

# Distribution Code Consultation Response Proforma

## DCRP/21/01/PC: G98 / G99 Minor Technical Modification

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, 19<sup>th</sup> March 2021** to [dcode@energynetworks.org](mailto:dcode@energynetworks.org) and please title your email 'Consultation Response DCRP/20/06/PC DCode Storage Modification. 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](mailto:dcode@energynetworks.org)

<b>Respondent</b>	Keith Chambers ( <a href="mailto:chambers_keith@cat.com">chambers_keith@cat.com</a> )
<b>Company Name</b>	Caterpillar Electric Power Division
<b>No. of DCode Stakeholders Represented</b>	-
<b>Stakeholders represented</b>	Manufacturers, Generators
<b>Role of Respondent</b>	Grid Code Integration Manager
<b>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]</b>	Yes

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	Question	Response	Observations of the Secretariat
Q1	Do you agree with the general intent of the proposed modification? If not, please explain your views.	Yes	
Q2	If you have any detailed comments on the proposed drafting, please provide those comments in the proforma provided, or by marking up the consultation drafts of G98 and/or G99.	Proforma used	
Q3	Do you have any comments in respect of the inclusion of the references to cyber security?	The ENA Distributed Energy Resources – Cyber Security Connection Guidance applies to DERs in general. From a manufacturers’ perspective it is difficult to separate the power generating facility (PGF) requirements from the power generating unit (PGU) requirements. More clarification on PGU level requirements would be helpful for manufacturers to understand their scope of supply compared with the facility level requirements.	Thank you for your comments. We have currently decided to amend these requirements as per the attachment below.
Q4	Do you agree that the proposed modifications satisfy the applicable Distribution Code objectives? If not, please explain your concerns.	Yes	

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Please provide comments relating to the specific technical content of the proposed modifications<sup>1</sup>

Page / line No	Clause/ Subclause	Paragraph Figure/ Table	Type of comment (General/ Technical/Editorial)	COMMENTS	Proposed change	OBSERVATIONS OF THE SECRETARIAT on each comment submitted
47 / 17	G99 6.1.4.2		Editorial	Change reference from 13.8 to 13.9	"Similarly if the Registered Capacity of a Power Generating Facility in England and Wales is 50 MW or more, the Generator will have to comply with paragraphs 6.4.4 and 13.9."	Noted thank you – we will correct this.  The mistake was with numbering in para 13.8 so that has been amended rather than the references
95 / 3	G99 10.3.6, 10.3.7		General	The protection standards mentioned under section 10.3.6 must be fulfilled by the interface protection system, either if it is installed separately or when it is a part of the PGM control equipment. For clarity it is proposed to refer to the interface protection in section 10.3.6 as stated in Annexures A.7.1 and A.7.2.	"10.3.6 Interface Protection equipment is required to function correctly within the environment in which it is placed and shall satisfy the following standards:"	Whilst we accept the logic of your point considering just the scope of G99, the statement is nevertheless correct for all protection when considering the owner's other Distribution Code obligations. We will leave the drafting as it is for now.
156 / 23	G99 13.9.1		Editorial	Change reference from 13.8 to 13.9	"13.9.1 Where a Generator in respect of an Embedded Medium Power Station is a party to the CUSC this Section 13.9 will not apply."	Noted thank you – we will correct this.

