

Grid Code Short Circuit Ratio requirement for Synchronous Generators **Update paper**

National Grid presented a paper discussing issues associated with new generating technologies to the May GCRP. One of these concerned the Grid Code Short Circuit Ratio (SCR) requirement for synchronous generating units.

The SCR requirement of a generating unit influences its physical size: the higher the SCR the larger the machine. The main influence on machine size is its MVA rating: the higher it is the larger the machine. For generating units currently connected to the GB transmission system the physical size has not been an issue. A concern has been raised that as machine ratings increase in the future the physical size may result in transportation difficulties that could be a barrier to the introduction of these machines. National Grid has begun an assessment of the issue on the following basis.

Discussions with manufacturers have started, aimed at establishing whether machines built with the currently envisaged machine MVA ratings (up to approx. 2000 MVA), in combination with the current Grid Code SCR requirement, are likely to exceed size limits for transportation.

If this is the case National Grid will investigate options to address the issue. One solution may be to reduce the SCR requirement – it will be necessary to determine from manufacturers the maximum SCR that can be achieved within the size limits.

The SCR of a generating unit affects its stability performance. National Grid will need to undertake analysis of the performance of the proposed machines, and the overall transmission system with a number of such machines connected, to assess the impact of any proposed reduction in SCR, including determining whether any adverse effects can be remedied by alternative measures such as improved excitation system performance. Some analysis in this area was done and presented to the GCRP in 2001 [1]. This work did not include the large machines now proposed and so further analysis is required before any conclusions can be drawn.

It is National Grid's intention to report to the November GCRP:

- The results of its discussions with manufacturers on whether there will be issues associated with the proposed large machines and the current Grid Code SCR requirement
- Its recommendations on Grid Code modifications if they are considered necessary
- Any measures that may be necessary to ensure system stability performance if the SCR requirement is changed

[1] Grid Code Reactive Power Sub-Group – Report to the Grid Code Review Panel. Available at:- <http://www.nationalgrid.com/NR/rdonlyres/D9A1B2C1-20BB-4D1C-8F29-39DFA51081C6/3165/reactwgrep.pdf>