

## Grid Code Workgroup Consultation Response Proforma

### GC0100 EU Connection Codes GB Implementation – Mod 1

Industry parties are invited to respond to this consultation expressing their views and supplying the rationale for those views, particularly in respect of any specific questions detailed below.

Please send your responses by **5pm on 2 October 2017** to [grid.code@nationalgrid.com](mailto:grid.code@nationalgrid.com).

Please note that any responses received after the deadline or sent to a different email address may not receive due consideration by the Workgroup.

Any queries on the content of the consultation should be addressed to Chrissie Brown at [Christine.brown1@nationalgrid.com](mailto:Christine.brown1@nationalgrid.com)

<b>Respondent:</b>	<i>PThomas@nordex-online.com</i>
	<b>Nordex Acciona Wind Power</b>
<b>Please express your views regarding the Workgroup Consultation, including rationale.</b> <b>(Please include any issues, suggestions or queries)</b>	<p><i>For reference, the Grid Code objectives are:</i></p> <ul style="list-style-type: none"><li>i. To permit the development, maintenance and operation of an efficient, coordinated and economical system for the transmission of electricity</li><li>ii. To facilitate competition in the generation and supply of electricity (and without limiting the foregoing, to facilitate the national electricity transmission system being made available to persons authorised to supply or generate electricity on terms which neither prevent nor restrict competition in the supply or generation of electricity)</li><li>iii. Subject to sub-paragraphs (i) and (ii), to promote the security and efficiency of the electricity generation, transmission and distribution systems in the national electricity transmission system operator area taken as a whole</li><li>iv. To efficiently discharge the obligations imposed upon the licensee by this license and to comply with the Electricity Regulation and any relevant legally binding decisions of the European Commission and/or the Agency; and</li><li>v. To promote efficiency in the implementation and administration of the Grid Code arrangements</li></ul>

### Standard Workgroup Consultation questions

Q	Question	Response
1	Do you believe that GC0100 Original proposal, or any potential alternatives for change that you wish to suggest, better facilitates the Grid Code Objectives?	See below
2	Do you support the proposed implementation approach?	Yes
3	Do you have any other comments?	No
4	Do you wish to raise a WG Consultation Alternative Request for the Workgroup to consider?	No

### Specific GC0100 questions

Q	Question	Response
1	Removing More Stringent Requirements' concerns have been expressed by some Workgroup members that applying more stringent requirement on newly connecting parties (that fall within this scope of the EU Network Codes for generation, demand and HVDC systems) maybe incompatible with EU law. Do you have any views on this topic that could assist the Workgroup when they are considering the topic in due course?	No
2	Are you comfortable with using the EU definition of Maximum Capacity instead of the GB definition of "Registered Capacity"?	Yes
	<b>Fast Fault Current Injection questions</b>	
3	What are your views on options 1, 2 and 3 as set out in paragraph 4.4 for Fast Fault Current Injection and which	Option 1 hasn't been considered by Nordex . Options 2&3

	option (if any) would you prefer?	Either Option is technically feasible: see (4)
4	Do you have any alternative fast fault current injection solutions noting that the requirement applies to the Converter not the wider Power System?	<p>ECC.6.3.16.3.1</p> <ul style="list-style-type: none"> <li>- Zero voltage does not really occur, can it be further specified what is meant by falling to zero (see also FRT)</li> <li>- Reactive current is required to reach at least 1.25 p.u. of the rating of the power park module. We propose to add a definition for this rating as rated active power. In other words to use active current at rated active power and <math>\cos(\phi) = 1</math> as a basis. Considering the current ratings of expected modules used, this addition to the modification is very important to us.</li> <li>- The forbidden zone lies at either 1.0 p.u. or 1.25 p.u reactive current, where 1.25 p.u. is high. It would make sense and help to require the mean current after 120 ms to stay above this forbidden zone but allow the instantaneous current, due to oscillating behaviour, to temporarily be below 1.0 or 1.25 p.u. Or alternatively, to define a deadband below 1.25 p.u.</li> </ul>
5	In considering the three Fast Fault Current Injection options 1, 2 and 3 in paragraph 4.4 do you have any comments in relation to technology readiness, cost implications, and can they be implemented date within the context of product development timescales?	See (4)
6	Do you have any evidence to support your views?	Confidential
7	Do you have any views on the specific costs related to the additional requirements?	No
8	Is the current proposed wording for the remote end HVDC and DC Connected Power park modules sufficient to facilitate future new technology?	N/A
	<b>Banding questions</b>	
9	What are the specific costs related to the additional requirements?	None
10	Do you have any views on the banding thresholds for the original and those suggest for the	No

	possible alternative?	
11	Can you provide any feedback/comments on the associated legal text?	See (4)
	<b>Fault Ride Through</b>	
12	<p>Do you support the fault ride through voltage against time curves</p> <p>If not please state why you disagree, what alternative you would recommend and your justification for any alternative?</p>	<p>General Comment:-</p> <p>For multiple and sequential FRT performance it is very important that PPU's do not face unrealistic requirements. Whilst FRT tests at zero volt are done and passed in a test environment, Nordex have many hundreds of real FRT measurements. These are both single and multiple three phase faults on transmission connected wind farms taken over several years. The retained voltage has been well above zero volt at the PPU.</p> <p>For multiple / repetitive faults, actual FRT performance strongly depends on realistic values being specified for retained voltage.</p> <p>Nordex therefore believe the GCode requirements should distinguish between symmetrical and asymmetrical faults, and assume realistic retained voltage levels at the PPU.</p>
13	Do you have any specific views about the proposal to modify the stage 2 under voltage protection for distributed generation interface protection?	No
	<b>Other questions</b>	
14	Does the Legal drafting contained in annex 2 and 3 deliver the intent of the solution outlined in section 3?	N/A
15	Do you have any information based on the proposed solution in respect of implementation costs?	No