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Grid Code – Reactive Power Provision & Voltage Control

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H/04 Changes to Incorporate New Generation Technologies and DC Inter-connectors (Generic Provisions)

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In 2002, National Grid recognised the growing importance of new wind turbine generation and DC Interconnector technologies on the England & Wales Transmission System and the potential large increase in the volume of such technologies connecting to the system.

At the time, the existing England & Wales Grid Code provisions did not adequately cover non-synchronous wind turbine generator technologies or DC Converters. These factors made it necessary that specific provisions for such technologies were included in the Grid Code.

Changes had to be made to the following sections of the Grid Code to accommodate these changes:

- Planning Code
- Connection Conditions
- Operating Codes
- Balancing Codes
- Data Registration Code

Reactive Power Capability & Voltage Control (H/04)

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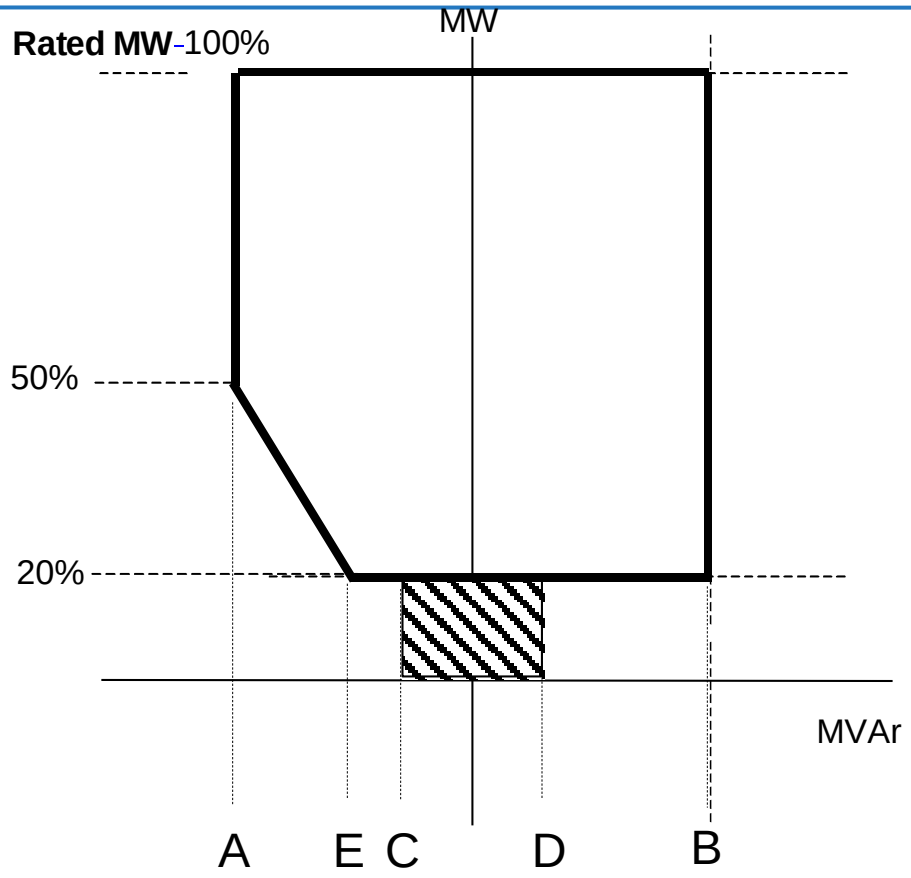
Point A is equivalent (in MVAr) to 0.95 PF lead at Rated MW output.

Point B is equivalent (in MVAr) to 0.95 PF lag at Rated MW output

Point C is equivalent (in MVAr) to -5% of Rated MW output

Point D is equivalent (in MVAr) to +5% of Rated MW output

Point E is equivalent (in MVAr) to -12% of Rated MW output



G/06 Power Park Modules and Synchronous Generating Units

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- **Voltage Control and Reactive Range Capability below 20% Active Power Output**
  - Proposal was made to introduce provisions that allowed an additional option of continuing to provide voltage control below 20% of Rated MW output. The proposal provided additional flexibility for Users and benefit to the Transmission and/or Distribution System to which it is connected.
- **Voltage Control System performance specifications for Power Park Modules and Synchronous Generating Units**
  - Proposals were made to remove ambiguity of interpretation that arises from the specification of voltage control and the performance requirements that would be expected for Power Park Modules and the Excitation performance requirements of Synchronous Generators.
- **Additional requirements identified in respect of Power Park Modules**
  - Consultation document available at:-
  - http://www2.nationalgrid.com/UK/Industry-information/Electricity-codes/Grid-code/Modifications/Concluded/2006/

GC0075 Hybrid STATCOMS

- During compliance testing of new Power Park Modules it emerged that some manufacturers had interpreted the various references in the Grid Code to continuous voltage control, as a single linear increase or decrease in reactive power.
- National Grid's interpretation of the Code was that voltage control should be continuously available and that the equipment in question had unacceptable delays before the performance could be repeated.
- Manufactures have identified a benefit in reduced costs of Hybrid designs compared to supplying a fully rated STATCOM / SVC.
- Draft workgroup report presented to the July 2015 GCRP with a full industry consultation expected later in the year.

GC0028 Constant Terminal Voltage

- A number of Generators requested clarification of the Grid Code requirements (CC.6.3.2, CC.6.3.4 and CC.6.3.8). They also questioned whether it was necessary to always operate at 1.0pu terminal voltage given that the Grid Code does not specify the target voltage at which a Synchronous Generating Unit is required to operate, and whether the terminal voltage may be adjusted when responding to a MVAr instruction.
- It was proposed to modify the Grid Code in order to clarify the requirements related to the provision of reactive power from Synchronous Generating Units.
- Consultation closed on 7th August 2015