

**CIGRE Study Committee C6, «Distribution Systems and Dispersed Generation»**

**PROPOSAL FOR CREATION OF A NEW WORKING GROUP**

<b>WG N° C6.05</b>	<b>Name of Convenor :</b> Goran Strbac (UK)
<b>Title of the Group :</b> <i>Technical and Economic impact of DG on Transmission and Generation Systems</i>	
<p><b>Scope, deliverables and proposed time schedule of the Group</b></p> <p><b>Background:</b> Although penetration of intermittent renewable resources and other forms of distributed generation (DG) may displace significant amount of <i>energy</i> produced by large conventional plant, concerns over system costs are focussed on whether these new generation technologies will be able to replace the <i>capacity</i> and <i>flexibility</i> of conventional generating plant. Furthermore, the location of these new sources will be of considerable importance in assessing the impacts on transmission networks. Potentially, operational problems would arise from two principal causes, namely, the variability of the outputs and lack of central controllability of new generation sources (such as renewable and other forms of DG, including large and micro CHP) together with the location of this new generation in terms of the demand for new transmission capacity and the ability of DG to contribute to stability of transmission network.</p> <p>The principal concern of is the ability of systems with high penetrations of renewable and other intermittent generation to maintain desirable levels of <i>security</i> of supply, both in the short and the long term. One important aspect of system security is the ability to balance demand and generation over various time scales. Penetration of DG sources may impose additional requirements on the remaining large conventional plant and drive the need for new technologies and solutions to deliver both the capacity and flexibility necessary to maintain the continuous balance between load and generation. This may of course have additional cost implications, and the methods for quantifying such costs will be a fundamental part of the proposed WG activity. Similarly, the question of adequate transmission infrastructure and the controllability of transmission system will be of paramount importance when determining the viability of future alternative scenarios. Clearly, the location of DG may vary considerably, from being very close to the load (domestic CHP) to being remote (offshore wind farms). Furthermore, sources that are connected very deep in distribution network may have limited contribution to transmission network stability. This WG will identify the technical and economic issues associated to security of the operation transmission networks with large penetration of DG.</p> <p><b>Scope:</b> The following topics will be elaborated within the WG</p> <ol style="list-style-type: none"> <li>1. Techniques for assessing the ability of various forms of DG to displace central generation plant</li> <li>2. Cost of maintaining sufficient plant capacity in systems with large penetration of DG</li> <li>3. Impact of DG on the need for reserve and frequency regulation services</li> <li>4. Cost of balancing the system including the economic assessment of storage</li> <li>5. Steady state and stability of transmission networks with large scale penetration of DG</li> <li>6. Impact of DG on transmission infrastructure cost</li> </ol> <p><b>Deliverables:</b> Report to be published in Electra or technical brochure with summary in Electra</p> <p><b>Time Schedule:</b> start : 2003 <span style="float: right;"><b>Final report :</b> 2005</span></p>	
<b>Comments from Chairmen of SCs concerned :</b>	
<b>Approval by Technical Committee Chairman :</b>	<b>Date :</b>