NC RfG DC Recommendation:

Annex 7 - Evaluation of responses to the public consultation (17 July until 25 September 2023)
Public Consultation

on

the amendments to the Electricity Grid Connection Network Codes

(NCs RfG and DC)

PC_2023_E_07

Evaluation Report

December 2023
1. INTRODUCTION

This report summarises the responses received to the public consultation on the amendments to the Electricity Grid Connection Network Codes (‘public consultation’), and provides an evaluation of the points raised, in relation to the Agency for the Cooperation of Energy Regulators (ACER) consultation document PC_2023_E_07.

ACER published a Policy Paper1 on the revision of the Network Code on Requirements for Grid Connection of Generators (NC RfG) and the Network Code on Demand Connection (NC DC) in September 2022 (‘ACER Policy Paper’). This document aimed at transparently indicating to stakeholders the key policy areas in which amendments are to be expected. Moreover, the ACER Policy Paper drew on the alternative policy options and provided recommendations and proposed actions for the amendment process.

Following the publication of ACER Policy Paper, ACER ran a public consultation from 26 September until 21 November 2022. The evaluation report on responses received to this public consultation on the amendments to the Electricity Grid Connection Network Codes (GC NCs) has been published on the 17 July 2023 in order to indicate how stakeholders’ views and concrete amendment proposals regarding the two GC NCs: the NC RfG and the NC DC were assessed.

Within this evaluation context, ACER formed its amendment Proposal on the two GC NCs and carried out another public consultation between 17 July and 25 September 2023, inviting all interested stakeholders to provide any comments on the Proposal. The consultation resulted in a total of 94 responses (56 for NC RfG and 38 for NC DC) provided by 62 stakeholders (ENTSO-E, EU DSO and European energy stakeholders representing the industry across Europe). The list of respondents is available on ACER’s website, alongside their responses2. In the present document we explain how the responses received have been taken into account for the network codes’ amendment. The steps following the results of this public consultation are also outlined in this document.

The stakeholders proposed amendments mainly concerning the following policy areas:

- Technical requirements for pump storage hydro power generating modules (PMGs);
- Determination of significance of PMGs;
- Determination of mixed customer sites (MCS);
- Requirements for type A PGMs;
- Significant modernisation of system users’ facilities and equipment;
- Requirements for storage and electromobility;
- Simulation models and compliance monitoring;
- Advanced capabilities;
- Weather hazard resilience;
- Active customers and energy communities;
- Units providing demand response services;
- Improvement of the applicable rules and procedures;
- Demonstration of compliance.

2. EVALUATION OF RESPONSES

Following the close of the public consultation, ACER assessed stakeholders’ views regarding amendment proposal on the two GC NCs: the NC RfG and the NC DC.

Below we provide a summary and analysis of the responses received, organised by policy area. It should be noted that the following tables provide the responses received in the 2023 public consultation and focuses on the key issues raised by the respondents.
Abbreviations

CDSO: Closed Distribution System Operator
DSO: Distribution System Operator
EG CSM: Expert Group criteria for significant modernisation
ENTSO-E IGD: ENTSO-E Implementation Guidance Document
EV: Electric vehicle
EVSE: Electric vehicle supply equipment
FON: Final Operational Notification
FRT: Fault ride through
GC ESC: Grid Connection European Stakeholders Committee
ION: Interim Operational Notification
LFSM-UC: Limited Frequency Sensitive Mode -Under frequency for consumption
MCS: Mixed Customer Site
NC DC: Network Code Demand Connection
NC RfG: Network Code Requirements for Generators
PGF: Power Generating Facility
PGM: Power Generating Module
PPM: Power Park Module
RES: Renewable energy sources
RoCoF: Rate of change of frequency
RSO: Relevant System Operator
SO GL: Guideline on electricity transmissions system operation
SPGM: Synchronous Power Generating Module
TSO: Transmission System Operator
### 3. REQUIREMENTS FOR PUMP-STOREAGE HYDRO PGMS

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<tr>
<td>NC RfG</td>
<td>ENTSO-E, Fingrid Oyj, WindEurope</td>
<td>Article 6(2)(e)</td>
<td>The stakeholders propose the possibility to agree on a different value to be added as the current provision may challenge processes in certain Member States where pumped hydro PGMs are used during the system restoration to stabilise the island with frequency that could go below 49Hz for a limited time. The stakeholders also propose to include the word “frequency” for the higher value.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Terna Spa</td>
<td>Article 6(2)</td>
<td>As regards paragraph 2(e), the stakeholder argues that only pump-storage power-generating modules with fixed speed machines and single shaft ternary machines have problem to remain connected below 49 Hz. As regards paragraphs 2(f), (g), (h), (j), (k), the stakeholder argues that non-applicable requirements should be verified with the definitive numbering of paragraphs. For pumping operation mode the reference to 17(3) is unclear.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>VGBE</td>
<td>Article 6(2)</td>
<td>The stakeholder argues that in the NC RfG an obligation for synchronous compensation mode is introduced only for Pump Storage Hydro technology, not for any other rotating technology e.g., DFIM Wind Farms or conventional power plants. Since synchronous compensation mode is also a special operation for Pump Storage Power Plants, additional investments e.g., for blade cooling, must be done, even if the mode is not used by the relevant system operator. Therefore, the reference to the synchronous compensation mode is removed from Article 6(2).</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Eurelectric, EDF</td>
<td>Article 6(2)</td>
<td>The stakeholders argue that it seems that there is an inconsistency between point 6(2)(d) and 6(2)(f) regarding pump-storage assets, so it is not clear what to take into account.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>VGBE</td>
<td>Article 13(2)</td>
<td>The stakeholder proposes to add a provision that the rate-of-change-of-frequency withstand capability should respect the safety aspects imposed by the technology of the PGM as agreed between the TSO and the operator of the PGM, because for hydro installations the inertia of the fluids does not allow high values of the RoCoF.</td>
<td>Partly agree</td>
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### 4. Determination of Significance of PGMS

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<tr>
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<tr>
<td>NC RIG</td>
<td>EUGÉNE, EUROPGEN</td>
<td>Recital (9), Article 2(9)</td>
<td>The stakeholders consider that with the existing text, the case of a synchronous machine which can be operated independently from others is left ambiguous – further wording changes are needed, as proposed. The word “individual” is key – it is essential to include wording that clarifies the classification of a synchronous machine should be based on the individual machine capacity where they can be operated independently, not the whole capacity of the installation and not the aggregation of multiple synchronous power generating units.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Undisclosed stakeholder</td>
<td>Article 5</td>
<td>The stakeholders consider that the determination of significance of power-generating modules should not depend on voltage level as this does not affect the generator type. Instead, it recommends determining PGMS based solely on their maximum export power capacity or nominal export power in order to cover behind-the-meter assets as most of the time, the generator is connected behind a transformer that will affect the power quality of the system. In addition, the stakeholder suggests simplifying existing rules by setting out only three types of PGMs: A, C, and D, eliminating category B. The stakeholder suggests that Table 1 is amended accordingly in order to reflect the suggested simplification of determination of significance for PGMS.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>VDMA e.V.</td>
<td>Article 5</td>
<td>The stakeholder proposes to fix the limit for maximum capacity threshold from which a PGM is of type B at 0.5 MW for Continental Europe and Baltic.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>ENTSO-E, VGB, Osterreichs Energie</td>
<td>Article 5</td>
<td>The stakeholders propose the following two modifications of the legal text: 1) the use of park instead of vehicle and 2) the change of the threshold. 1. The maximum capacity for V2G is defined at V2G electrical charging park level and that those are identified as ESM (see comment on definitions) to ensure they comply with the same requirements than PGMs (the introduction of specific differentiated requirements should not be the default rule). The collection of EVs behind a same connection point that constitute a charging park shall be aggregated when the total capacity of the charging park is above a threshold. 2. With regard to the threshold, ENTSO-E sees the benefits of aligning the requirements of installations above the A/B threshold with SO GL requirements applicable to significant grid users (esp. on data exchanges). For this reason, ENTSO-E believes the threshold of 1 MW has to be changed to the A/B threshold defined at national level. Stakeholders propose that it shall be possible to decrease the threshold below which the voltage is not taken into account down to 5 MW regardless of the existing national BC or C/D thresholds. Another stakeholder proposes to increase the threshold below which the voltage is not taken into account to 25 MW. Stakeholders state that the A/B threshold is harmonized to a maximum of 500 kW, whereas it seems illogical that the threshold for EV3 goes up to 1 MW.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>Applicable NC</td>
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<tr>
<td>NC RIG</td>
<td>ENTSO-E, EU DSO, VGBE, CENELEC, undisclosed stakeholder, IFIEC</td>
<td>Article 5</td>
<td>The stakeholders argue that the reduction of upper limit for type A/B from 1 MW to 0.5 MW will have a significant impact on retrieving high-quality forecast data from Significant Grid Users (SGUs) as required in SOGL, because SGUs are defined in SOGL as B, C and D PGMs or RfG. This would result in significant increases in resource from TSO, DSOs and connected parties for enabling this increase of data exchange. The impact on SOGL should be addressed either in RIG 2.0 or in next version of SOGL.</td>
<td>Partly Agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>VGBE, COGEN Europe, IFIEC, KCORC</td>
<td>Article 5</td>
<td>One stakeholder proposes to increase voltage criteria at the connection point for all types. Other stakeholders propose to exclude PGMs embedded in the network of industrial sites or in case of Combined Heat and Power facilities, from the voltage level criteria. Another stakeholder considers that the 110 kV criterion needs to be abolished completely, or alternatively, proposes to establish a threshold at 110 kV. The voltage criteria for new PGMs would create additional investments for industrial sites connected at a voltage level in the range 110 kV - 330 kV if the existing transformers HV/MV were not designed in the past according to the imposed voltage requirements.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>National Grid ESO</td>
<td>Article 5</td>
<td>The stakeholder states that this section that relates to the “Determination of Significance” is quite difficult to interpret, and that the proposal for a threshold at 110 kV does not capture the important impact on industrial sites connected to the 380/400 kV grids, as this could influence the deployment of assets of type B (such as PV and wind). The voltage criteria for new PGMs would be treated as different than the current 380/400 kV criterion, which is quite difficult to interpret, and does not capture the importance of the impact.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Gunnar Kaestle</td>
<td>Article 5</td>
<td>The stakeholder proposes to reshape the limits of thresholds between different types that follow topological boundaries, e.g., the LV/MV substation or the MV/HV substation. The stakeholder emphasises that it is important that these follow topological boundaries, e.g., the LV/MV substation or the MV/HV substation. However, the proposal for a threshold at 110 kV does not capture the important impact on industrial sites connected to the 380/400 kV grids, as this could influence the deployment of assets of type B (such as PV and wind). The voltage criteria for new PGMs should be treated as different than the current 380/400 kV criterion, which is quite difficult to interpret, and does not capture the important impact.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Solar Power Europe, Bundesverband Solarwirtschaft e.V.</td>
<td>Article 5</td>
<td>The stakeholders consider that Continental Europe harmonisation is crucial for a cost-effective energy transition, especially regarding mass-market products. Therefore, a harmonised type A/B threshold is proposed. As the effort is increasing rapidly, and the market segment is very sensitive to time and cost, a project with a high impact would be proposed, resulting in a range of 300 – 500 kW for the type A/B threshold to be defined on the national level. For the sake of requirements in mass-market products and limitation of site-specific notification efforts, one stakeholder proposes to Table 1 to introduce a lower limit of 300 kW for the threshold be proposed, resulting in a range of 100 - 500 kW for the type A/B threshold to be defined on national level.</td>
<td>Partly agree</td>
</tr>
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</table>

ACER understands that there are certain aspects that do not advocate in favour of the reduction of the type A/B threshold, as more onerous compliance regime and data exchange requirements would apply to higher number of PGMs. Furthermore, the harmonisation of banding values or the introduction of a minimum threshold between types A and B would bring the alleged economies of scale only if combined with associated full harmonisation of type A requirements. Therefore, ACER has reconsidered the reduction of A/B threshold and reverted to the previous limit of 1 MW. In addition, ACER notes that the maximum capacity thresholds according to Article 5(2)(b) are specified by each relevant TSO.

