



CIGRE Study Committee D1

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

WG D1.60	Name of Convenor : Yi Li (AU) E-mail address: yi.li@measurement.gov.au
Technical Issues # ⁽²⁾: 6	Strategic Directions # ⁽³⁾: 1
The WG applies to distribution networks ⁽⁴⁾: Yes	
Title of the Group: Traceable measurement techniques for very fast transients	
Scope, deliverables and proposed time schedule of the Group : Background : Measurements of fast transient phenomenon are routinely performed for the purposes of equipment testing, system condition monitoring and system performance assessments. The very fast transient overvoltage (VFTO) is a major concern for equipments connected to high-voltage GIS. Efforts to determine the effects of VFTO on equipment require sufficiently accurate measurements of peak and time parameters of the transient pulses. There are also a number of IEC equipment standards that call for testing using fast transients, e.g. <ul style="list-style-type: none">- IEC 60034-15 (100 ns rise time with voltages up to 42 kV)- IEC 61211:2004 (200 ns rise time with voltages up to 500 kV)- IEC 61000-4-4 (5 ns pulses, up to 4 kV) VFTO measurements and testing according to the IEC standards are performed with various techniques and instrumentations (e.g. IEC/TS 61321-1). However, presently there are very limited reference measurement capabilities to meet the calibration requirements in this area. Hence uncertainties of measurements are often questionable, leading to indefensible test results. At the same time, calibration laboratories have been experiencing an increase of requests from industry for traceable calibrations in this area. In addition, IEC TC 42 has expressed interest that CIGRE studies this topic. Scope : <ol style="list-style-type: none">1. Identify parameters for performance evaluations (calibrations) that are relevant to requirements of present IEC standards and other industrial applications and identify common uncertainty components and their magnitudes.2. Literature survey of fast transient measurement techniques, not limited to, but relevant to high-voltage field, including hardware (dividers, probes) and digital algorithms.3. Coordinate development of suitable hardware and software for traceable measurement.4. Round-robin test of reference measurement systems (e.g., 100 kV, rise time 10 ns) Deliverables : Technical brochure, summary report in Electra and Tutorial Presentation. Time Schedule : start : January 2015 Final report : January 2018	
Comments from Chairmen of SCs concerned :	
Approval by Technical Committee Chairman :  Date : 26/09/2014	

(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