

CIGRE Study Committee C4

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

WG* N° C4.28	Name of Convenor : François Deschamps (France) E-mail address: francois.deschamps@rte-france.com	
Technical Issues # (2): 8,9	Strategic Directions # (3): 3,4	
The WG applies to distribution networks (4): Yes		
Title of the Group: Extrapolation of measured values of power frequency magnetic fields in the vicinity of power links		
<p>Background :</p> <p>In the past few years, important works have been conducted within CIGRE SC C4, aiming at characterizing ELF magnetic fields (TF C4.205) and improving measuring techniques (TF C4.203). Nevertheless, magnetic fields measurements (even when following the best recommended practices as established by CIGRE) are only a limited sample, a “photography” of the magnetic environment at a given time.</p> <p>As a matter of fact, measurements are not sufficient to describe all the characteristics of magnetic fields with regard to human exposure. In practice, the question often raise about the meaning of measured values, and their adequacy to describe or define the “real” level of exposure. Therefore, a “post-processing” of the measured values is often needed to offer a more complete answer to the question of the exposure of people neighboring power lines. This means that measured values have to be extrapolated to other values which are supposed to be more relevant in characterizing people’s exposure to EMF. The first question is therefore to determine the relevant reference value(s) of the current flow: in addition to general considerations developed by CIGRE TF C4.205, particular cases such as mixed overhead/buried lines have also to be considered.</p> <p>Moreover, even if the magnetic fields is directly related to the current flowing in a power line, the extrapolation is simple only when the line configuration is simple (i.e. single circuit lines) and when its geometry does not change with its temperature (such as for buried cables). In the contrary, there are many situations where a simple linear extrapolation based on values of flowing currents would result in important biases, such as double circuit overhead lines with different currents in the circuits, or “low” overhead lines, for which the sag variation due to the increase of the conductors temperature must be taken into account.</p> <p>Scope :</p> <ol style="list-style-type: none"> 1. To discuss the possible values of the current flow to be used as reference for extrapolating measured values of power frequency magnetic fields 2. To propose different extrapolation methods applicable to simple (single buried lines) or complex (multiple circuits) configurations. 3. To assess the various correction factors and uncertainties to be associated with the different extrapolation methods. <p>Deliverables : Report to be published in Electra or technical brochure with summary in Electra</p> <p>Time Schedule : start : August 2012 Final report : 2015</p>		
Comments from Chairmen of SCs concerned :		

Approval by Technical Committee Chairman : Klaus Fröhlich
Date : 13/06/2012

- (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	Interactive communication with the public and with political decision maker