Concerning the voltage criteria see the replies above and below.
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<td>NC RIG</td>
<td>Terna Spa</td>
<td>Article 5</td>
<td>The TSO fully supports the ACER proposal not to harmonise the banding value among type A/B PGMs. Indeed, ceteris paribus, a simple harmonisation to an higher threshold would negatively affect those TSOs, that currently apply a lower band among type A/B PGMs because of specific system needs. However, if strongly requested by many stakeholders, a certain harmonisation of the threshold (up to not more than 100 kW) might be acceptable if accompanied by the extension of some requirements, currently applied to Type B PGMs, also to Type A PGMs. Particularly, in this case, type A PGMs should satisfy at least the following additional requirements (to be added or confirmed compared to the version under consultation): - FRM mandatory for PPMs an EVs with Uret of &gt;15 kW and type A 0.05 (in Article 1a for EV and Y.4 for PPM); - Voltage control system and reactive power capability; - The power generating module shall be equipped with a communication interface.</td>
<td>Partly Agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>EDP, CEZ, Eurelectric, Enel Group</td>
<td>Article 5(2), Article 5(3), Article 5(4)</td>
<td>Stakeholders suggest that in point (b) the proposals for defining thresholds between types of power-generating modules shall be subject to approval by the relevant regulatory authority or, where applicable, the Member State. In developing the proposals, the TSO shall coordinate with relevant DSOs and conduct a public consultation. One stakeholder proposes that in accordance with Article 10 Relevant System Operators and relevant TSOs shall carry out a public consultation, in coordinated manner among them, including also competent authorities of each Member State and taking into account the views of the stakeholders.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Better Energy</td>
<td>Article 5</td>
<td>The stakeholder commented that in Table 1, Type C, Continental Europe: For technical requirements it could easily be 0.5 MW or lower, but the compliance documentation requirements for Type A, should be increased up to 1 MW. The stakeholder did not introduce a proposal for the amendment of this article.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Undisclosed stakeholder</td>
<td>Article 5(6)</td>
<td>The stakeholder suggests that it should be made clear that the EVSE is subject to certification, not the EV inverter.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>EDF</td>
<td>Article 5</td>
<td>The stakeholder considers that ACER’s proposal regarding the thresholds between categories is quite adequate. However, it is suggested to smoothen the thresholds effect by not turning directly a power plant into the upper category after a power increase, but rather more with an additional condition: level of active power + power increase bigger than 10%. For example, this would avoid a 74 MW hydro power plant not to make investments by 2 MW as it would become type D category and not C (74 to 76 MW, the threshold being 75 MW) and in fine be positive to the electrical system. On the specific topic of EV and EVSE, the stakeholder suggests the following modifications: As regards paragraph 1 which serves as an introduction for the rest of the article, should consider both the case of the “standard” power-generating modules with ABCD categories (as defined in paragraph 2), and the case of V2G electric vehicles and associated supply equipment below 1MW maximum capacity, with their specific rules for determination of significance (as defined in paragraph 6). As regards EVs in paragraph 6, requirements comparable to category B ones will be applied. Therefore, in order not to distort competition between the different flexibilities, given that a very large majority of Member States has set up a threshold between categories A and B at or above 100 kW, it is necessary to fix a limit between EV2 and EV3 at a value that will allow EV to submit to the same requirements than other flexibilities of the same size. In addition, the stakeholder suggests that it should be clear that the requirements applicable to each individual EV and associated supply equipment should be determined based on its individual capacity, as stated by ACER in the different workshops, and not on the aggregated capacity of the electrical charging park connected to the same connection point. The stakeholder proposes modifications to avoid any doubt as to the application of this principle.</td>
<td>Partly agree</td>
</tr>
</tbody>
</table>
1. Several stakeholders argue that it is crucial to allow the flexibility in hybrid installations / mixed customer site types (e.g., PV /Storage / PV/Wind). For these applications, it is important to allow them to be controlled and operated as one system, e.g., to optimise plant operation or keep a maximum power input limit. The suggested change will enable that other electrical equipment, such as capacitor banks and power electronics can be used to fulfill the requirements in the NC RIG (including on the communication which may be used for balancing services). Some stakeholders suggest that the part of this proposal concerning differentiation of classes, in order to ensure consistencies in the current operation of the Member States.

Some stakeholders argue that all non-synchronous power generating units should be aggregated into a single PPM behind a single connection point. The word 'solely' needs to be deleted. Otherwise, it will not be possible to use the capabilities of energy storage and other equipment across more power generating modules.

PV inverters will very likely be used to deliver reactive power for power generating modules with another underlying technologies in hybrid plants. Energy storages are used for other purposes e.g., providing system services, they will still need to fulfill the requirements of the NC RIG. It is crucial to allow use of the flexibility in hybrid installations / Mixed customer sites (e.g., PV /Storage / PV/Wind). For these applications, it is important to allow them to utilise synergies between different underlying technologies.

One stakeholder proposes that the significance of a power generating module be based on their agreed maximum continuous export capacity at the point of connection, and makes a proposal to aggregate capacities of units of same underlying technology only for type A PGMs; allow only electricity storage integrated to a power generating module of Type A.

2. Some stakeholders propose to add a new recital after recital 9: When determining the significance and the capacity of a power generating module, system operators must take into consideration specific site limitations and grid export limitation capabilities to reflect the impact on the electricity system caused by the power generating module.

3. One stakeholder generally agrees with the clarification regarding electricity storage, however notes that it is just one case and NCs should provide general rules and not specific cases. The concern is that whether there could be just a simple rule when additional nonsynchronous generation can be seen insignificant, as in case of solar PV on the roof of a CCGT facility.

4. One stakeholder requests to define the criteria needed to differentiate between (1) a storage installed within a PPM to provide storage capability and (2) a storage used solely for the purpose of meeting the requirements of this regulation (and this synchronous power generating unit and storage are indivisible and create an SPGM). Three stakeholders propose changes to the recital to allow for integrated energy storage units to be used to ensure compliance of SPGMs. Another stakeholder proposes to delete the wording regarding integrated electricity storage.

One stakeholder argues that individual EV2 (home/business or public chargepoints/wallboxes) can be stand-alone V2G assets, but also be aggregated on a certain level. As well as EV3 (DC chargers, as part of a charging park) require aggregation since they all connected to a site level grid connection instead of individual grid connections. The operator remains free in allocation of power and distribution of grid feed-in over the total of the controllable asset base of EV3 assets, and therefore aggregation of V2G active power should be possible on all V2G classified types EV2 and EV3. One stakeholder proposes that the determination of significance should be carried out specific to each class of power generating module, which are photovoltaic, electricity storage, wind energy converter, thermal power installations, V2G electric vehicles or other.

5. One stakeholder proposes to add a provision for non-aggregation of capacities of units of different classes. Another stakeholder proposes to add that the PPM can export electrical energy by different technologies if applicable additionally.

<table>
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<tr>
<th>NC RIG</th>
<th>Recital (9), Article 2(16), Article 2(17)</th>
<th>Article 2(67), Article 5(1)</th>
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<td>store electrical energy by different technologies. Addition of provision regarding integrated energy storage. Another stakeholder proposes that the definition of PPM should allow the flexibility to consider generating units of different underlying technology connected to the same point of connection either as independent PPMs or as one PPM. Concerning Article 5(1), one stakeholder proposes to align it with recital (9). One stakeholder suggests including the words ‘measured at the connection point’ to this paragraph as maximum capacity should be understood at the connection point. It should also be clarified how the initial Pmax is defined (as it is used as a reference to define whether an active power increase is significant or not, for instance). Another stakeholder commented that it should be clarified that if you have more power park modules, it should be allowed for other types of PPMs and other electrical equipment such as capacitor banks to support one specific PPM to comply with these rules. The stakeholder did not introduce a proposal for amendment of this article. One stakeholder recommends that the definition of maximum capacity is clarified in order to better reflect the purpose of PGMs. Indeed, while the general notion of maximum capacity can be understood as an Energy Capacity (in MWh), it’s actually an instantaneous power. One stakeholder proposes to provide that Pmax means 95% of maximum continuous active power, as existing definition drives costs due to very rare operational conditions that may give a high maximum output of a few hours per year.</td>
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### 5. MIXED CUSTOMER SITES

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<tr>
<td>Response refers to: Name of stakeholder(s)</td>
<td>Reference to Article(s) / paragraph(s) corresponding to ACER’s draft NC proposed amendments</td>
<td>Summary of stakeholders’ response</td>
<td>ACER position</td>
<td>Reasoning</td>
</tr>
<tr>
<td>NC RfG Bundesverband Solarwirtschaft e.V.</td>
<td>Article 6</td>
<td>The stakeholder proposes to insert a new paragraph (8) as follows: “For mixed customer sites the following applies: (a) the type classification according to table 1 does not refer to the installed capacity, but the maximum feed-in capacity as agreed with the relevant system operator; (b) if the mixed customer site was taken into operation before the application date of this regulation, the requirements to the power-generating unit may apply at its connection point within the mixed customer site; (c) there shall be the same requirements for the power-generating module regardless if the relevant DSO or connected to demand-dominated mixed customer site.” The stakeholder considers that it makes sense to limit the infeed capacity and focus on self-consumption. The most important impact parameters of a PGM to the network is related to the maximum infeed capacity to the grid, rather than installed capacity. As regards the proposed paragraph 2(b), the stakeholder considers that especially in medium voltage connected existing demand facilities, a reference point at the PCC often leads to significant additional cost for measuring equipment / reconstruction of the switchgear, etc. Such cost may jeopardise investments into such PGMs. A reference point within the MCS - at least for relatively small plants in relation to the connection point’s capacity - is technically feasible. As regards the proposed paragraph (c), the stakeholder considers that the technical requirements with regard to a PGM of the same size should not be different if it is connected to public low voltage grid or a low voltage grid in a mixed customer site connected to the MV grid. For instance, the significance of a 200kW PGM connected to LV may be higher than if it’s connected to MV level within a large demand facility. In practice, today the latter has to fulfill more complex requirements, e.g., due to requirements being related to the connection point at MV level.</td>
<td>Partly agree</td>
<td>PGM requirements should be the same irrespective of whether a plant is connected to a MCS or to the DSO’s network. Furthermore, properly adjusted voltage criteria will adequately reflect significance of smaller PGMs, while still capturing the large PGMs’ impact on the system.</td>
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6. REQUIREMENTS FOR TYPE A PGMS

