

**CIGRE Study Committee B1**

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

<b>WG* N° B1.43</b>	<b>Name of Convenor :</b> Marc Jeroense (SWEDEN) <b>E-mail address:</b> marc.jeroense@se.abb.com	
<b>Technical Issues # (2): 9</b>		<b>Strategic Directions # (3): 1</b>
<b>The WG applies to distribution networks (4): Yes</b>		
<b>Title of the Group:</b> Recommendations for mechanical testing of submarine cables		
<b>Scope, deliverables and proposed time schedule of the Group :</b>		
<b>Background :</b>		
<p>Update of mechanical tests for submarine cables is needed since submarine cable installations are growing for higher powers and new applications (wind farm connections, dynamic power cables and deeper sea installations etc).</p> <p>The existing recommendation from 1997 (Electra 171) needs to be updated in the light of the experience gained during the last 15 years.</p>		
<b>Scope :</b>		
<ol style="list-style-type: none"> <li>1. Cover both impregnated paper cables and extruded cables (AC and DC) including a review of cable installation methods and cable protection for submarine cables</li> <li>2. Examination of relevant IEC standards, CIGRE recommendations and standards from the offshore industry (e.g. umbilical testing)</li> <li>3. Assess the risk for mechanical damage during installation and cable protection</li> <li>4. Assess the risk for mechanical damage after installation (anchoring, drag-net fishing, pile driving)</li> <li>5. Calculation of tensile tests to be updated and a more detailed background to be described to the selected factors (security factors and torsion as well as dynamic forces)</li> <li>6. Propose test methods to cover: <ol style="list-style-type: none"> <li>a. Dynamic cable system installations</li> <li>b. Very deep sea installations (including extruded cables)</li> <li>c. Impact tests</li> </ol> </li> <li>7. Consider the heat cycling influence on the metallic sheath and evaluate possible test methods</li> <li>8. Update/introduce mechanical tests for rigid joint</li> <li>9. Consider tests with for free-spans, strumming</li> <li>10. Consider tests for the cable interaction with e.g. J-tubes, bend restrictors etc.</li> </ol> <p>The WG should not consider umbilicals in general but follow the development of umbilical power cables.</p>		
<b>Deliverables :</b> The Working Group should prepare a Technical Brochure, a summary in Electra and a tutorial.		
<b>Time Schedule :</b> start : February 2012		<b>Final report :</b> 2015
<b>Comments from Chairmen of SCs concerned :</b>		
<b>Approval by Technical Committee Chairman :</b> Klaus Fröhlich		
<b>Date :</b> 27/02/2012		

(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>	Interactive communication with the public and with political decision maker