

Distribution Code Consultation Response Proforma

DCRP/19/05/PC: DCode EREC G99 Fast Fault Current Injection Modifications

Modifications to The Distribution Code and EREC G99 of the requirements for Fast Fault Current Injection

Stakeholders are invited to respond to this consultation, expressing their views or providing any further evidence on any of the matters contained within the consultation document. Stakeholders are invited to supply the rationale for their responses to the set questions.

Please send your responses and comments by **17:00 on 03 May 2019** to dcode@energynetworks.org and please title your email 'Consultation Response DCRP/19/05/PC DCode EU Exit Modifications'. Please note that any responses received after the deadline may not receive due consideration by the Working Group.

Any queries on the content of the consultation pro-forma should be addressed to DCode Administrator on 020 7706 5105, or to dcode@energynetworks.org

Respondent	<i>Alan Creighton</i>
Company Name	<i>Northern Powergrid</i>
No. of DCode Stakeholders Represented	
Stakeholders represented	
Role of Respondent	<i>Distributor</i>
We intend to publish the consultation responses on the DCode website. Do you agree to this response being published on the DCode website? [Y/N]	Y

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	Question	Response
1.	Do you believe that the proposed modifications, as set out in the DCRP/19/x/PC Consultation Pack, would better facilitate the Applicable Distribution Code Objectives in relation to the implementation of FFCI?	Yes
Q2	Do you agree with the proposed legal text changes in Appendix 1 of this consultation? If not, please identify any alternative text suggestions with your reasoning.	Yes, subject to consideration of the editorial points identified in the attached annotated copy of the proposed G99 changes [reproduced below – transcribed from the original response from Mr Creighton.]
Q3	Do you have any other relevant comments?	No

	Issue	DNOs response
4	<p>12.6.2(a) - I can see that the requirement relates to transmission system faults, but the generator doesn't know which system the fault is on, so it would be better to refer to faults more generically - which would co-ordinate with the use of the word 'fault' later in the text.</p> <p>Change to:</p> <p>For any unalanced fault which results in the voltage at the.....</p>	Whilst there is nothing wrong with the logic of this suggestion we do not propose to adopt it since the obligation is on Generators to ride through faults on the transmission system, as opposed to the distribution system. The voltage conditions specified are those for transmission faults only. As the working group considered this wording carefully, it would not be appropriate to change it.
5	12.6.2(b) – suggest removing the explicit reference to the transmission system	As Issue 4 above
6	<p>12.6.2.(b)</p> <p>Each Power Park Module shall be required to inject a reactive current IR which shall not be less than its pre-fault reactive current and which shall as a minimum increase with the fall in retained voltage</p>	We can adopt this minor improvement. It does introduce a minor difference with the Grid Code drafting, but it is not material.

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7	Fig 12.5 – inconsistent capitalization of reactive current	Accepted – will modify in the final version
8	Fig 12.5 – part of one of the label values is inconsistently in bold	Accepted – will modify in the final version
9	Fig 12.5 and 12.6 – inconsistent labelling of the abscissa	Accepted – will modify in the final version
10	<p>12.6.2.(c) “The injected current shall be above the shaded area shown in Figure 12.5 6 (a) or Figure 12.5 6 (b). with priority being given to reactive current injection with any residual capability being supplied as active current.” Shouldn’t the “or” be “and”? We require the behaviour as per 12.6a for a voltage depression <140ms and 12/6 b for a voltage depression >140ms.</p> <p>Agree that in a given event only one of the two requirements will apply.</p>	This paragraph is talking about a particular fault - so arguably OR is more correct. No change proposed.
11	<p>12.6.2.(c) “Under any fault condition, where the voltage falls below 0.9 pu, there would be no requirement for each Power Park Module or constituent Generating Unit to exceed its transient or steady state rating.”</p> <p>As above - here the reference is to any fault rather than any fault on the Transmission System</p>	The phrase is true for any fault. No change proposed.
12	<p>12.6.2.(c) there would be no requirement for each <u>any</u> Power Park Module or constituent Generating Unit to exceed its transient or steady state rating.</p>	OK. This change can be made. It is introducing a minor divergence from the Grid Code words, but it is not material.
13	Fig 12.5(a) and (b) – the two diagrams are inconsistent in how they refer to the red shaded area.	Agree – we will make them consistent.

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14	Fig 12.5(a) and (b) – (a) is for <140ms and (b) is for >140ms – this does not therefore include 140ms exactly	OK – will correct.
15	12.6.2(d) – superfluous “+” in the expression.	Agree - will correct.
16	12.5.6.(f) Clarity - Only permitted to block what?	Current. This G Code wording agreed by the working group and understood by manufacturers. It is therefore not appropriate to change at this time.
17	12.5.6.(f) “Figures 12.6 (a) or and Figure 12.6 (b) show the impact of variations in fault clearance time”	Agree - will correct.
18	12.5.6.(f) “140_ms”	Agree - will correct.
19	12.5.6(f) – inconsistent spelling of connexion	Agree – will make consistent
20	12.5.6.(g) “To permit additional flexibility for example from Power Park Modules made up of full converter machines Generating Units, DFIG machines Generating Units or induction machine generators Generating Units, the”	Agree – this is more precise and consistent. It is a minor divergence from the Grid Code text but not material.
21	The above comments generally apply to Section 13 of the document too.	Agree – will address as above.

