publication of the CIGRE Brochure 63 “Guide to procedures for estimating the lightning performance of transmission lines”

Since then there has been significant progress in lightning research and the understanding of lightning attachment to transmission line structures through continued research and many countries have now lightning detection networks which provide detailed information on lightning occurrence. Moreover, modern personal computers provides sufficient computing power to allow for sophisticated modeling of the interaction of lightning with transmission line structures, thereby reducing the need for simplified methods.

Scope :

The revision of the CIGRE brochure 63 “Guide to procedures for estimating the lightning performance of transmission lines” to modernize the information and to describe the latest techniques and assumptions used to calculate the lightning performance of overhead transmission lines. In addition the brochure will include a collection of application examples to serve as benchmarks and to allow for a sensitivity analysis of the selected modeling techniques/parameters.

Deliverables : A Cigre technical brochure with summary in Electra

Time Schedule : start : January 2012 **Final report** : 2015

1) First year: Survey of lightning parameters, calculation methods and input assumptions.
2) Second year: Consolidating of the collected data and the formalization of the Cigre guidelines
3) Third year: Producing an brochure summarizing the above with a final report to be submitted by August 2015

Comments from Chairmen of SCs concerned : B2 is certainly participating. B1 is participating as far as cables are concerned.
Approval by Technical Committee Chairman : Klaus Fröhlich **Date** :13/06/2012

(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	Interactive communication with the public and with political decision maker