Workgroup Consultation Response Proforma

GC0141: Compliance Processes and Modelling amendments following 9th August Power Disruption

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 to grid.code@nationalgrideso.com by 5pm on **30 March 2021**. Please note that any responses received after the deadline or sent to a different email address may not receive due consideration by the Workgroup.

If you have any queries on the content of this consultation, please contact Joseph Henry Joseph.henry@nationalgrideso.com or grid.code@nationalgrideso.com

Respondent details	Please enter your details
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For reference the Applicable Grid Code Objectives are:

a) *To permit the development, maintenance and operation of an efficient, coordinated and economical system for the transmission of electricity*
b) *Facilitating effective 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);*
c) *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;*
d) *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*
e) *To promote efficiency in the implementation and administration of the Grid Code arrangements*

Please express your views regarding the Workgroup Consultation in the right-hand side of the table below, including your rationale.

Standard Workgroup Consultation questions		
1	Do you believe that the GC0141	SGRE agrees in general with the changes to the compliance process and modelling amendments.

	Original Proposal better facilitates the Applicable Objectives?	
2	Do you support the proposed implementation approach?	Yes
3	Do you have any other comments?	SGRE has some additional comments: PC.A.9.5: Related to Replica control systems the ~~clear~~ very specific terms of RTDS and RScad as specific technologies should be removed. As this is a very new "requirement" within the grid code (even referring to a bilateral agreement) it should be defined technology neutral – e.g. "Replica control systems, Real Time Simulator" to allow different technologies to be used. Furthermore, we see this as a new, additional approach for grid compliance of PPM' and believe much more specification work is required to make this applicable to get the needed results. References to international standards: The proposal refers in some section to IEC standard. It should be considered that the standard reference only contains the standard number or series (e.g. IEC 61400-21-1), but to remove the year. Rather utilize the latest applicable standard. E.g. IEC 61400-21 (2001) is probably outdated.
4	Do you wish to raise a Workgroup Consultation Alternative Request for the Workgroup to consider?	
Modification Specific Workgroup Consultation questions		
5	What should the Independent Engineer's deliverables be with respect to the outcome of the compliance process?	With regards to the "Independent Engineer / Independent Test Body" it needs to be specified how this role is defined: - Can it be a consultant, a certification body, a measurement institute? - What is the scope and what are the tasks of such a role? What authority does the "Independent Engineer" has? - How is the "Independent Engineer" chosen - by the Generator owner or NGESO?

		- Are there specific requirements to become an "Independent Engineer" and what are the assessment criteria?
6	Should there be specific requirements on the retention of data for the User and/or the ESO?	Click or tap here to enter text.
7	Should the detailed design stage be more clearly identified within the Grid Code?	Click or tap here to enter text.
8	What stages of implementation would the industry believe are appropriate?	Click or tap here to enter text.
9	Should the ESO be required to undertake the responsibilities associated with an independent engineer? Please outline your rationale.	For SGRE as an OEM the direct interaction with the ESO regarding the compliance process is limited to the Power Park Unit data (e.g. manufacturer data, measurements, simulation models and data, validation reports). For this area SGRE recommends keeping the responsibilities with ESO. A direct technical link is very important, especially if complexity increases. Furthermore, responsibilities associated with an "Independent Engineer" should be with the ESO. It is probably important to have one organization which takes the responsibility related to the role, process, and responsibilities related to "Independent Engineers".
10	Should there be greater definition be given to "substantial modification" given that the self-certification process places the onerous on the User to	Click or tap here to enter text.

	make these decisions?	
11	Should there be a review of the effectiveness of GC0141 post implementation and after the industry has experience of implementing?	Changes related to GC0141 to the compliance process and modelling amendments are substantial. It is seen as very important to evaluate the new processes and their effectiveness after implementation and adopt if needed. This is also a chance to improve grid compliance from a technical side as well as the process side.
12	What are your thoughts on the workgroup's discussions regarding compliance repeat plan? How would this work in regard to Independent Engineer Verification?	In general, it is essential that a PPM is not only grid compliance during the study phase / commissioning of a PPM (which results in a FON), but also along the lifetime of the PPM (as long as it is connected to the power system). It is unclear whether or not the specified compliance repeat plan will support to achieve this! It is probably required to understand which elements are of interest for repeated grid compliance.
13	Do you believe that screening processes should be applied ahead of detailed dynamic EMT simulation, and if so, do you believe data exchange should support that?	Click or tap here to enter text.
14	Do you agree that the roles and responsibilities associated with interaction studies should be detailed and clarified, and to what extent?	SGRE believes that it essential to clarify roles and responsibilities related to interaction studies.