<sup>1</sup> Add more rows if required

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167 / 33	G99 15.6.1		Technical	<p>The family approach to type testing (footnote 14) references the approach taken in Germany by VDE, however the implementation of family grouping proposed in G99 is not exactly the same as VDE. The approach taken by VDE is to apply the (1/v10) and (v10) multiplication factors to the nominal apparent power of the type-tested generating unit, whereas the G99 approach is to apply the same multiplication factors to the Generating Unit Registered Capacity which is the nominal Active Power capacity of a PGM taking into account the Active Power consumed when producing the same.</p> <p>The amount of power consumed by PGM-auxiliaries depend on multiple factors including:</p> <ol style="list-style-type: none"> <li>1. Project-scope (stationary power, CHP application, etc.)</li> <li>2. Current level of power production (DNOs may request operation below nominal power)</li> <li>3. Type of fuel available (gas processing, etc.)</li> </ol> <p>Owing to the above points, the G99 'Registered Capacity' definition accounting for the power consumed by auxiliaries, will complicate the application of the v10-factors for product-family grouping.</p> <p>It is therefore proposed to use the Nominal Active Power of the of type-test PGMs when applying the v10 factors. The power</p>	<p>"The approach is permissible in the following range of Generating Unit electrical output:</p> <ul style="list-style-type: none"> <li>• For Synchronous Generating Units: <ul style="list-style-type: none"> <li>○ Lower limit: <math>1/\sqrt{10}</math> (0.3162) times the tested Generating Unit <del>Registered Capacity</del> Nominal Active Power</li> <li>○ Upper limit: <math>\sqrt{10}</math> (3.162) times the tested Generating Unit <del>Registered Capacity</del> Nominal Active Power</li> </ul> </li> <li>• For all other Generating Units: <ul style="list-style-type: none"> <li>○ Lower limit: <math>1/\sqrt{10}</math> (0.3162) of tested Generating Unit <del>Registered Capacity</del> Nominal Active Power</li> <li>○ Upper limit: 2 times tested Generating Unit <del>Registered Capacity</del> Nominal Active Power"</li> </ul> </li> </ul>	<p>Thank you - this is a valid point.</p> <p>It seems in appropriate to actually define a new term – but we can remove the Registered Capacity term here and replace it with nameplate rating (in W).</p>
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				consumed by the PGMs can then be handled on a power generating facility level.		
234 / 5	G99 Form A2-2		Technical	In Form A2-2 "1. Operating range" tests for Type A PGMs refer only to LV networks (230 V). Operating at 85 % of the nominal voltage for 90 minutes (Test 2) is not a requirement for higher-kilowatt PGMs connected to HV networks. As the voltage operating range solely depends on the alternator for SPGMs, it is proposed to accept the datasheets provided by the alternator manufacturer.	<p>"Tests should be carried with the Power Generating Module operating at Registered Capacity and connected to a suitable load bank, test supply, or grid simulation set. As an alternative, datasheets and Manufacturer Information can be used to declare the operating range for PGMs connected to HV networks"</p> <p>Can it be confirmed that alternator datasheets suffice to achieve "Type Test" status?</p>	If the manufacturer can confirm that the alternator will pass such tests, ideally because these have been done as factory and/or type tests, then yes.
235 / 17	G99 Form A2-2		Technical	In Form A2-2 "4. Power Factor" tests for Type A PGMs refer only to LV networks (230 V). Annex A.7.2.5.2 specifies three test voltages, viz., 230 V –6%, 230 V and 230 V +10%. As the power factor range solely depends on the alternator for SPGMs, it is proposed to accept the datasheets provided by the alternator manufacturer.	<p>Question:</p> <p>Manufacturer Information, i.e., alternator datasheet is already a viable option. Can it be confirmed that alternator datasheets suffice to achieve "Type Test" status?</p>	Provided the manufacturer has tested etc with appropriate rigour. This is already catered for in the definition of Manufacturer's Information

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235 / 17	G99 Form A2-2		Technical	Form A2-2 "4. Power Factor" tests, Annex A sections A.7.1.4 and A.7.2.5.2 specify three test voltages, viz., 230 V –6%, 230 V and 230 V +10%. But, the time period for these tests is not explicitly mentioned. For LV network connected PGMs, it is proposed to test for 5 minutes at each of these voltage levels.	<p>Proposal for Form A2-2, Annex A sections A.7.1.4 and A.7.2.5.2.</p> <p>"Each of the below mentioned cases shall be tested for a minimum of 5 minutes:</p> <ol style="list-style-type: none"> <li>230 V, -0.95 power factor (under-excited operation)</li> <li>230 V, +0.95 power factor (under-excited operation)</li> <li>230 V –6%, -0.95 power factor</li> <li>230 V –6%, +0.95 power factor</li> <li>230 V +10%, -0.95 power factor</li> <li>230 V +10%, +0.95 power factor</li> </ol> <p>The effect of network side OLTCs (On-load tap changers) will be considered when evaluating field measurements."</p>	This is a test of PF control, not of reactive power capability. We do not see a need to specify a time for this. Once the machine has settled to its new active/reactive output, that should be sufficient time.
236 / 6	G99 Form A2-2		Technical	In Form A2-2 "10. Protection – Re-connection timer" tests for Type A PGMs refer only to LV networks (230 V). It is proposed to add the testing range for HV networks.	<p>"10. Protection – Re-connection timer ... Checks on no reconnection when voltage or frequency is brought to just outside stage 1 limits of Table 10.1.</p> <p>At 1.16 p.u. (180 V for LV connection)  At 1.12 p.u. (for HV connection)  At 0.78 pu (180.0 V for LV connection)</p>	Yes – this is a good point – we will address this.

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9.1.7 Every **Power Generating Module** and any associated equipment must be designed and operated appropriately to comply with cyber security requirements. The **Generator** shall consider all cyber security risks applicable to the **Power Generating Module** in terms of the communication between any energy management system etc and also in terms of interaction with any system of the **Manufacturer** for product management.

9.1.8 The **Generator** shall provide information describing the high level cyber security approach, as well as the specific cyber security requirements complied with. The statement will make appropriate reference to the **Power Generating Facilities** compliance with:

- ETSI EN 303 645;
- relevant aspects of PAS 1879 “Energy smart appliances – Demand side response operation – Code of practice”;
- relevant aspects of “Distributed Energy Resources – Cyber Security Connection Guidance” published by BEIS and the ENA;
- Any other relevant standard that has been incorporated in the design of the **Power Generating Module**.

Forms A2-1, A2-2 etc:

<u>14. Cyber security</u>	
<u>Confirm that the <b>Power Generating Module</b> has been designed to comply with cyber security requirements, as detailed in 9.1.7.</u>	<u>Yes / NA</u>

Caterpillar: Confidential Green

19 February 2020

DCRP/21/01/PC