

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.

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

Respondent:	Marko Grizelj, marko.grizelj@siemens.com , 01614466930
Company Name:	Siemens
Please express your views regarding the Workgroup Consultation, including rationale. (Please include any issues, suggestions or queries)	<p>In general, the work group consultation was a success with a number of key topics being addressed. Unfortunately, due to the lack of manufacturer presence, particularly for HVDC, a number of topics were not addressed in sufficient detail.</p> <p>Siemens's views on particular matters within this consultation will be reflected in the answers to the questions below.</p> <p><i>For reference, the Grid Code objectives are:</i></p> <ul style="list-style-type: none"> i. To permit the development, maintenance and operation of an efficient, coordinated and economical system for the transmission of electricity 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) 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 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 v. To promote efficiency in the implementation and administration of the Grid Code arrangements

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?	
2	Do you support the proposed implementation approach?	
3	Do you have any other comments?	
4	Do you wish to raise a WG Consultation Alternative Request for the Workgroup to consider?	<i>If yes, please complete a WG Consultation Alternative Request form, available on National Grid's website, http://www2.nationalgrid.com/uk/industry-information/electricity-codes/grid-code/modifications/forms-and-guidance/ and return to the Grid Code inbox at grid.code@nationalgrid.com</i>

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?	
2	Are you comfortable with using the EU definition of Maximum Capacity instead of the GB definition of "Registered	

	Capacity”?	
	Fast Fault Current Injection questions	
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 (if any) would you prefer?	<p>Option 1 bears a heavy impact on the current designs of the converter system, both in terms of hardware and software. Successful implementation of Option 1 would require a coordinated and focused effort from the industry and the TSO to ensure that an economical and effective solution is developed.</p> <p>Option 2 simply bears an impact on the hardware costs. Supplying current over 1.0pu rated current may in some specific cases be possible to a certain degree (taking into consideration various project parameters). However, specifying a blanket 1.25 pu rated current supply will ensure that costs definitely increase and would further limit competitiveness of HVDC technology.</p> <p>Option 3 is the preferred solution given the current status of the technology and market. As mentioned previously, Siemens’s understands that Option 3 on its own will not solve the predicted future issues with the network. Alternative options should be investigated in a dedicated and focused working group with the appropriate representation from the industry.</p>
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>Siemens considers that current options discussed above are applicable to systems connected to the UK main network. The Options should not be forced on to Remote End Converters and DC Connected Power Park Modules, as the particulars of an offshore network and the related control systems are very different to those onshore*.</p> <p>Therefore flexibility should be included to allow an optimal solution for FFCI offshore. This can include wording to ensure that the remote end converter <u>and/or</u> DC Connected Power Park modules can coordinate their contribution according to the implementation of the protection system and the limits of the technology.</p> <p>*AC Protection system for offshore applications can be design according to the implemented short circuit contributions from the respective systems.</p>
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?	
6	Do you have any evidence to support your views?	
7	Do you have any views on the specific costs related to the additional requirements?	With respect to the Remote End Converters, the FFCI requirements would not only drive costs up for Option 1 and 2 and thus make HVDC offshore transmission significantly less competitive than its AC counterpart but it would also eliminate possible technological alternatives. This includes Siemens's offshore diode rectifier solution (SGA-DRU). The SGA-DRU was developed as a result of a focused effort to further reduce the cost of offshore transmission systems whilst still ensuring a reliable connection onshore. The passive nature of SGA-DRU would mean that the current requirements on FFCI would not be met. SGA-DRU would rely on the current contribution from the Power park modules.
8	Is the current proposed wording for the remote end HVDC and DC Connected Power park modules sufficient to facilitate future new technology?	<p>Siemens's view is that in the case of an offshore connection, the offshore system is decoupled from the onshore grid in using a HVDC connection. Therefore requirements as set out for onshore connected HVDC converters should not automatically apply to offshore as this severely limits innovation in the technology and imposes unnecessary costs that are eventually transferred to the end user.</p> <p>Siemens would ensure that alternative solutions, which still comply with onshore system stability requirements and retain expected reliability figures, should not be discounted due to excessively onerous offshore requirements, particularly when those same requirements can be met by the corresponding power park modules connected to the system.</p>
	Banding questions	
9	What are the specific costs related to the additional requirements?	
10	Do you have any views on the banding thresholds for the original and those suggest for the possible alternative?	

11	Can you provide any feedback/comments on the associated legal text?	
	Fault Ride Through	
12	Do you support the fault ride through voltage against time curves If not please state why you disagree, what alternative you would recommend and your justification for any alternative?	
13	Do you have any specific views about the proposal to modify the stage 2 under voltage protection for distributed generation interface protection?	
	Other questions	
14	Does the Legal drafting contained in annex 2 and 3 deliver the intent of the solution outlined in section 3?	It is not immediately clear that alternative requirements can be agreed for Remote End Converters and DC Connected Power park modules (within the framework of the EU grid code).
15	Do you have any information based on the proposed solution in respect of implementation costs?	