15	Do you agree that improved definitions of the types of analysis and definitions suitable analysis environments ahead of the detailed design phase provides useful clarity and minimised project disruption in delivering the principles of this grid code change? Should these form part of legal text or made available with the modification as guidance that may be separately updated from time to time	Click or tap here to enter text.
16	Do you agree that clarifying roles and responsibility in the management of interaction studies assists more clearly defining the analysis needs of each party, minimising confusion, unnecessary overlap and cost in the design phase?	Click or tap here to enter text.
17	Do you agree that small signal	

	analysis supporting the screening of interaction cases should be clearly specified within this grid code change, to better focus the range of EMT studies being discussed, and within the context of existing SSTI and SSO analysis better inform assessment of risks and the need for detailed dynamic simulation which includes shaft data for SSTI?	
18	What is your view on the separation of the simplified RMS model and EMT model when it comes to confidentiality, distribution and the protection of IP?	A separation of the simplified RMS model and EMT model regarding confidentiality, distribution and IP protection is essential. As the GC0141 proposal suggests for RMS model focus on standard models like IEC or WECC. These are generic models with open model structure, where the OEM provides relevant parameter to parameterize the simulation model. In addition, there may be a need for more detailed RMS models (e.g. certain aspects of the specific Power Park Unit are not modelled within the standard models), which would usually be delivered as DLL models. In contrast to RMS models EMT models are usually encrypted, user specific models which contain very detailed information (e.g. converter control). Therefore confidentiality, IP protection and distribution are very important. As EMT models are often ~~utilize~~ based on actual source and utilize dll's for certain components (e.g. converter control, dependent on the technology) and the

		fact that such equipment may be externally sourced, encryption is essential to live up to IP protection requirements. Furthermore, aspects of cyber security should be considered for EMT models and their handling.
19	As it currently stands, what is your view on the process by which detailed manufacturer EMT-type models are exchanged for necessary studies as part of project delivery?	With increasing complexity of PPM's (e.g. offshore PPM, HVDC connected PPM) and further increase in RE deployment, the use of EMT models for necessary studies is seen as mandatory. This means that EMT-type model exchange will be more and more important in the future.
20	Are sections PCA.9.8 and PC.A.9.9 better suited to a guidance document and or should they be included, at least partly, within the legal text? Are there any specific concerns with respect to requirements set out within those sections?	SGRE welcomes the question about PC.A.9.8 and PC.A.9.9. In general, we think it is better suited at this point in time to have the two sections (for the models) within a guidance document. This applies especially for the details outlined for the EMT models in section PC.A.9.9. Furthermore, the concept of a guidance document was very useful in the past (e.g. Guidance Note for Power Park Developer) **In relation to the RMS models (PC.A.9.3.5 and PC.9.8), SGRE's view is:** PC.A.9.3.5 **The Company** may, when necessary, require the **User** to provide details of the proper operation of its complete RMS system representation or to facilitate its understanding of the results of a RMS dynamic simulation. **The Company** may, when necessary, request additional information concerning the RMS control system model, which may include control system model documentation or source code of one or more routines in the RMS control system model. PC.A.9.3.5 The performance requirements for the RMS control system model are included in Appendix PC.A.9.8 Apply the first paragraph of the proposal for the grid code. In line with the question we would suggest removing the second paragraph (also marked PC.A.9.3.5) and consequently move the content of PC.A.9.8 into a specific guidance document. Is the first paragraph (also marked PC.A.9.3.5) required in case standard models are used? Such a guidance document shall be developed within a separate working group due to its complexity. In case there

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		is a requirement to submit ~~a~~ vendor specific model instead of ~~the~~ standard models (e.g. IEC, WECC) it would be a huge task to provide models which comply with PC.A.9.8 as ~~of today~~currently specified.~~.~~ It should be considered how dll based models can be accepted / used as more detailed RMS models maybe required. For example, automatic code generated models should be supported if detailed block diagrams and appropriate model documentation is delivered by the vendor. **In relation to the EMT models (PC.A.4 and PC.9.9), SGRE's view is:** Regarding the chapter PC.A.9.9 "EMT Model Performance Specification – PSCAD" SGRE's suggestion would be to move the content into a specific guidance document. Such a guidance document shall be developed within a separate working group due to its complexity. One of the majy or concerns related to the requirements are related to PC.A.9.9.2, where requirements for open, unencrypted models are defined. As EMT models are often based on actual source code and utilize dll's for ~~certain components~~control system (e.g. converter control, dependent on the technology). Requirements to unencrypt parts of such actual source code will come as a conflict, specifically for the developers to protect their IP rights. ~~and t~~The fact that such equipment may be externally sourced, encryption is ~~essential~~ mandatory to live up to IP protection requirements.
21	In terms of the requirement for existing users to provide sub-synchronous torsional data for existing plant that may be provided, do you see any issues in regard to the provision of this data?	

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22	Should responsibility for interoperability remain with the generator or the ESO, inclusive of interoperability studies such as control interactions and SSCI/SSTI studies? Please provide your reasoning.	