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<td>NC RIG</td>
<td>EDF</td>
<td>Article 13(2)</td>
<td>The stakeholder requests a clarification regarding Article 13(2)(b)(v): ‘does it mean that the operator needs to trigger the loss of mains protection with the RoCoF criteria?’ The stakeholder proposes to suppress point 13(2)(c): ‘generators are free to choose their own protections for their materials as they will be responsible for it in the end. The stakeholder proposes to delete the new requirement in Article 13(2)(d) regarding the 51.5 Hz-52.5 Hz frequency range. It is not justified and was initially only created to take into account the new RoCoF profile in the over frequency range. No real analysis was performed about it. Requirements should be set after a robust justification of system needs, be subject to cost-benefit analysis (because they can imply huge costs for generators and dier investment) and after assessment of alternative network solutions. In addition, regarding pump-storage assets, this requirement will lead to the request for a derogation, to avoid significant civil engineering work due to risks of water hammers. The stakeholder again underlines that the “Unlimited” requirement for the frequency range 49Hz-51Hz may seem irrelevant, during the 2006 huge grid incident, the frequency has not stayed for more than one hour in the vicinity of 49Hz. This triggers too many constraints and costs compared to its real relevance.</td>
<td>Disagree</td>
<td>Article 13(2)(b)(v) provides that if rate-of-change-of-frequency is used for loss of mains protection, the relevant system operator, in coordination with the relevant TSO, shall specify the threshold of this rate-of-change-of-frequency type loss of mains protection. It is important that protection schemes, other than the loss of mains protection do not jeopardise the frequency ride-through performance as this is a requirement. When a system split occurs, frequency in the over frequency island can transiently overshoot before it is stabilised to a value according to the droop settings. If, during that transient, all generation is tripped due to transient over-frequency, the island will black out, even if it would have been possible to stabilise the frequency below 51.5 Hz. This system behaviour will be aggravated with decreasing system inertia. The proposed modification delays the tripping of the generation during the transient and therefore prevents the island from blacking out. Thus, system resilience is increasing. (see ENTSO-E’s submission to ACER’s 2022 Public Consultation on the amendments to the grid connection network codes). ACER considers that the current provision of Article 13(2) regarding the 52.5Hz requirement sufficiently covers the situations of a transient frequency overshoot. The requirements defined according to the NC RIG regarding the time period of operation for the frequency range of 49Hz to 51Hz do not contradict SD GL provisions, as the latter are referring to system operation and recovery following a disturbance. Furthermore, the time period of operation for the frequency range of 49Hz to 51Hz is in line with the European standards.</td>
</tr>
<tr>
<td>NC RIG</td>
<td>EDF</td>
<td>Article 13(3)(g)</td>
<td>The stakeholder proposes to delete this paragraph, as the required use of TOR signals for LFSM-O may result in legal responsibility topics and cybersecurity issues. In case this paragraph is not deleted, the stakeholder highlights that it is not consistent with point 7.3.1 that puts relevant nuclear safety rules in priority. Indeed, this requirement may endanger the ability of a power plant, for example a nuclear one, to go into islanding mode. Figure XX on the topic of LFSM-O shows an active power increase instead of a decrease. With regard to Article 13(3)(h), in LFSM-O mode, an electricity storage module shall be able to increase its consumption, if possible, or to decrease its generation and switch to consumption, but in no case, to switch from consumption to generation. The wording should be modified as proposed.</td>
<td>Partly agree</td>
<td>As regards nuclear safety, according to Article 7(3)(f), when applying NC RIG, Member States, competent entities and system operators shall take into consideration relevant nuclear safety rules. The TSO in coordination with the RSO shall define the framework conditions for the use of the LFSM-O function. Figure XX refers to the definition of response parameters. ACER has clarified this in the figure.</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Polskie Sieci Elektroenergetyczne (PSE)</td>
<td>Article 13(3)(g)</td>
<td>The stakeholder states that it may be difficult for SPGMs, to meet the requirements specified for LFSM-O dynamics in point 13(3)(g) while ensuring correct, smooth adjustment operation after such an active power setpoint change. From the technical side, active power automation, especially LFSM should operate smoothly, ensuring stable and uninterrupted operation of the PGM. Due to the variety of technologies used and the resulting technical limitations, the stakeholder proposes defining this requirement at the national level. i.e. (g) (i) for synchronous power generating module: less or equal to value agreed between the relevant TSO, the relevant system operator and the power generating facility owner.</td>
<td>Disagree</td>
<td>The new requirements will enhance system security further considering the ramp-up of renewable generation, as demonstrated by the final report of the Baseline for type A power-generating modules Expert Group, created by the GC ESC. Such a new approach would significantly contribute to the EU security of supply level and sustainability, taking into account the ambitious Type A renewable generation development, and reduce the risk of further loss of generation from these units.</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Fingrid Oy</td>
<td>Article 13(3), Article 15(2)</td>
<td>The stakeholder argues that LFSM-O and LFSM-U shall be independent and stackable meaning that the function works seamlessly with possibly active FSM control and has parameters of its own.</td>
<td>Partly agree</td>
<td>Article 15(2)(d) states that FSM shall apply cumulatively with LFSM-O and LFSM-U.</td>
</tr>
<tr>
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<tr>
<td>NC RIG</td>
<td>ENTSO-E</td>
<td>Article 13</td>
<td>The stakeholder proposes to include the 52.5Hz requirement in the Table 2. In addition, it is proposed to amend the requirement as provided in Article 13(12) so that the voltage levels between 1kV and 110kV shall be specified by the RSO.</td>
<td>Disagree</td>
<td></td>
</tr>
<tr>
<td>NC RIG</td>
<td>Oesterreichs Energie</td>
<td>Article 13(12)</td>
<td>The stakeholder proposes the voltage threshold to be changed to 1 kV, since this is the usual threshold for LV or MV connection requirements.</td>
<td>Agree</td>
<td></td>
</tr>
<tr>
<td>NC RIG</td>
<td>VGBE, COGEN Europe, EUGINE, EUROPGEN, EUTrubines, GEZ, Eurelectric, Energie-Nederland</td>
<td>Article 13(2)(d)</td>
<td>The stakeholders argue that a maximum over-frequency of 52.5 Hz is forbidden. The SOGL imposes to respect the frequency ranges of existing PGMs. So, a frequency above 51.5 Hz will never be allowed. One stakeholder (Energie-Nederland) proposes to delete this provision.</td>
<td>Disagree</td>
<td></td>
</tr>
<tr>
<td>NC RIG</td>
<td>VGBE, CENELEC</td>
<td>Article 13</td>
<td>Stakeholders propose amendments regarding Type A requirements. These include: proposal that remote operation of PGM is provided if the PGM operator requests, change the lower frequency for autonomous connection to 49.6 Hz, a droop of 1% is not realistic for LFSM-U ESM (proposed by two stakeholders), to harmonise FRT requirements for type A PGMs.</td>
<td>Partly agree</td>
<td></td>
</tr>
<tr>
<td>NC RIG</td>
<td>COGENEurope</td>
<td>Article 13(3)(b)</td>
<td>The stakeholder proposes that the capability for automatic disconnection and reconnection of power generating modules of Type A at randomised frequencies should be mandatory.</td>
<td>Disagree</td>
<td></td>
</tr>
<tr>
<td>NC RIG</td>
<td>Eurelectric</td>
<td>New article after Article 13(9)</td>
<td>The stakeholder proposes to add a new provision covering requirements for power quality as power quality affects both the consumers, producers and grid components.</td>
<td>Disagree</td>
<td></td>
</tr>
<tr>
<td>NC RIG</td>
<td>EDF</td>
<td>Article 13(11)(e)</td>
<td>The stakeholder suggests that in LFSM-U mode, an electricity storage module should be able to increase its generation, if possible, or to decrease its consumption and switch to generation, but in no case, to switch from generation to consumption. The wording should be modified as proposed (removing the wording ‘vice versa’).</td>
<td>Disagree</td>
<td></td>
</tr>
<tr>
<td>NC RIG</td>
<td>Bundesverband Kraft-Wärme-Kopplung e.V.</td>
<td>Article 13(14)</td>
<td>The stakeholder notes that for FRT in Type A PGM, there is a distinction needed, see EN 50549-1, clause 4.5.3 Under-voltage ride through (UVRT).</td>
<td>Partly agree</td>
<td></td>
</tr>
<tr>
<td>NC RIG</td>
<td>Bundesverband Solanwirtschaft e.V.</td>
<td>Figure XX.b</td>
<td>The stakeholder suggests that the blue time labels should be corrected as they are inconsistent with the RoCoF / delta f values.</td>
<td>Disagree</td>
<td></td>
</tr>
<tr>
<td>NC RIG</td>
<td>Bundesverband Solanwirtschaft e.V., VDE FNII, Aware-France and ATEE, Renault</td>
<td>Figure YY</td>
<td>The stakeholders note that the value of the drop in the figure is inconsistent with the text.</td>
<td>Agree</td>
<td></td>
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</tbody>
</table>

ACER considers that the current provision of Article 13 regarding the 52.5Hz requirement sufficiently covers the situations of a transient frequency overshoot. Regarding the voltage levels, ACER considers that it is recommendable to harmonise voltage ranges for type A PGMs as these are mass market products.

A relevant amendment has been introduced in the NC RIG.
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<tr>
<td>NC RIG</td>
<td>Bundesverband Solarwirtschaft e.V.</td>
<td>Article 13(2)(d)</td>
<td>The stakeholder proposes to rephrase this paragraph to indicate that a power-generating module shall be capable of remaining connected to the network and secure a limited operability, not including power exchange in case of reasonable technological limitations, as for some technologies, providing the power generation dynamics is limited. In the stakeholder’s view, it should be possible to respect those limitations. The stakeholder considers that the modules can stay connected but cannot guarantee a power exchange at this frequency range, as the protection of the facility/module should prevail.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Bundesverband Solarwirtschaft e.V.</td>
<td>Article 13(3)(g), Article 13(3)(h)</td>
<td>The stakeholder proposes to delete part of this paragraph and define, under (g)(ii), between 0.7 and 2 seconds for an active power setpoint change of 50% maximum power. The stakeholder considers that the relevant TSO could require the response time to be less than one second, which is not feasible for some technologies of electricity storage modules to stay within this provision. Therefore, the stakeholder argues that it needs to be clarified that the response time cannot be set to less than half a second for electricity storage modules, alternatively via an exception for electricity storage modules of specific types. Additionally, the stakeholder commented that the requirements should not be established by the relevant TSO but by the relevant European entities to ensure a Single Market at least for type A power park modules. As regards the second subparagraph of Article 13(3)(h), the stakeholder suggests deleting the possibility for the TSO to define a different characteristic as they argue that it does not seem clear what the technical rationale behind it is and that, without further reasoning, the complexity should not be increased.</td>
<td>Partially agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>E.ON</td>
<td>Article 13(3)(g)</td>
<td>The stakeholder considers that the DSO with the relevant TSO shall define the framework condition for the use of this function.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Swedenergy</td>
<td>Article 13(3)(c)</td>
<td>The stakeholder notes that Δf1 in Table X is not including range of delta F1 means all connected plants in the same synchronous area will act at the same time. It was also argued that the effect of the system perspective of this change from a range-value to a fixed set value for Δf1 must be taken into account.</td>
<td>Partially agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Swedenergy</td>
<td>Article 13(3)(g), Article 15(2)(c)(ii)</td>
<td>The stakeholder argues that an external signal to change active power mode in real-time is not allowed for type D PGM such as for examples nuclear power plants due to security reasons, which needs to be clarified. To block the LFSM-O function could be done by the plant after agreement with TSO (but not from an external real-time signal).</td>
<td>Partially agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Undisclosed stakeholder</td>
<td>Article 13(2)</td>
<td>The stakeholder does not understand the justification for a time period for operation “unlimited” in the frequency range 49-51Hz when deviations of more than 200 mHz are very rare and brief: such exceptional deviations are either corrected fairly quickly with exceptional corrective measures, or in the worst case, can lead to a blackout quickly if the measures have not made it possible to stop the drop in frequency or restore the frequency. The stakeholder considers that under no circumstances will the system be able to remain for a long period in the extremities of the 49-51 Hz frequency range. To avoid disproportionate requirements for PGMs and to ensure that network code requirements are aligned with network needs, the stakeholder suggests introducing non-unlimited time periods for exceptional deviations of more than 500 mHz, periods that can be specified at the national level.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>AEE</td>
<td>Article 13(3)</td>
<td>The stakeholder considers that figure XX should be clearer. The Y axis should mention “ΔP” instead of “value” and the initial value should be 0% of ΔP. The initial time should be also referred to a step in frequency.</td>
<td>Disagree</td>
</tr>
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<tr>
<td>NC RIG</td>
<td>Bundesverband Kraft-Wärme-Kopplung e.V.</td>
<td>Article 13(3)</td>
<td>The stakeholder commented that the requirement contained in paragraph (g) is, for the very small units of type A, an unproportional hardship, as the costs of a reliable communication interface per active power to be influenced is very high. In contrast to the requirement of a &quot;logic interface (input port)&quot; according to the current Article 13(6), which can be legally also fulfilled by the existing overvoltage protection in the PGM combined with the voltage regulator on-line tap charger for use in emergencies, a dedicated extra communication channel is needed. The stakeholder suggests that this requirement should only apply to larger PGMs of type B and above, and that an exemption to this requirement is added for micro CHP (up to 50 kW, see EED) and other rotating machinery, and use the same requirement for the response time as for synchronous generators. Instead of the capability referred to in paragraph (a), the relevant TSO should allow within its control area automatic disconnection and reconnection of power generating modules of type A at randomised frequencies for disconnection, ideally uniformly distributed, above a frequency threshold, and with a randomised time delay for reconnection as determined by the relevant TSO. The stakeholder also proposes that ACER should have the right to specify the response time as for synchronous generators.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Bundesverband Solawirtschaft e.V.</td>
<td>Article 13(4)</td>
<td>The stakeholder pointed out that the references to the relevant paragraphs are incorrect.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Bundesverband Kraft-Wärme-Kopplung e.V., Gunnar Kaestle</td>
<td>Article 13(7)</td>
<td>The stakeholders suggest using the term &quot;logic interface (input port)&quot; as in Article 13(7) as the currently used logic interface is the more general term and it allows a broader solution space, including simple relays which may be triggered by some kind of digital or analogue communication channel. If the DSO needs to activate this option for remote control, it would be of a delta value or a setpoint.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Bundesverband Solawirtschaft e.V.</td>
<td>Article 13(7)</td>
<td>The stakeholder suggests replacing &quot;reduce&quot; by &quot;limit&quot; as they consider that this signal specification is ambiguous. Reduce can mean it shall reduce the power by a delta value or a setpoint and what seems to be meant it that the output power is limited. The stakeholder also proposes that ACER should have the right to specify requirements for equipment after consultation with the relevant stakeholders. The stakeholder commented that to establish a level playing field for all European manufacturers in the Single European Market, one European communication standard should be established. Individual standards by TSOs would lead to extensive market fragmentation. In the US, the adoption of the IEEE 2030.5 communication standard has led to significant harmonisation and consumer benefit.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Bundesverband Kraft-Wärme-Kopplung e.V., Enercon</td>
<td>Article 13(8), Article 13(9)</td>
<td>The stakeholders suggest that this synchronising conditions only apply with power generating units. If the generator works as a voltage source with a defined rotating voltage vectors, this is in many cases not implemented as in current sourced converters, asynchronous generators, or CHP engines that are started via the generator. The stakeholder suggests referring to the clauses in EN 50049-1:2019 that deal with synchronisation (clause 4.10) or reuse the described concept of starting power generation.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>WindEurope, Enercon</td>
<td>Article 13(8), Article 13(9)</td>
<td>The stakeholders propose to delete the provision about adjustable observation time as observation time is undefined. Furthermore, &quot;observation time&quot; is not applied in the conditions for automatic connection in Article 13(9).</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Bundesverband Solawirtschaft e.V., Enel Group</td>
<td>Article 13(9)</td>
<td>The stakeholders note that the references to the relevant paragraphs are incorrect.</td>
<td>Agree</td>
</tr>
<tr>
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<tr>
<td>NC RIG</td>
<td>AEE</td>
<td>Article 13(8) and (9)</td>
<td>The stakeholder suggests that the words “taking into consideration the availability of primary resource” should be added, as in the case of PPM, the technical capability to connect to the network depends on the availability of primary resource. The stakeholder adds that the concept “Observation time” should be defined.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Undisclosed stakeholder</td>
<td>Article 13(11)</td>
<td>The stakeholder notes that compared to the current normative and national requirements, this paragraph proposes a significant change in Tresp time and droop settings. Currently, the minimal value of Tresp is 1s for DP=100%Pn is required by the German VDE-ARN 4105 and EN 50549-1. Further decreasing the response time could affect currently available products in the sense that some modifications would be required on the level of a converter. Proposed changes in the default values of droop and the required range of droop settings correspond to the requirements defined in Great Britain’s regulation, and it is not aligned with European EN 50549-1 and the requirements of other countries. The mentioned parameters should correspond to the European standard EN 50549-1.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Bundesverband Solarwirtschaft e.V.</td>
<td>Article 13(11)</td>
<td>The stakeholder proposes to adjust the droop to be between 1% and 5% as very low droop settings may lead to instability of the grid. Also, the stakeholder adds a sentence to clarify that an increase of the active power setpoint of the ESM shall not influence the active power output of the ESM as long as the frequency is lower than the frequency threshold. The stakeholder considers that an operational setpoint change of an ESM should be neglected once the frequency threshold is crossed, as long as the frequency returns, this is a difference in relation to FSM.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Better Energy</td>
<td>Article 13(11)</td>
<td>The stakeholder suggests introducing additional wording to this sentence to require that Pmax in the grid connection agreement or as agreed between the relevant system operator and the power-generating facility owner is also taken into consideration. The reason for this suggestion is, that if you have consumption and provide storage to this installation and you look at the graph, then you must produce active power. Then the question is that, if an owner has a consumption meeting installation and with this requirement needs to deliver active power into the grid, the owner should then buy a production access to the grid as well. If active power is delivered to the grid more than 5 minutes in one month it is seen as a production unit and power-generating module according to Article 3(2)(b).</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Bundesverband Solarwirtschaft e.V., VDE FNN.</td>
<td>Article 13(12)</td>
<td>The stakeholders propose a sentence to be inserted in this paragraph to clarify that the actual active power does not necessarily have to be maintained. Also, at least for LV installations at 400V, the stakeholders suggest that it should be clarified that nominal power does not have to be provided down to 0.85 p.u. voltage.</td>
<td>Disagree</td>
</tr>
</tbody>
</table>

