



Study Committee C4

WORKING GROUP FORM (Terms of Reference)

WG No: WG C4.25

Name of Convenor: Harri Kuisti (Finland)

Title of the Group: Issues related to ELF Electromagnetic Field exposure and transient contact currents

Introduction:

Microshocks are electrical discharges that occur when a person in a high electric field comes close enough to another conducting object that is at a different voltage for a discharge to occur and for transient contact current to flow between the person and the object. In power line or substation work they can be controlled by good practices involving bonding or isolation. When microshocks experienced by general public sometimes become an issue it can be necessary to reduce electric fields locally.

Contact currents related to high electric field are addressed by the international recommendations (ICNIRP, IEEE) and more recently also by the European Directive on the EMF exposure of Workers (2004/40/EC), although they presently address only steady state contact currents. It is likely that transient currents will also be considered in future revisions of such guidelines.

Pacemakers and other implants are becoming more common. Interferences caused in them by high electric or magnetic fields can be lethal. Malfunctions appear to be rare but collecting information on cases related to ELF (Extremely Low Frequency) electromagnetic fields would be useful. Most studies concern steady state fields. Also the impact of microshocks on implants will need to be assessed based on data if available

Neither microshocks nor interferences of implants have been studied in detail by Cigré. There is a need to identify and provide guidance on how to mitigate microshocks and how to view the risks related to interferences of implants. Hence, there is a need to set up a WG addressing these items.

Scope:

The study will be divided in two parts. One will evaluate the importance and the waveforms of the different contact currents and recommend mitigation methods that can be used for different situations where high electric fields (AC, DC) occur in substations, on transmission towers and under overhead lines. The other part will address issues related to ELF electromagnetic fields and implants.

Deliverables and Proposed Time Schedule:

1) Assembly of Data and methods

- Form WG - September 2011
- Collect data and bibliography - March 2012
- Assessment of voltage and current amplitudes and waveforms for people exposed to high E field in different situations - August 2012
- Assessment of interference risks of pacemakers and other implants - August 2012
- Proposal of mitigating methods related to microshocks - March 2013
- Proposal of risk management practices related to interferences of implants - March 2013

2) Preparation of Guide

- First draft - February 2014
- Guide ready for publication as a Technical Brochure - July 2014

Other SC concerned by the work: SC B2, B3, C3

Approved by TC Chairman : Klaus Fröhlich

Date : 01/06/2011