


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

WG* N° D1.65	Name of Convenor : Lars SCHMIDT (DE)	
Technical Issues # ⁽²⁾: -		Strategic Directions # ⁽³⁾: 1
The WG applies to distribution networks ⁽⁴⁾: Yes		
Title of the Group: Mechanical properties of insulating materials and insulated conductors for oil insulated power transformers		
Scope, deliverables and proposed time schedule of the Group :		
Background :		
<p>Materials and parts in power transformers are specified to withstand the various mechanical stresses that may occur during manufacturing and service (e.g. processing, transport, earth quakes, short circuit, thermal expansion, winding compression, etc.). Mechanical stresses on materials significantly depend on the design and application of a transformer. Mechanical stress during short-circuit is among the most critical stresses and Cigre Brochure 209 "Short circuit performance of transformers" gives a good description of these stresses.</p> <p>Many of the properties are well specified by standards, e.g. IEC 60641, IEC 60763 and IEC 61061, but the relation to real stresses is not always well understood. Moreover, the mechanical strength may change with time. The specified functional properties of the materials used in the insulation system and in the insulated conductors need to cope with the stresses which may occur during the production, transport and service life of a transformer. Furthermore, it should be avoided that materials are rated on parameters without significance for their function (over-specification).</p> <p>The required functional properties of materials and parts used in the winding and insulation system of transformers (e.g. cellulose materials parts, laminated parts and moulded parts and glued parts of the insulation system, and insulated conductors, e.g. bonded CTC wires) need to be reviewed and checked how they are reflected by the standards.</p>		
Scope :		
<p>Review to what extent the functional performance of materials for transformer insulation and conductor systems required in the present standards and test methods, are representative for the stresses occurring during manufacturing, transport and service.</p> <p>If necessary, the group should make suggestions on revisions and development of standards for materials and for testing of materials.</p>		
Deliverables : Technical Brochure, Summary Report in Electra and Tutorial Presentation.		
Time Schedule : start : 2016		Final report : 2019
Comments from Chairmen of SCs concerned :		
<p>Approval by Technical Committee Chairman : </p> <p>Date : 08/12/2015</p>		

(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