Paragraphs 8 and 9 of Article 13 refer to the technical capability of the PGM to connect to the network, providing the connection conditions. The availability of primary resource is an operational issue. ACER does not consider necessary to define observation time, as the term is already used in the current ENTSO-E IGD on Autonomous connection / reconnection and admissible rate of change of active power.
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<tr>
<td>NC RIG</td>
<td>Solar Power Europe</td>
<td>Article 13(3),(7),(10),(11)</td>
<td>The stakeholder states that as regards Article 13(3)(g)(i), the relevant TSO could require the response time to be less than one second, which is not feasible for electricity storage modules today (which will fall under this provision). Therefore, it needs to be clarified that the response time cannot be set to less than one second for electricity storage modules, alternatively via an exception for electricity storage modules. Additionally, the requirements should not be established by the relevant TSO but by the relevant European entities to ensure a Single Market at least for type A power park modules. Article 13(7) requirements should only apply to type B power-generating modules or bigger and not to small type A units, type A units are typically found in household level storage systems. The requirements that the TSO can impose will be costly to implement and would pose an unnecessary burden on European consumers. As regards Article 13(10), the stakeholder notes that it is ok to stipulate reactive power capability for type A, however, &quot;voltage control&quot; is not well defined. What seems to be meant is reactive power control functions. Those mentioned today just for type C PGMs in Article 21 should become the reactive power control modes already for type A PGM. Voltage control (continuous fast control with fast fault current) may be stipulated as a substitute for grid forming capability for small PPMs. Specifying the reactive power provision from PPMs when importing active power (e.g., from PV at nighttime) leads potentially to additional power losses and inefficiencies. If reactive power is needed in such situations, it should be obtained via the mechanisms of the Directive (EU) 2019/944 as a non-frequency ancillary service. As regards Article 13(11), the stakeholder notes that the relevant TSO could require the response time to be less than one second, which is not feasible for electricity storage modules today (which will fall under this provision). Therefore, it needs to be clarified that the response time cannot be set to less than one second for electricity storage modules, alternatively via an exception for electricity storage modules. Additionally, the requirements should not be established by the relevant TSO but by the relevant European entities to ensure a Single Market at least for type A power park modules.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Terna Spa</td>
<td>Article 13(3), Article 13(7)</td>
<td>The stakeholder argues that in LFSM-O, Electricity Storage Module should have the same response time as in LFSM-U which is defined in Article 13.11.e. In paragraph 7, the stakeholder suggests that the TSOs should be involved in the specification of the requirements for equipment to operate remotely a PGM.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>VDE FNN</td>
<td>Article 13(3), Article 13(7)</td>
<td>The stakeholder argues that there must be a uniform interface for communication in Europe. The DSO with the relevant TSO shall define the framework condition for the use of this function - not the other way around 2nd paragraph (&quot;The relevant TSO may define a different characteristic&quot;). However, another point that increases the complexity between Member State implementation, especially if storage is integrated into a PPM.</td>
<td>Disagree</td>
</tr>
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</table>

The specific provisions for LFSM-O adequately describe the response time for active power decrease in case for increasing frequency for SPGs and PPMs. This provision also covers the option for slower response. The capability to cease active power within 5 seconds is currently required for type A PGMs in NC RIG. ACER proposes this capability be replaced with the capability to reduce active power output, as this is to the benefit of the system users and system security. ACER agrees to provide clarity with regard to the reactive power control modes. This requirement could help to increase the penetration of distributed generation. ACER agrees that longer response times should be possible in case it is technically justified.

The NC RIG could not possibly include every detail. However, one could refer to ENTSO-E’s Implementation Guidance Document on real-time data and communication which serves national implementation for network codes on grid connection. This document states the following: “In order to create a seamless, efficient and secure information exchange it is necessary to apply harmonized standards at various stages, as the number of entities and/or parties is dramatically increased: TSOs, DSOs, RSO, Grid Users, Third party service provider s etc. The ENTSO-E recommended standards to be applied for market related and structural data exchange of information can be found on ENTSO-E website via the following link: https://www.entsoe.eu/major-projects/common-information-modelcom/Pages/default.aspx Recommendations on applicable standards for information security and best practice on handling confidential information can be found in the IEC 62351, ETSI X.501 as well as the ISO27000 standard series. The global best practice recommended to be applied can be found in the following report: Smart Energy Grid – Coordination Group Cyber Security & Privacy, SEG-CG/CSP- Draft Report V07.pdf.”

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<tr>
<td>NC RHG</td>
<td>VDE FNN</td>
<td>Article Y(1)</td>
<td>The stakeholder argues that PPM cannot detect whether the voltage drop is caused by a disturbance in distribution network (to which most of the PPMs are connected to) or in the overlaying transmission network. The stakeholder proposes the following: 'The power park module shall be capable of staying connected to the network and continuing to operate stably after the power system has been disturbed by faults according to a voltage against-time-profile in line with Figure 3 at the connection point and with the set points in Tables X.2.1 and X.2.2.'</td>
<td>Disagree</td>
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</table>

Fault ride through is a requirement in relation to secured faults on the transmission system only.
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<td>NC RIG</td>
<td>ENTSO-E</td>
<td>Article 4a</td>
<td>The stakeholder notes that reference to ‘successive modernisation’ may introduce potential difficulties because it is not clear what is the baseline for these successive modernisations steps, and it should be removed. Therefore, the stakeholder recommends using the ENTSO-E proposal with regard to significant modernisation (which is based on the EG report).</td>
<td>Disagree</td>
<td>ACER's proposal suggests that each Member State elaborates in a single decision (which could be the same as the one regarding the other requirements of general application) the criteria for significant (including successive) modernisation based on the general criteria (electrical characteristics, ranges of modification) defined in the NC RIG as well as the requirements of the GC NCs that should apply, as well as whether the existing connection agreement needs to be revised or replaced.</td>
</tr>
<tr>
<td>NC RIG and NC DC</td>
<td>ENTSO-E, EU DSO, COGEN Europe, EUTurbines, WindEurope, Iberdrola, ACCIONA, EU/P&amp;G, Solar Power Europe, Iberdrola, ACCIONA</td>
<td>Article 4, Article 4a</td>
<td>The stakeholders suggest that where parts are added or replaced for an existing PGM or transmission connected demand or distribution facilities those new parts should be compliant with the requirements of the GC NCs, not limiting the eventual compliance of the PGM. If compliance with the GC NCs is required in the future. Maintenance activities or spare parts are not concerned. One stakeholder proposes that the proposal shall be agreed with relevant DSOs. Proposal to include in the criteria change to the software, modification associated to carbon emission reduction and efficiency improvement and change of components due to aging. Several stakeholders request the removal of the criteria for change in frequency stability and active power management capabilities. Some stakeholders propose to remove the words ‘and active power management capabilities’ as a change in active power management capabilities should not lead to having to comply with the new regulation. Improving active power management capabilities (e.g., enabling active power control by blade-pitching or advance PPC function) to allow participation in ancillary services such as secondary frequency control. One stakeholder states that the use of the replacement of a percentage of the equipment comprising that distribution system as a criterion for modernisation is unclear and impractical.</td>
<td>Disagree</td>
<td>The compliance of new parts should be required so as not to prevent compliance with the GC NCs in the event of subsequent additional modifications. If the addition, as requested by several stakeholders, replacement of a part / component does not trigger a significant modernisation criterion and if the compliance of the new part / component implies the need to retrofit other parts of the PGM / demand facility, the compliance of this new part should not be required. In addition, TSOs shall develop proposals for defining significant modernisation and can propose additional criteria. According to the Expert Group Criteria for significant modernisation (EG CSM) the key electrical characteristics of power generating modules are the maximum capacity of the module, its reactive power capability and its inertia, or other appropriate intrinsic characteristics which affects its stability. Furthermore, ACER proposal sufficiently describes the roles of the TSOs, and the DSO(s) and it is based on the EG CSM final report. Also, regarding the active power management, which is based on the EG CSM final report, Article 4a includes provisions for defining significant modernisation of PGMs and not individual units. However, according to paragraph (3) of Article 4a, the TSO's proposal shall specify the requirements of the NC RIG that shall apply to the entire modernised power-generating module or only to the modernised part of the power-generating module.</td>
</tr>
<tr>
<td>NC RIG</td>
<td>CENELLEC, EUTurbines</td>
<td>Article 4a</td>
<td>The stakeholders argue that according to the provision of paragraph 3, an existing PV plant needs to be updated to the new RIG requirements if, at the same point of connection, a second PV Plant is connected. As all PV plants at one connection point are seen as one PPM, this second PV plant would not be considered as a separate PPM, but it would be considered as a significant modernisation of a one PPM resulting in the need to update the existing plant.</td>
<td>Disagree</td>
<td>Article 4a includes provisions for defining significant modernisation of PGMs and not individual units. However, according to paragraph (3) of Article 4a, the TSO’s proposal shall specify the requirements of the NC RIG that shall apply to the entire modernised power-generating module or only to the modernised part of the power-generating module.</td>
</tr>
<tr>
<td>NC RIG and NC DC</td>
<td>Finnish Energy</td>
<td>Article 4a</td>
<td>The stakeholders notes that there are risks of widely varying implementations between Member States and care should be taken that every Member State acts in a same way, to achieve better consistency in the EU area.</td>
<td>Partly agree</td>
<td>ACER acknowledges that the implementation can vary among Member States. However, at the same time, the proportionality and subsidiarity principles need to be observed. It should be noted that the banding values (thresholds for determining the significance of the PGMs), affecting the implementation of the provisions on significant modernisation, are set at the Member State's level due to these principles.</td>
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### Applicable NC