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Please send your responses and comments by **17:00 on 03 May 2019** to dcode@energynetworks.org and please title your email 'Consultation Response DCRP/19/05/PC DCode EU Exit Modifications'. Please note that any responses received after the deadline may not receive due consideration by the Working Group.

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Respondent	Dr Isaac Gutierrez
Company Name	ScottishPower renewables
No. of DCode Stakeholders Represented	1
Stakeholders represented	<i>ScottishPower Renewables Ltd</i>
Role of Respondent	<i>Generator</i>
We intend to publish the consultation responses on the DCode website. Do you agree to this response being published on the DCode website? [Y/N]	Y

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Please send your responses and comments by **17:00 on 10 May 2019** to dcode@energynetworks.org and please title your email 'Consultation Response DCRP/19/05/PC DCode EU Exit Modifications'. Please note that any responses received after the deadline may not receive due consideration by the Working Group.

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Respondent	<i>Thorsten Bülo</i>
Company Name	SMA Solar Technology AG
No. of DCode Stakeholders Represented	1
Stakeholders represented	<i>SMA Solar Technology AG</i>
Role of Respondent	<i>System Development Engineer</i>
We intend to publish the consultation responses on the DCode website. Do you agree to this response being published on the DCode website? [Y/N]	Y

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Q3	Do you have any other relevant comments?	Yes, please see below

Page No	Line No	Clause/ Subclause	Paragraph Figure/ Table	Type of comment (General/ Technical/Editorial)	COMMENTS	Proposed change	OBSERVATIONS OF THE SECRETARIAT on each comment submitted
116 /120		12.6.2	(a), (h)	Technical	<p>It should be clarified, that a dynamic reactive current may also be injected in the case of an unbalanced fault.</p> <p>It can even consist of positive and negative sequence additional reactive current.</p> <p>In paragraph (h)</p>	<p>Add a footnote, e.g. in addition to (h):</p> <p>This reactive current in case of unbalanced faults may incorporate a negative sequence reactive current.</p>	<p>The WG debated the challenge of balanced and unbalanced faults at length and decided that the current drafting was appropriate. As such the drafting was updated at the end of the process so that symmetrical faults are treated in a different way to asymmetrical faults. The revised text permits greater flexibility with regard to unbalanced faults. The G99 text here matches that in the Grid Code ECC 6.3.16. The WG agreed that the drafting of both the ECC and G99 should be as close to identical as possible.</p>

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116		12.6.2		Editorial		Shall not be less than its pre-fault...	Well spotted. Thank you.

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116		12.6.2	(b)	Technical	<p>It is unclear, if the graph is to be met in any case (unless otherwise agreed) or if the minimum requirement is lower:</p> <p>The phrase “shall as a minimum increase with the fall in retained voltage “ may be interpreted as proportional behaviour of delta i/delta V. According to Figure 12.5 and paragraph (a) it is way more than directly proportional (depending on the pre-fault operation point delta i/delta v >3, which is a very high value expected at the connection point).</p> <p>The graph should reflect the proportion consistently to the text. Or it should be more clear, if there is a preferred and a minimum requirement.</p> <p>It seems, what is meant, is, that in any case the additional reactive current has to meet the minimum requirement of direct proportion to the fall in voltage, but what is wanted is the current larger than the heavy black line.</p> <p>Additionally, the phrase “during a fault on the transmission system” should be replaced by a</p>	<p>Change b) to:</p> <p>Figure 12.5 defines the reactive current IR that is preferably to be supplied during a fault on the Transmission System voltage depression and which is dependent on the pre-fault operating conditions, and the voltage retained at the Connection Point.</p> <p>As a minimum requirement, each Power Park Module shall be required to inject a reactive current IR which shall not be less than its pre-fault reactive current and which shall increase directly proportional with the fall in retained voltage the latest, each time the retained voltage at the Connection Point falls below 0.9 pu, whilst ensuring that the overall rating of the Power Park Module is not exceeded.</p>	<p>The requirement is mandatory, so it is not appropriate to introduce “preferably”.</p> <p>Again the words here were carefully chosen by the WG after extensive debate. The line up with the Grid Code so to change them now would probably introduce greater confusion.</p> <p>There is no requirement to ride through distribution faults in general. The RfG requirement relates only to transmission faults, although of course you are correct in that they only manifest themselves as a change in voltage for embedded generation.</p>
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					“voltage depression”, since this is what the generation unit can detect.		

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