

Plan for Further Work {Extract from WG Report and Consultation

14 August 2013

1.1 The Workgroup's Terms of Reference require the development of a plan to address further issues relating to RoCoF and Loss of Mains Protection. These require the Workgroup to develop proposals for consultation on any proposed changes drawing out the costs, benefits and risk of such a change to present to the January 2014 GCRP and DCRP. An outline plan is provided below.

1. *Research the characteristics (numbers/types etc) of embedded generation of less than 5MW registered capacity including likely RoCoF withstand capabilities;*
 - a. Review DNO information and survey additional sources as necessary;
2. *Investigating the characteristics of popular/likely inverter technology deployed, particularly in relation to RoCoF withstand capability and island stability;*
 - a. Survey manufacturers and installers and survey additional sources as necessary;
 - b. Assess the requirement to test equipment to verify its characteristics;
3. *Development of RoCoF withstand criteria for use in GB (as will be required by RfG 8.1(b));*
 - a. Workgroup members to develop a view of generation technologies' inherent withstand capability;
 - b. Review the final proposals (post consultation) from the July 2013 recommendations in respect of protection settings and the Total System requirement;
 - c. Identify and asses any gaps in withstand capability;
 - d. Assess the costs, benefits and risks of setting withstand capability requirements for future generators;
 - e. Assess the costs, benefits and risks of setting withstand capability requirements for existing generators;
4. *Assessing or modelling the interaction of multiple generators in a DNO power island;*
 - a. Review existing approaches to multi-machine dynamic simulation;
 - b. Develop new approaches if required;
5. *Investigating and quantifying the risks to DNO networks and Users of desensitising RoCoF based protection on embedded generators of rated capacity of less than 5MW;*
 - a. Assess the costs, benefits and risks of requirements to de-sensitise RoCOF settings for future generators of registered capacity of less than 5MW;

- 5 *Analyse the merit of retrospective application of RoCoF criteria to existing embedded generation of less than 5MW (including comparison with similar programmes in Europe);*
 - a. Review international experience of large retrospective change programmes;
 - b. Assess the costs, benefits and risks of requirements to de-sensitise RoCoF settings for existing generators of registered capacity of less than 5MW;

- 6 *Consideration of issues relating to the continuing use of Vector Shift techniques;*
 - a. Review the likely exposure of distributed generation to vector shifts in excess of recommended settings during system disturbances.