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<tr>
<td><strong>NC RfG</strong></td>
<td>Article 4a(2)(b)</td>
<td>One stakeholder proposes that the range for a deviation from the reactive power capability of the PGM should be 5-30%. Two stakeholders propose a range of 15-20%. Some stakeholders suggest that the range should be proposed by the TSO. One stakeholder proposes to delete this paragraph altogether. As regards reactive power, a few stakeholders propose a minimal high value (at least 10%), otherwise, any change including an improvement in the reactive power capability would lead to a substantial modification, and thus the investment may not be made. One stakeholder proposes an increase of the reactive power capabilities should be a criterion for significant modernisation and a minimum percentage to be defined in the range 10-20%. A few stakeholders proposed paragraph (b) be deleted or replaced with “30 - 50%”. One stakeholder proposes “20% or above”. One stakeholder proposes X be significantly larger than zero.</td>
<td><strong>Partly agree</strong>&lt;br&gt;As no uniform solutions were provided by stakeholders, ACER agrees on prescribing the proposed minimum percentage of deviation from the reactive power capability leading to a “significant modernisation” be chosen from the range 10-20%. It should be noted that, regarding the reactive power capabilities, according to paragraph (3) of Article 4a, TSOs shall specify in their proposal the requirements of the NC RfG that shall apply to the entire modernised power-generating module or only to the modernised part of the power-generating module.</td>
</tr>
<tr>
<td><strong>NC RfG and NC DC</strong></td>
<td>Article 4(a) RfG Article 4(a) DC</td>
<td>As regards the NC RfG, the stakeholder argues that there are now new criteria related to “Significant Modernisation”. Some of these criteria are quite strict, for example a change of components / assets of a power generating module apart from maintenance and repair activities and spare parts. In theory a plant failure may require a new part, but the new part may not be identical to the failed component. It is suggested this is reviewed as, potentially, an existing plant could make a relatively small change which would then be caught by the requirements of RfG 2.0. This could have the unintended consequence of making that plant uneconomic hence resulting in premature closure. As regards the NC DC, the stakeholder argues that there are now new criteria related to “Significant Modernisation”. Some of these criteria are quite strict. It is suggested this is reviewed as, potentially, an existing demand user through a relatively small change could be caught by the requirements of DC 2.0. This could have the unintended consequence of making that plant uneconomic hence resulting in premature closure. For distribution systems which have evolved over many years, this could be particularly challenging.</td>
<td><strong>Disagree</strong>&lt;br&gt;As provided in Article 4(a)(2)(d), maintenance and repair activities are out of scope of modernisation.</td>
</tr>
<tr>
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<tr>
<td>NC RIG</td>
<td>Solar Power Europe, Iberdrola, ACCIONA</td>
<td>Article 4a</td>
<td>The stakeholders suggest that to install external compensation solutions (e.g., a STATCOM at the PPM substation) to allow or enhance participation of a PPM in ancillary services such as voltage control. Stakeholders propose, in 4a (2), to delete the sentence “In the proposal, TSO can propose additional criteria defining a significant modernization,” and in 4a(3) add in the end: “In case of PPMs the requirements of this Regulation shall only apply to the modernised or new part of the PPM.” As regards paragraph (3), the stakeholders mention that there should be a balance between the cost and the benefit of a need to fulfill the new requirements as a whole, especially when they originate in the Member States grid codes rather than in the NC RfG (e.g., the need to comply with new safety regulations of the switchgear, just because the PGM has more reactive power capability). In any case the new requirements shall be specific to the modernized or new or additional part of the plant. Especially when talking about PPMs: e.g., An existing PPM of 100kW (PV designed according to the existing NC RfG). At the same connection point a new 100kW PV system shall be added. With the NC RfG definitions this would be a 200kW PPM and depending on the TSO it can be defined that the old and the new part of the system must fulfill the new requirements. In such a scenario the new part would just not being built, because of the high costs of exchanging all existing inverters. The stakeholders consider that the existing, old PPMs when subject to modernisation need to comply with the new requirements (e.g., being grid-forming capable, RoCoF), PPM owners will regrettably discard participating in these markets, and TSOs will lose a significant number of potential ancillary service providers already connected in their grids. In addition, deployment of hybrid power plants will be also impacted since a new PPM forming a hybrid installation with an existing PPM, subsequently changes the capabilities of the existing PPM.</td>
</tr>
<tr>
<td>NC RIG</td>
<td>RES Group</td>
<td>Article 4a(2)(d)</td>
<td>The stakeholder proposes that Article 4a(2)(d) should be deleted. Replacement of components/assets should not trigger application of new RIG requirements if the replacement is for the purpose of retaining/restoring the original functions, e.g., replacement of a PV inverter with an identical item or one of substantially equivalent performance.</td>
</tr>
<tr>
<td>NC RIG</td>
<td>EDP, E-REDES, Enel Group</td>
<td>Article 4a(2)</td>
<td>One stakeholder notes that the replacement of a component as per point (d) appears to be deemed as a “significant or substantial modernisation”, even if no technical or other relevant metric changes. The obligation for the PGM to comply with the NC in these cases seems excessive. One stakeholder proposes to modify the text in (d), providing that any intervention, software or hardware in single power generating units, determining a modification of existing capabilities of an existing power generating module. The stakeholders suggest providing that DSOs also can propose additional criteria.</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Bundesverband Solarwirtschaft e.V.</td>
<td>Article 4a</td>
<td>The stakeholder proposes the introduction of a new paragraph (d) as there should be a balance between the cost and the benefit of a need to fulfill the new requirements as a whole, especially when they originate in the Member States Grid Code rather than in the RfG (e.g., the need to comply with new safety regulations of the switchgear, just because the PGM has more reactive power capability).</td>
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As regards the comment on Article 4a(2), it should be noted that paragraph (3) of Article 4a provides that for each criterion, the TSO’s proposal shall specify the requirements of the NC RfG that apply to the entire modernised power generating module or only to the modernised part of the power generating module. Also, the maintenance activities or spare parts are not taken into account for the definition of significant modernisation. When external compensation solutions are applied to an existing PGM which is subject to significant modernisation, appropriate engineering solutions can be undertaken so that some of the existing PGM’s capabilities are brought in line with the NC RfG and if relevant for the provision of ancillary services. In any case, as stated above, according to paragraph (3) of Article 4a, the TSO’s proposal shall specify the requirements of the NC RfG that shall apply to the entire modernised power generating module or only to the modernised part of the power-generating module. It should be noted that paragraph (3) of Article 4a provides that for each criterion, the TSO’s proposal shall specify the requirements of the NC RfG that shall apply to the entire modernised power generating module or only to the modernised part of the power-generating module. Also, the maintenance activities or spare parts are not taken into account for the definition of significant modernisation. Furthermore, it is already stated in paragraph 1 of the same Article that in developing the proposals, the TSO shall coordinate with relevant DSOs.
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<td>NC RfG</td>
<td>ACCIONA, AEE, Iberdrola</td>
<td>Article 4a(2)(a)</td>
<td>The stakeholders propose the value of &quot;20% or more&quot; to the wording of Article 4a (2)(a) as they consider that the minimum percentage value of 5% is too low and typically would include all minor operational optimisation to improve energy yield and would potentially not result in a significant cross-border impact on frequency and voltage stability. Some Member States have already defined this threshold during the national implementation of Regulation (UE) 2016/631. In Spain, for instance, the percentage of power increase has been defined as more than 20%. Therefore, the threshold defined in this amended NC should be closer to this value and not much lower than this.</td>
<td>Disagree</td>
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- It should be noted that paragraph 2(a) of Article 4a provides for the exact minimum percentage to be defined (from the given range of 5-20%) at Member State's level which may also be affected by the banding values (thresholds for determining the significance of the PGMs) set at the Member State's level. In some Member States 5% will be the appropriate threshold while 20% will be the appropriate threshold in others.

| NC RfG        | CEZ, Eurelectric, EDF | Article 4a (new) | A stakeholder proposes Article 4a(2) as to be revised as follows: "an increase above the latest contractual maximum capacity of the power-generating module, whether this increase results from one modernisation or several successive modernisations, of a minimum percentage to be defined in the range 5-20% (newly suggested: 5-30%)" (within this range, different percentages may be defined for different technologies depending on their constraints). The stakeholder considers that additional criteria regarding substantial modification may trigger additional Capex for some projects and thus put undue risk on some investments:
- the range 5-20% for power generating modules (and not installations) may prevent some hydro power plants from investing in improvements on one machine in a multi-machine installation (e.g., +30% on only one machine in a hydro power plant consisting of 5 machines would require compliance with NC RfG v2, even if at the end the Pmax increase would only amount to 30%/5 = 6%);
- The stakeholders propose to delete the criterion c) "change in frequency capabilities", if the performances and electrotechnical capabilities for the TSOs are not changed, it should not lead to substantial modification.
- A request to provide the exact definition of a component has been made. In this context that the criterion (d) should be deleted, or, at least, define exactly "component / asset". Also, a suggestion is proposed to exclude current practices from the modernisation procedure such as generator rewind, change of control system, the transformer, the governor or the automatic voltage regulator. Furthermore, the stakeholders suggest that a change in the main transformer should also be excluded, a modernisation of the remote control (analogue to digital for instance), or a change of primary source of energy (example: coal to biomass, or CH4 to other gasses, or Gas Oil to HVO/bioliquid, etc).
- In addition, one stakeholder requests what is taken into account for the initial value for active power, whether it is during at the moment of the start-up, what is filled in the connection agreement and how is the increasing of the height of the dam (limited to civil engineering works) considered. | Disagree |

- As regards the proposal to consider latest contractual maximum ranges ACER prefers legally sound reference to existing maximum capacity of the power-generating module.
- As regards the minimum percentage ranges, it should be noted that paragraph 2(a) of Article 4a provides for the exact minimum percentage to be defined (from the given range of 5-20%) at the Member State's level which may also be affected by the banding values (thresholds for determining the significance of the PGMs) set at the Member State's level. In some Member States 5% will be the appropriate threshold while 20% will be the appropriate threshold in others.
- As regards frequency capabilities and the comment on hydro power plants, according to paragraph (3) of Article 4a, the TSO’s proposal shall specify the requirements of the NC RfG that shall apply to the entire modernised power-generating module or only to the modernised part of the power-generating module.
- As regards the exact definition of components and exclusion of the main transformer, a modernisation of the remote control (analogue to digital for instance), or a change of primary source of energy (example: coal to biomass, or CH4 to other gasses, or Gas Oil to HVO/bioliquid, etc) or increasing of the height of the dam, ACER disagrees with such an approach as these issues are too detailed to be provided at the level of a regulation as they can be adequately specified, if deemed necessary, in the national framework according to paragraph (1) of same Article.
- As regards the initial value for active power, as provided in paragraph (2)(a), existing maximum capacity of the power-generating module (e.g., as defined in the connection agreement) is to be taken into account. |
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<td>NC RfG</td>
<td>EDF</td>
<td>Article 4a (new)</td>
<td>The stakeholder considers that additional criteria regarding substantial modification may trigger additional Capex for some projects and thus put some risk on some investments: As regards the active power criterion for substantial modification, the stakeholder considers that there is a need to propose a higher upper value (30%) to take into account hydraulic plants containing 3 groups or more where each group could be upgraded separately, with a total effect lower than 10% seen from the connection point.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>CEZ</td>
<td>Article 4a (new)</td>
<td>The stakeholder argues that the general principle should be that the criteria apply only to the modernised part of the power-generating module, hence Article 4a point 3 should be amended accordingly.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Bundesverband Kraft-Wärme-Kopplung e.V.</td>
<td>Article 4a (new)</td>
<td>The stakeholder proposes to modify paragraph (d) and add two new paragraphs as follows: (d) a change of components/assets of a power-generating module or electricity storage module apart from maintenance and repair activities and spare parts, whether or not those parts are purchased anew at the time of their incorporation in the power generating module. This exemption also applies for improved components/assets as long as the electric characteristics are not relevantly influenced; (e) a change of components/assets of a power-generating module or electricity storage module apart from modification that provide momentary or time limited increase of power; (f) a change of components/assets of a power generating module or electricity storage module apart from modification that will foster an increase of power associated to an improvement in the efficiency or emission reduction. The stakeholder requests that if in a fuel cell the stack or within and ICE based CHP unit the motor will be changed with a more modern version, if the whole power generating module need to fullfill the then applicable requirements. If it does, that would be a knock-out criterium for the industry. The exchange of components including repair needs to be addressed more clearly.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>ACCIONA, AEE, Iberdrola</td>
<td>Article 4a(2)(d)</td>
<td>The stakeholders propose an addition to Article 4a to clarify what would be considered as the main generating plant. This criterion has been already well defined by some Member States, e.g., Spain. The stakeholders consider that this should be a relevant reference in the NC to achieve some degree of harmonisation.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Swedenergy</td>
<td>Article 4a(2)</td>
<td>The stakeholder considers that it is not clear whether the modernisation is significant when all points (a-d) are fulfilled, or if only one criterion needs to be met. It is also noted that point (d) implies that changing a component that has no RfG relevance still makes RfG requirements applicable, which is not desirable.</td>
<td>Disagree</td>
</tr>
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</table>

Paragraph (3) of Article 4a provides that for each criterion, the TSO’s proposal shall specify the requirements of the NC RfG that shall apply to the entire modernised power-generating module or only to the modernised part of the power-generating module. Also, the maintenance activities or spare parts are not taken into account for the definition of significant modernisation. It is important for system stability that the modernised PGM supports the electricity system. As to the minimum percentage ranges, it should be noted that paragraph 2(a) of Article 4a provides for the exact minimum percentage be defined (from the given range of 15-20%) at the Member State’s level which may also be affected by the banding values (thresholds for determining the significance of the PGMs) set at the Member State’s level. In some Member States 5% will be the appropriate threshold while 20% will be the appropriate threshold in others. The proposed changes and provisions seem to be unclear and could lead to misinterpretation. ACER also disagrees with such a detailed approach at the level of a regulation as the relevant issues can be adequately specified if deemed necessary, in the national framework according to paragraph (1) of same Article.

