

**PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP <sup>(1)</sup>**

<b>WG* N° D1.53</b>	<b>Name of Convenor :</b> Lars Lundgaard (NO) <b>E-mail address:</b> lars.lundgaard@sintef.no	
<b>Technical Issues # <sup>(2)</sup>: 8</b>		<b>Strategic Directions # <sup>(3)</sup>: 1</b>
<b>The WG applies to distribution networks (4): Yes</b>		
<b>Title of the Group: Ageing of upgraded cellulose and cellulose impregnated in ester liquids and other liquids (Revision of Technical Brochure No 323)</b>		
<p><b>Scope, deliverables and proposed time schedule of the Group :</b></p> <p><b>Background :</b></p> <p>In 2007 CIGRE TB 323 on ageing of cellulose insulation in transformers was published. The brochure describes the materials and the ageing of insulation system in a generic way, but is superficial on describing performance of upgraded cellulose and does not cover ageing of cellulose impregnated with the new synthetic and organic ester liquids. In utilities there is a growing interest in these fields and new results have been published in recent years. <i>Therefore, it is proposed to revise the existing brochure.</i></p> <p>Some new research results are available on cellulose ageing in general.</p> <p>Thermally upgraded cellulose has been used predominantly in North America, but is becoming increasingly used worldwide. Different formulations are used and there is no standard procedure to evaluate the performance of thermally upgraded materials. There is a need to evaluate the specifications, formulations and performance of the upgraded cellulose and give recommendations to the end users and standardization bodies.</p> <p>Ester liquids have different chemical composition and physical characteristics from mineral oil (e.g. moisture absorbance). It is speculated that their use as impregnants may be advantageous for the cellulose ageing compared to mineral oils. The upgraded cellulose and new liquids will influence the diagnostic evaluation of the cellulose. The end users need unbiased information on these issues.</p> <p><b>Scope :</b></p> <ol style="list-style-type: none"> <li>1. Include new knowledge on cellulose ageing kinetics.</li> <li>2. Improve description of ageing kinetics and performance of thermally upgraded cellulose.</li> <li>3. Describe ageing performance of cellulose in other liquids than mineral oil.</li> <li>4. Revise chapter on ageing markers to reflect new knowledge.</li> </ol> <p><b>Deliverables :</b> Revision of TB 323 and updating of tutorial on cellulose ageing</p> <p><b>Time Schedule :</b> start : January 2013 <span style="float: right;"><b>Final report :</b> 2015</span></p>		
<b>Comments from Chairmen of SCs concerned :</b>		
<p><b>Approval by Technical Committee Chairman :</b> <b>Date :</b> 1<sup>st</sup> October 2012</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)**

<b>1</b>	Active Distribution Networks resulting in bidirectional flows within distribution level and to the upstream network.
<b>2</b>	The application of advanced metering and resulting massive need for exchange of information.
<b>3</b>	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.
<b>4</b>	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.
<b>5</b>	New concepts for system operation and control to take account of active customer interactions and different generation types.
<b>6</b>	New concepts for protection to respond to the developing grid and different characteristics of generation.
<b>7</b>	New concepts in planning to take into account increasing environmental constraints, and new technology solutions for active and reactive power flow control.
<b>8</b>	New tools for system technical performance assessment, because of new Customer, Generator and Network characteristics.
<b>9</b>	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.
<b>10</b>	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)**

<b>1</b>	The electrical power system of the future
<b>2</b>	Making the best use of the existing system
<b>3</b>	Focus on the environment and sustainability
<b>4</b>	Preparation of material readable for non technical audience