CIGRE Study Committee D1

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

WG* N° D1.55	**Name of Convenor :** Michael Muhr (AT) **E-mail address**: muhr@tugraz.at
Technical Issues # (2): 3, 8	**Strategic Directions # (3): 1**
The WG applies to distribution networks (4): No	
Title of the Group: Partial discharge detection under DC stress	

Scope, deliverables and proposed time schedule of the Group :

Background :

Partial discharge (PD) detection and evaluation is an important tool for diagnosis of electrical insulation systems in high voltage equipment. Due to increasing use of DC voltages in electrical power transmission there is a need to investigate and characterize systematically the various techniques of measuring and evaluating PD signals under DC stress.

The topic is of high interest for application in R&D, quality control & verification, as well as for standardisation. The Chairman of IEC TC 42 “High-Voltage Testing Techniques” has expressed explicit interest that the subject will be studied by CIGRE.

Scope :

1. Assess the relevance of the current IEC parameter (IEC 60270):
   a. Specification of PD calibrators (repetition rate)
   b. Specification of the pulse rate dependent response of measuring instruments.
2. Definition of parameters applicable to measurement under DC stress:
   a. Pulse correlation: pulse counting, pulse magnitude, pulse to pulse interval
   b. Voltage correlation: inception and extinction, noise suppression
   c. Time correlation: PD patterns
3. Definition of procedures appropriate for measurement under DC stress:
   a. Noise suppression
   b. Interpretation rules
   c. Slope of voltage change, polarity reversal
4. Case studies

Experts from interested equipment and subsystem committees (e.g. A2, A3, B1, B2, B3, B4) are welcome to join the group.

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

Time Schedule : start : March 2013 **Final report** : 2015

Comments from Chairmen of SCs concerned :

Approval by Technical Committee Chairman : M. Wald
Date : 07/02/2013

(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