Further, according to paragraph 3 of Article 4a, any relevant applicable requirements to meet significance criteria will be specified by the TSO under paragraph (3). It should be noted that each time a criterion of significant modernisation is met, the respective requirements shall apply, in accordance with paragraph (3). Cumulative requirements, as defined in paragraph (3), apply in case more than one criterion is met. Also, according to paragraph (3), the TSO’s proposal shall specify the requirements of the NC RfG that shall apply to the entire modernised power-generating module or only to the modernised part of the power-generating module.
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<td>NC RfG</td>
<td>Energie-Nederland</td>
<td>Article 4a(2)</td>
<td>The stakeholder proposes to provide that in paragraph (c) only an increase of the frequency stability shall be a criterion for significant modernisation; and in (d) only component changes that lead to increased capabilities shall be a criterion for significant modernisation.</td>
<td>Disagree</td>
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</table>

Disagree

It should be underlined that a PGM may be subject to several successive modernisations and these need to be assessed cumulatively to determine whether or not the significant modernisation criterion/criteria is/are met. As regards the active power management, which is based on the *EUCSM final report*, Article 4a includes provisions for defining significant modernisation of PGMs and not individual units. However, according to paragraph (3) of Article 4a, the TSO’s proposal shall specify the requirements of the NG RfG that shall apply to the entire modernised power-generating module or only to the modernised part of the power-generating module.
8. REQUIREMENTS FOR STORAGE, ELECTROMOBILITY, HEAT-PUMPS AND POWER-TO-GAS DEMAND UNITS

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<td>Response refers to:</td>
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<tr>
<td>NC RIG</td>
<td>Undisclosed stakeholder</td>
<td>Recital (s2)</td>
<td>The stakeholder proposes to add at the end of the paragraph: “ensure that Electric Vehicles (EVs) can charge at any time (V1G) regardless their V2G capability”</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Undisclosed stakeholder</td>
<td>Recital (18)</td>
<td>The stakeholder proposes to remove national choices for fault-ride-through capability.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Undisclosed stakeholder</td>
<td>Article 2(2)</td>
<td>The stakeholder proposes to remove/replace the word synchronous from the definition of “synchronous area”.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Undisclosed stakeholder</td>
<td>Article 2(5)</td>
<td>The stakeholder agrees on the need to set out requirements for storage technologies under the NC RIG, it considers that it should be included in the definition of a power-generating module to take into account related technologies under the NC RIG and set out technical requirements according to their actual application.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Undisclosed stakeholder</td>
<td>Article 2 (new definitions)</td>
<td>The stakeholder proposes the introduction of definitions for energy storage, load, generator, and embedded generator not reexporting power.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>BDEW e.V.</td>
<td>Article 2(1)</td>
<td>The stakeholder proposes that in Article 2 first sentence, reference is made to the definitions laid down in the revised NC RIG which is being developed in parallel to the revised NC DC. Further, in the revised NC RIG (draft) there are three definitions which are not being used in the NC RIG but in the NC DC: • V1G electric vehicle • V1G electric vehicle supply equipment • V1G electrical charging park It should be considered to shift these definitions from NC RIG to NC DC.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Undisclosed stakeholder</td>
<td>Article 2(10a), Article 30a and b</td>
<td>The stakeholder suggests that the SED-document should be clarified, especially in relation with type approval for EV3. It intention of SED is to demonstrate the setup of a charging park (consisting of EV3 approved types) It is ok. SED should not include additional requirements for EV3 or charge park.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Energie-Nederland</td>
<td>Article 2(10a)</td>
<td>The stakeholder proposes to add the definitions of EV1, EV2 and EV3.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Undisclosed stakeholder</td>
<td>Article 2(17)</td>
<td>The stakeholder suggests adding examples for more clarity, e.g., PV inverter, chemical energy storage system, etc.</td>
<td>Disagree</td>
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<tr>
<td>NC DC</td>
<td>BDEW e.V.</td>
<td>Article 2(22)</td>
<td>The stakeholder requests to be clarified whether all Modes (Mode 2, Mode 3, Mode 4) are meant. Since Mode 2 is an IC-CPD, which is pluggable and moveable, it should not be in the scope of a demand facility owner or GSO.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>ACCIONA, AEE</td>
<td>Article 2(16), (67)</td>
<td>The stakeholders propose an addition to the definition of ‘electricity storage module’ complementing the proposed language changes for the definitions of Pmax and PPMs in Article 2, paragraphs (16) and (17).</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Undisclosed stakeholder</td>
<td>Article 2(71), Article 2(72)</td>
<td>The stakeholder suggests that it should be made clear that: 1. V1G EVSE equipment function as chargers primary and that primary charging is not impacted at all by the existence of V2G capability of the EVSE or EV. 2. V2G EVSE equipment remains the core function of charging an EV, and that V2G will not impact this core feature at all.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Undisclosed stakeholder</td>
<td>Article 3, Article 6</td>
<td>The stakeholder considers that energy storage units which are pure loads, or embedded generators which commit to not re-export power back into the grid, should always be treated as consumption assets only and, therefore, be exempt from technical requirements covering power-generating modules, except for anti-islanding when they interact with electricity networks in order to ensure human safety. This will enhance the market uptake for such assets which can help decarbonizing the electricity grids at scale. The stakeholders consider that paragraph 1 should be further amended to delete the opportunity for refusal by the SOs in case of no export. Giving such discretion to the SOs will result in disparate treatment across the internal market. There should be a Rule where SOs cannot intervene or refuse the connection of a device in case of a zero nominal export power commitment, and then exceptions to the Rule that allow SO intervention for specific and justified emergencies (there should never be a cost benefit analysis that is poorly defined and does not incorporate decarbonisation and environmental objectives). The Rule should not be one in support of intervention. In this way, planning predictability will promote private investment which is necessary to expand the pool of flexible behind-the-meter assets that are needed to support high variable renewables grids.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>EDF</td>
<td>Article 4a (4) (new)</td>
<td>The stakeholder considers that according to the definitions of article 2, V2G electric vehicles and their associated supply equipment are considered as PGM. As applicable requirements depend on the individual capacity of the V2G electric vehicle and its associated equipment, article 4a concerning significant modernization of PGM is not relevant for V2G EVs and it should be clearly stated that it does not apply to it.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>BDEW</td>
<td>Article 6</td>
<td>The stakeholder considers that there is no need to state that V2G EVs &amp; EVSE must fulfill the NC RfG with respect to electricity consumption. This should be part of the NC DC. The same applies to Article 13a(6)(a).</td>
<td>V2G EVs and associated V2G EVSE are within the scope of the NC RfG.</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Undisclosed stakeholder, Avere-France and ATEE</td>
<td>Article 13a(5)</td>
<td>The stakeholders point out to asymmetrical values of Tresp in LFSM-O and LFSM-U. LFSM-U (0.5 s for 1 pu of P max) and LFSM-O (2 s for 90 % of P max).</td>
<td>The values correspond to those for PPMs which were intentionally set in such a way so that a proper system response is ensured.</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Avere-France and ATEE, Renault</td>
<td>Recital (9)</td>
<td>In order to avoid any confusion in the case of multiple connections of electric vehicle supply equipment to the same grid’s connection point, the stakeholder proposes to add at the end of Recital (9) a sentence: “For clarification, the requirements are applied to both the electric vehicle and associated electric vehicle supply equipment, not to the grid’s connection point.”</td>
<td>ACER acknowledges that the requirement on the “start of active power decrease” is a design parameter and no further interaction with the system operator is required.</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Undisclosed stakeholder</td>
<td>Article 13(3)(e)</td>
<td>The stakeholder considers that if notifications are in place, a PGM should be able to notify a delay in start of active power decrease.</td>
<td>ACER views</td>
</tr>
<tr>
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<tr>
<td>NC RIG</td>
<td>Undisclosed stakeholder</td>
<td>Article 13(2)(b)(iv)</td>
<td>The stakeholder considers that if the rate-of-change-of-frequency is used for loss of mains protection, the relevant system operator, in coordination with the relevant TSO, shall specify the threshold parameter range and align this with a representation of EVSE OEMs of this rate-of-change-of-frequency type of loss of mains protection.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>E.ON, VDE FNN</td>
<td>Article 13a(12) (new)</td>
<td>The stakeholders propose to introduce a new paragraph to this article as follows: ‘Type EV2 electric vehicles and associated V2G electric vehicle supply equipment shall fulfill the following additional requirements in relation to voltage stability: (a) with regard to reactive power capability, the relevant system operator shall have the right to specify the capability of a type EV2 electric vehicles and associated V2G electric vehicle supply equipment to supply and absorb reactive power.’ The stakeholder considers that a contribution to voltage stability is also required from the EV2 (in Germany so far from 12 kVA, this was necessary).</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>EDF</td>
<td>Article 13a(1)</td>
<td>As regards paragraph 1(b)(iii), the stakeholder considers that the missing reference should be clarified. As regards Table XY, the stakeholder requests for the removal of the requirement to withstand during 10s in the frequency range 51.5 Hz-52.5 Hz as it was not technically justified through a Cost/Benefit Analysis.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>EDF, BDEW</td>
<td>Article 13a(2)</td>
<td>One stakeholder (EDF) considers that this requirement to be equipped with a cyber protected data exchange interface is not relevant to EV1 electric vehicles, which are under sized and not economically viable for active power regulation. An alternative proposition could be to deploy an ON/OFF logical port - functionality for EV1. As regards EV2, the same stakeholder considers that the requirement about data exchange interface should be worded in a way that lets the technical solutions open, provided that the same products shall be useable in the different member states of the Union without country-specific hardware adaptations. Such a requirement is indeed consubstantial with the harmonisation effort pushed by ACER on V2G. In the context where there is no standardised solution for a local input port defined by the European system operators yet and their precise needs are not defined as well, the wording should in particular not prohibit a solution that would use the cyber-protected data exchange interface between the EVSE and its associated smart discharging platform to transmit the system operators instructions. If the system operators would finally want to impose solutions based on a local input port for any relevant reason, they shall coordinate to define a standardised solution at European level. The proposed wording allows the two previous options while respecting the key need about harmonisation. The other stakeholder (BDEW) considers that the technology must be open in this case, whether EVSE or EV be equipped with a cyber-protected data exchange interface. Additionally, the V2G electric vehicle can be also equipped with this interface.</td>
<td>Partly agree</td>
</tr>
</tbody>
</table>
The stakeholder considers that the minimum observation time for the EV connection to the electric vehicle supply equipment is not needed. Indeed, if the electric vehicle supply equipment is connected to the grid, it means that the required technical conditions for the EV connection are satisfied. The stakeholder’s concern is to avoid any additional delay for the customer between the EV-EVSE connection and the charging process. The stakeholder proposes that this 5s observation time only apply when the EVSE connects to the grid (1st installation or restart) not when connecting the EV to the EVSE to start a charging session.

Partly agree

The same requirements apply to all other types of PGMs (e.g., solar power plants and electricity storage modules) of comparable small installed capacities.

Agree

Relevant amendments have been introduced in the paragraph (5) of Article 13a of the NC RfG.

Disagree

The minimum observation time after which EVs may autonomously connect to the network is a system requirement to avoid such connections during any ongoing frequency excursions after a system disturbance.

Disagree

The droop setting for V2G EVs and EVSEs needs to be exhaustively defined so that the cross-border mobility and harmonisation are achieved. Moreover, the droop setting at 5% was proposed by several stakeholders during a dedicated ACER public workshop on 17 April 2023 (initial ACER proposal was at 1% but it was deemed too stringent and not needed by the system).

Disagree

A similar requirement applies to PPMs (including ESMs) in Article 13(12).

Agree

The incorrect reference has been amended.

Disagree

Application to existing power generating modules (including EVs and EVSE) is exhaustively provided in Article 4. Moreover, any significant modernisation is addressed in Article 4a.

Disagree

It is clear from the title and the content of Chapter 1 that it applies to the connection of new power-generating modules. The procedures set out in this Chapter do not necessarily apply in full to PGMs which are subject to significant modernisation. Also, Articles 13-28 prescribe for PGMs...
### Applicable NC

#### NC RfG

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<tr>
<td>Avere-France and ATEE, Renault</td>
<td>Art. 13a(2)</td>
<td>As regards EV2, the stakeholders consider that the data exchange interface should be developed under the requirements of the existing and coming international standards and regulations (e.g., IEC 61851).</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Art. 13a(4)</td>
<td>The stakeholder considers that the minimum observation time of 5 seconds is deemed as not needed and might stem additional delays between the EV-EVSE connection and the charging process.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Art. 13a(5)(e)</td>
<td>The stakeholder considers that the 1 pu of Pmax is not clearly defined and the requirement is not understandable.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Art. 13a(6)</td>
<td>The stakeholder considers that, it needs to be made clear, the wording in text and figure 1X is using generation convention (increase of consumption vs. decrease of generation).</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Art. 13a(3), (4)</td>
<td>As regards autonomous reconnection of EV1 and EV2, the stakeholder proposes to keep the same settings as in Article 13.9. The threshold of 50.1 Hz for Continental Europe would facilitate the restoration process in the initial stages. It would mitigate the significant impact that this autonomous reconnection would have on system operation while maintaining the targeted frequency within normal operation ranges. ENTSO-E considers that a threshold of 50.2 Hz is too high since it is the value for entering in emergency state as per SO – GL.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Art. 13a(1)</td>
<td>The stakeholder argues that Table X.Y regarding frequency ranges should contain the outer boundaries of all the synchronous areas. Hence, it is proposed to increase the duration in order to stay connected within this f-range.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Art. 13a(1), 13a(5)(d), 13a(6)(a-e)</td>
<td>The stakeholder proposes the following to be added to the text: &quot;The specifications mentioned here are not an obstacle for the driver/customer to be able to use the vehicle at any time according to his own needs.&quot;</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG, NC DC</td>
<td>Art. 13a(9), Article Y(1) (RIG)</td>
<td>The stakeholder proposes to change the Uret value from 0.15 to 0.05 (pu). Although this value was initially proposed by ENTSO-E for type A PPMs, recent discussion on the minimum threshold of 0.15 pu for type A/B as well as a recent study from Spain, have shown that this value needs to be 0.05 pu in order to avoid large scale tripping of EVs and PPMs in case of faults in the transmission grid. The same is proposed for PRT in NC DC.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RfG and NC DC</td>
<td>Art. 13a(4)</td>
<td>As regards autonomous reconnection after tripping, the stakeholder proposes to add &quot;Autonomous connection is allowed unless specified otherwise by the relevant system operator in coordination with the relevant TSO&quot;</td>
<td>Disagree</td>
</tr>
<tr>
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</tr>
<tr>
<td>NC RIG</td>
<td>ENTSO-E</td>
<td>Article 14a</td>
<td>The stakeholder proposes a high voltage ride through requirement for EV3 to ensure that distributed generation and storage, including EV, do not disconnect during high voltage event. It could be based on the same requirement as for PGMs type B.</td>
</tr>
<tr>
<td>NC RIG</td>
<td>ENTSO-E</td>
<td>Article 48(4)(a)</td>
<td>The stakeholder proposes to remove the part “depending on the energy stored” as this is not relevant for this particular article.</td>
</tr>
<tr>
<td>NC DC</td>
<td>ENTSO-E</td>
<td>Article XX</td>
<td>In line with RIG Article 13a.2, the stakeholder proposes to foresee the capability to disconnect all EV (advanced load shedding plan).</td>
</tr>
<tr>
<td>NC RIG</td>
<td>EU DSO, Österreicher Energie, Terna</td>
<td>Recital (S2), Article 2, Article 5, Article 13a, Article 14a, Article 30a, Article 30b</td>
<td>The stakeholders propose the categorisation of charging points which contain a bidirectional converter as electricity storage modules (ESM) and the creation of a single category of requirements in the RfG for EVs with on board bidirectional converters, thus splitting EVs into AC VDG and DC VDG. Two stakeholders consider that it is important that V1G/V2G electrical charging parks should fulfil additional requirements (on top of V1G/V2G EVs) or be treated as ESMs (e.g., above certain capacity), similar to other PPMs.</td>
</tr>
<tr>
<td>NC RIG</td>
<td>EU DSO</td>
<td>Recital, Article 9, Article 1, Article 2, ...</td>
<td>The stakeholder proposes to remove the notion of an Electricity Storage Module and only define SPGM and PPM as including Electricity Storage, where it exists.</td>
</tr>
<tr>
<td>NC RIG</td>
<td>EU DSO, EDP, Eurelectric, E-REDES, Enel Group</td>
<td>Article 13a(3), (4)</td>
<td>It is important to prevent EVs from reconnecting if the network voltages are outside of the allowable range. A voltage range identical to that for Article 13 is proposed.</td>
</tr>
<tr>
<td>NC RIG</td>
<td>EU DSO, Moeller Operating Engineering GmbH</td>
<td>Article 15(2)(c)(iv), Article 15(2)(d)</td>
<td>The wording needs adjusting and citing the instantaneous active power to replace one instance of maximum capacity and maximum consumption capacity in the case of ESM.</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Energie-Nederland</td>
<td>Article 15(2)(c)(v) and Article 2(d)(ii)</td>
<td>The stakeholder proposes that ENTSO-E should choose what is Pref in case of ESMs, the same concerns 2(d)(i). It is argued that these values should not be left to the discretion of the relevant system operators.</td>
</tr>
<tr>
<td>NC DC</td>
<td>EU DSO</td>
<td>Article XX(3)</td>
<td>The stakeholder suggests that frequency and voltage ranges for the V1G requirements should not be more constraining than the VDG ones. XX.3 should be noted that LFSM-U requirements risk to apply additional costs to EV and will create undue barriers to the development of e-mobility. In addition, the drop setting of 5% of the whole European EV fleet for a frequency threshold of 49.8 Hz could lead to grid instability. Consequently, the stakeholder considers that this new requirement needs to be duly justified through a cost-benefit analysis at system level. The stakeholder is not convinced about the net social welfare of these types of services and is in favour of eliminating this part and they remain open to any initiative on this field in order to elaborate more detailed and more consensual measures. XX.4, for the same reasons as above, the stakeholder proposes to delete any reference to LFSM-UC mode for heat-pumps. As regards the ROCofW withstand capability requirements, no clear technical study has been made yet to see if electrolyser are able to withstand the four given criteria. The stakeholder proposes to remove this requirement. The same considerations should apply for frequency and voltage ranges, as some assets are quite new (e.g., electrolyser) and their behaviour inside the grid is not well known and does not benefit a strong return on experience compared to classical generation assets or even batteries.</td>
</tr>
<tr>
<td>NC DC</td>
<td>EDF</td>
<td>Article XX</td>
<td>The stakeholder requests how would the vehicle know, in which country it is located. E.g., for LFSM-UC: Ireland has 49.5 Hz frequency threshold as compared to rest of Europe with 49.8 Hz.</td>
</tr>
<tr>
<td>NC DC</td>
<td>Dr. Ing. h.c. F. Porsche AG</td>
<td>Article XX(3)(c), (5)(c), Table X.1.1</td>
<td>The stakeholder requests how would the vehicle know, in which country it is located. E.g., for LFSM-UC: Ireland has 49.5 Hz frequency threshold as compared to rest of Europe with 49.8 Hz.</td>
</tr>
</tbody>
</table>

ACER agrees with the inclusion of HVRT capability for type EV3 to increase the robustness during high voltage events. Relevant amendments have been introduced in the NC RIG.

ACER agrees with the proposed amendment. Relevant amendments have been introduced in the NC RIG.

The provision for LFSM-UC will already be activated for these devices prior to load shedding. ACER does not consider that the proposed wording on disconnection of EVs is adequately justified.

ACER considers full harmonisation of all pertaining requirements for both the EVs and the EV supply equipment important for these mass market products. Furthermore, it is important that capacities of electric vehicles and associated electric vehicle supply equipment connected to an electrical charging park should not be aggregated for the purpose of the determination of their significance. However, certain additional requirements apply to the electrical charging park, such as the information exchange.

ACER considers important to properly define and include the electricity storage modules, as well as, defining their associated capabilities in the legal text to aid clarity.

ACER agrees with the proposed amendment. Relevant amendments have been introduced in the NC RIG.

ACER agrees with the proposed amendment. Relevant amendments have been introduced in the NC RIG.

ACER considers important to properly define and include the electricity storage modules, as well as, defining their associated capabilities in the legal text to aid clarity.

ACER agrees with the proposed amendment. Relevant amendments have been introduced in the NC RIG.

ACER agrees with the proposed amendment. Relevant amendments have been introduced in the NC RIG.

ACER has aligned the frequency and voltage ranges for the V1G and V2G EVs/EVSEs.

The drop at 5% was discussed during the dedicated ACER workshop and system operators seem to agree with this value.

These capabilities are not deemed as services but system needs contributing to the system stability shortly after the occurrence of a system disturbance.

Electrolysers, which are planned to reach a significant network penetration in the near future, are employing similar converters as for example PPMs thus having similar technical capabilities. In discussions with the manufacturers, no issues with compliance have been identified.

In the particular case of Ireland, the capabilities may, to a certain extent, be different. This is due to the presumably low number of EVs originating from Ireland (right-hand-side driving) that will cross the Member States borders. EMC is out of the scope of the NC DC.
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<tr>
<td>NC RfG</td>
<td>VGBE</td>
<td>Article 30a</td>
<td>The stakeholder proposes to add a provision regarding operational notification for EV1.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>CENELEC</td>
<td>Article 13a(2)</td>
<td>The stakeholder proposes to add provisions that a V2G electric vehicle supply equipment shall be capable of smart recharging.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>CENELEC</td>
<td>Article 13a(6)(d)</td>
<td>The stakeholder proposes Article 13(3)(e) be consistent regarding the response time for LFSM-O-EV. Article 13 does not allow any delay in the action of LFSMO for other PPM.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Avere-France and ATEE, Renault</td>
<td>Article 13a(6)(f)</td>
<td>The stakeholders suggest adding the same requirement on switching: “Switching from consumption to generation and vice versa should be as fast as technically feasible”.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Avere-France and ATEE, Renault</td>
<td>Article 14a(5)(d)</td>
<td>The stakeholders suggest that the information exchange should be applied on the electrical cabinet and should not impact individual electric vehicle supply equipment of EV charging park.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>EDF</td>
<td>Article 14a(1), Article 14a(6)</td>
<td>The stakeholder considers that the proposed title of Article 14a refers to V2G electrical charging parks in addition to EV1 electric vehicles and associated V2G electric vehicle supply equipment. The stakeholder suggests that it should be clear that Article 14a requirements apply to the electric vehicles and associated V2G EVSE which have been defined as EV3 based on their individual capacity and not on the aggregated capacity of the electrical charging park. For this reason, and because the stakeholder does not see any drawback to it, it suggests removing the reference to electrical charging parks in Article 14a title.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Finnish Energy</td>
<td>Article 30a</td>
<td>The stakeholder argues that in Finland they do not allow household plug connections of generation. Also, all production equipment must be approved to be connected by the DSO. The process is straightforward if everything is in order and EN 50549-1 is used.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Avere-France and ATEE, Renault, EDF</td>
<td>Article 30a(3)</td>
<td>The relevant system operator, on acceptance of a complete and adequate SED, shall issue a final operational notification, as soon as possible, to the electrical charging park owner.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC DC</td>
<td>Avere-France and ATEE, Renault</td>
<td>Article XX(1)(b)</td>
<td>As for the V2G requirements, the stakeholder considers that the frequency and voltage ranges should be harmonised for V1G on the European level and should not be dependent on the national regulations. Moreover, the V1G requirements should not be more restricted than the V2G ones. For these reasons, they propose to copy paste here the relative paragraphs of the Article 13a from the NC RfG.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC DC</td>
<td>Avere-France and ATEE, Renault</td>
<td>Article XX(3)</td>
<td>As regards LFSM–UC on V1G electric vehicles and associated V1G electric vehicle supply equipment, the stakeholders argue that the V1G electric vehicle supply equipment are not capable to measure the frequency and adapt their consumption. Such requirements risk creating additional costs to EVSE and could create barriers to the development to e-mobility. Moreover, they are not convinced about the net social welfare of these types of services. Therefore, they suggest eliminating this part and they remain open to any initiative on this field in order to elaborate more detailed and more consensual measures.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>National Grid ESO</td>
<td>Article 14(5)(b)</td>
<td>The stakeholder notes that Article 14(5)(b) relates to protection schemes and settings for EVs. It looks like the list of protection functions has been copied from a synchronous generator, which would not be applicable for an EV. For example</td>
<td>Agree</td>
</tr>
</tbody>
</table>

Legend: Disagree, Agree, Partly agree, Partly disagree, ACER agrees that national connection requirements are applicable for the connection procedure e.g., to determine conditions for the connection of V2G assets. No further amendments have been introduced in the NC RfG.
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<td>NC RfG</td>
<td>National Grid ESO</td>
<td>Article 13(11)</td>
<td>The stakeholder points out that there are now requirements for Electricity Storage Modules to automatically drop their consumption level as system frequency starts to fall. Some consideration should be given as to whether Article 15(3) of the EU Emergency and Restoration Code is relevant now this requirement has been introduced into RfG 2.0.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Undisclosed respondent</td>
<td>Article 14a(1)</td>
<td>The stakeholder request clarification as to whether Article 14a is still valid for V2G type EV1 and EV2, since the ACER documentation explicitly mentions this.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Undisclosed respondent</td>
<td>Article 14a(2), (6)</td>
<td>The stakeholder suggests that the relevant TSO should specify shorter periods of time and reactive power capability within a defined bandwidth.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>RES Group</td>
<td>Article 5(6)</td>
<td>The stakeholder considers that the original text referred to “the capacity of the power-generating module” but “capacity” is undefined. The stakeholder proposes the following: Also, the new Article 5(6) leaves the significance of V2G &gt;=1MW undefined Article 5(2)(b) “Where the maximum capacity of the power generating module…” Article 5(2)(c) “Where the maximum capacity of the power generating module…”</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>National Grid ESO</td>
<td>General comment</td>
<td>The stakeholder notes that there are new requirements on V2G Electric Vehicles and their related charging Networks. It would be significantly simpler to treat V2G Electric Vehicles and their associated charging Networks as Electricity Storage Modules and then apply the type A, type B, type C and type D Power Generating Module criteria to them rather than duplicating large sections of text. That said, there needs to be consistency between charging arrangements between EVs driving between different Member States.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>SIEMENS AG</td>
<td>Article XX</td>
<td>The stakeholder states that the tolerances for the system voltage are defined by EN 50160 is +/- 10% (Chapter 4.2.2.1), a lot of devices and units are designed and tested under these mandatory requirements. By introducing higher tolerances, such deviation can lead to a lot of effort on redesign and testing and might hinder the market access. The requirements on the variation of the supply frequency and fault right through requirements are not in line with EN 50160 and for example EN 61000-4-11 and EN 61000-4-34. This leads to extra effort in testing and redesign for products which were already tested under well-defined IEC Standards. The stakeholder proposes to define the voltage tolerances according to EN 50160. Change the value Urec 2 from 0.85 % to 0.9%. In Table x.11 Define the requirements on frequency variation and FRT based on the well proven IEC and EN standards like EN 50160 and EN 61000-4-11 and EN 61000-4-34</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>Undisclosed stakeholder</td>
<td>Article XX</td>
<td>The stakeholder suggests that according to Table XX.1.1 and Table XX.1.2; values Uclear and Urec1; trcl1 and trec2 values should be aligned with Figure XX. C, to represent the graph.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>Undisclosed stakeholder</td>
<td>Article XX-2, Article 35</td>
<td>The stakeholder considers that when simulation models are becoming an obligation for V1G, a harmonised standard is needed, which is covering the Level of details of a model, e.g. generic approach; SW format. Also, the stakeholder claims that harmonised standards are required, as a basis for CE declaration, which will certify compliance.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC DC</td>
<td>Terna Spa</td>
<td>Article XX</td>
<td>As regards paragraph 3(b): The stakeholder recommends defining a range for the LFSA-UC droop in order to have an adjustable parameter with a default value (in line with the NC RfG approach).</td>
<td>Disagree</td>
</tr>
</tbody>
</table>

The accuracy for frequency measurements as currently set at ± 30ms was proposed by ENTSO-E during 2022 public consultation.

Disagree: These requirements may require a site-specific consideration and ad-hoc bandwidths are not appropriate.

Agree: Article 14a(1) stipulates requirements for type EV3 electric vehicles and associated V2G electric vehicle supply equipment and type EV3 associated V2G electrical charging parks only. The reference to type EV1 and EV2 V2G electric vehicles and associated V2G electric vehicle supply equipment has been removed.

Partly agree: The accuracy for frequency measurements as currently set at ± 30ms was proposed by ENTSO-E during 2022 public consultation.

The maximum capacity of the power-generating module is the parameter used in the existing NC RfG and is defined in Article (2). Nevertheless, the criteria in Article 5(6) to determine the significance of the V2G EVs and associated EVSEs have been amended along with Chapin proposal.

Requirements for V2G EVs and associated EVSEs need to be harmonised and exhaustively defined so as to allow for the cross-border mobility, but type A, type B, type C and type D Power Generating Module criteria are not fit for this purpose. Also, charging arrangements are out of scope of the connection codes.
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<tr>
<td>NC RIG</td>
<td>Terna Spa</td>
<td>Article 13a(3), (5), (6), (9)</td>
<td>As regards Article 13a(3), concerning autonomous reconection of EVi and EV2, the stakeholder recommends to maintain harmonised requirements with PGM (Article 13.8) regarding adjustable reconection conditions and default values. As regards Article 13a(5), the stakeholder recommends defining a range for the LFSDM-U-EV droop in order to have an adjustable parameter with a default value, in line with the NC RIG approach. As regards Article 13a(6), the stakeholder recommends defining a range for the LFSDM-O-EV droop in order to have an adjustable parameter with a default value, in line with the NC RIG approach. As regards Article 13a(9), the stakeholder fully supports the inclusion of mandatory FRT requirements for EVs. It is also understandable ACER’s reasoning for proposing FRT requirements as exhaustive. However, the exhaustive nature of the requirement makes it necessary to define appropriate voltage and time parameters. The stakeholder recommends setting the Uref for EV1, same as for PPM type A, to 0.05 p.u and not 0.15 p.u., in order to avoid trip of large scale of EVs for transmission faults. They propose Table X.1.1 - Uref to be 0.05 p.u. The stakeholder proposes (g) Requirements for frequency measurement: (i) Maximum measuring time window: 100 ms (ii) Accuracy: ±10 mHz; Table X.1.1 - Uref to be 0.05 p.u. 7. A VIG electric vehicle supply equipment shall be equipped with a cyber-protected data exchange interface in order to modulate, without undue delay, active power input following an instruction being received at the input port. The relevant system operator shall have the right to specify requirements for equipment to make this facility operable remotely.</td>
<td>See reply to ENTSO-E above See reply to ENTSO-E above</td>
</tr>
<tr>
<td>NC DC</td>
<td>E.ON</td>
<td>Recital (15)</td>
<td>The stakeholder considers that the DSO’s UFLA concepts must remain untouched and proposes adding the sentence “For distribution grids, LFDD is retained as an emergency measure in the event of frequency decline.”</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>VDE FNN</td>
<td>Recital (15)</td>
<td>The stakeholder proposes a scheme different from the LFSDM-UC later in the text. LFSDM-UC/FDD-D-UC requirements must be fulfilled by VIG electric vehicle and the associated VIG electric vehicle supply equipment. An AC electric vehicle supply equipment alone is able to adjust the charging current according to IEC 61851-1:2017 but the power electronics in the electric vehicle has to react upon this signal. The DSO’s LFDD concepts shall remain untouched.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>EDP, E-REDES, Eurelectric</td>
<td>Recital (15)</td>
<td>The stakeholders propose to add the sentence “Also, in big car parks, the impact of the V2G charging station on the frequency, namely super-harmonic, should be considered” at the end of the recital.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>Finnish Energy</td>
<td>Recital (15)</td>
<td>The stakeholder generally agrees with the proposal, however stresses that care should be taken to make sure that the frequency sensitive mode is reliable.</td>
<td>Disagree</td>
</tr>
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</table>

ACER considers that a requirement for VIG electric vehicle supply equipment to be equipped with a cyber-protected data exchange interface in order to modulate, without undue delay, active power input following an instruction being received at the input port, is disproportionate and unnecessary due to introduction of the LFSDM-UC capability which will reduce the consumption of VIG EVs during an underfrequency event.
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<tr>
<td>NC DC</td>
<td>Undisclosed respondent</td>
<td>Article 1</td>
<td>The stakeholder proposes to introduce connection requirements on thermal appliances gradually. Furthermore, mass deployment of heat pumps must not be hindered in order to achieve the European decarbonization target. Heat pumps should not be disadvantaged by additional requirements over less efficient appliances that can provide similar functionality. The target application should be heat pumps as well as other appliances that can provide similar services such as electrical equipment, electric boilers, and electric water heaters.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>Undisclosed respondent</td>
<td>Article 2, XX</td>
<td>The stakeholder proposes that the definition of heat pumps should be changed to limit the application to only heat pumps with thermal storage. The proposed definition is too wide and due to the variety of HP types (air based, water based, monobloc, split/multi-split, gas powered, electricity powered, hybrid), application (residential, commercial, process), will impose requirements on many systems that cannot serve the purpose of NC DC. In thermal appliance such as heat pumps, it is necessary to consider the comfort and thermal health risk to the user. During a smart appliances study, it has been recognised that when considering flexibility two categories of thermal appliances should be distinguished. These are appliances with thermal storage capabilities (such as thermal inertia and water tank) and appliances without thermal storage (such as air to air and electric radiator). Thermal appliances with thermal inertia should be the first target for flexibility requirements as they provide the most flexibility potential while not jeopardising user comfort.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>Undisclosed respondent</td>
<td>Article 3, XX</td>
<td>The stakeholder argues that it could be possible to reduce the set temperature of a residential heat pump, but it could be problematic for a heat pump used to heat/cool a process in industry. Furthermore, it should be noted that fixed speed (non-INV) air conditioners should not be included because changing the temperature setting does not directly reduce power consumption. In the same way, GHPs with a different driving force should not be included.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>Undisclosed respondent</td>
<td>Article 3</td>
<td>The stakeholder argues that for the improvement of the power system stability to be achieved in the regulation, it should be implemented by power system operators and that is not a function that directly benefits equipment manufacturers and consumers. This additional cost should not be reflected in the product price because the cost should not cause hindrance to the purchase of heating and cooling by consumers. They would like to confirm whether it is correct to understand that the development and implementation costs required for the requirements in the regulation are covered by the authorities as a network tax and do not need to be passed on to the equipment costs purchased by consumers.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>Undisclosed respondent</td>
<td>Article XX(4)(g)</td>
<td>The stakeholder requests the clarification of the meaning of random. For the purpose of avoiding the simultaneous return of all devices, it is not necessary for the same device to randomly change the delay time for each event occurrence, and it would be sufficient if each model had different delay values.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>Undisclosed respondent</td>
<td>Article XX(4)(h)</td>
<td>The stakeholder proposes to reduce the accuracy of the frequency change detection from 0,01 to 0,1 Hz.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>European Heating Industry (EHI)</td>
<td>Article 3</td>
<td>The stakeholder argues that it is not clear whether setting requirements for heat pumps falls within the scope of the Regulation on the Internal Market for Electricity (EU 2019/943). Specifically, Article 59 paragraph 2(a) of Regulation (EU) makes reference to a non-exhaustive list i.e. “(a) network connection rules including rules...”</td>
<td>Disagree</td>
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<td>NC DC</td>
<td>European Heating Industry (EHI)</td>
<td>Public consultation</td>
<td>The stakeholder argues that they have not been directly involved in network codes amendment process. Also, the stakeholder asks for clarification on the origin and the intention of the proposed requirements for heat pumps and also asks ACER to work closely together with the heat pump sector to improve them.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC DC</td>
<td>European Heating Industry (EHI)</td>
<td>Ecodesign Directive</td>
<td>The stakeholder proposes ACER to coordinate with the European Commission to assess whether the Ecodesign framework would be the better location for such connection requirements.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC DC</td>
<td>European Heating Industry (EHI)</td>
<td>Technical feasibility</td>
<td>The stakeholder argues that from a technical standpoint, requirements linked to e.g., frequency or voltages changes will have an impact at product level in terms of i.e., design, engineering, sourcing of components, manufacturing, among others. As an example, the suggested obligations for heat pumps to reach their target temperature within 300 milliseconds, monitor the frequency of the electricity grid, and shut off autonomously if needed, are not taking into account what a heat pump is actually technically capable of and designed to do. The stakeholder also argues that the significance criteria (capacity greater than 0.8 kW at any voltage level), is not grounded in any specific technical analyses of heat pumps, nor of the market for heat pumps.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>European Heating Industry (EHI)</td>
<td>Interaction with similar national initiatives</td>
<td>The stakeholder argues that it is currently unclear how the revised NC DC will interact with similar national initiatives. The stakeholder is of the opinion that provisions in view of the NC DC cover cross-border issues, such as potential blackouts, and should therefore be applicable EU-wide. As such, to avoid double-regulation and ensure free movement of goods, the interaction between European initiatives and similar national legislations (e.g., as discussed by Forum Netztechnik in Germany) currently in the pipeline should be carefully assessed and synchronised.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>EDP</td>
<td>Article 2(73)</td>
<td>The stakeholder asks for the reason the V1G electrical charging park definition says “where three or more V1G” and not “one or more” as in the V1G electrical charging park definition.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>EDP, Eurelectric, Enel Group</td>
<td>Article 2(75)</td>
<td>The stakeholder suggests adding “or operating” to the definition of electrical charging park owner, arguing that in many cases the entity that legally owns the installation does not have the expertise to operate it, to which purpose an operator is responsible for securing all technical requirements regarding the electrical installation.</td>
<td>Disagree</td>
</tr>
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</table>

Thus, under such provision, the Commission is empowered to adopt network codes including network connection rules for other system users as well. The above position is also adopted by the Commission.

Following the publication of the ACER Policy Paper on the revision of the Network Code on Requirements for Grid Connection of Generators (NC RfG) and the Network Code on Demand Connection (NC DC), where heat pumps were mentioned, ACER consulted all stakeholders on their proposal for the amendments of the NC RfG and NC DC. During such consultation ENTSO-E proposed to include requirements for temperature-controlled devices larger than 800W at all voltage levels. In turn, ACER publicly consulted on 17 April 2023 the preliminary draft proposals including requirements on heat pumps in a dedicated workshop.

During severe frequency events, especially in over-frequency case, the trip of large-scale demand units would jeopardise system security. Therefore, relevant voltage and frequency related requirements have been added in ACER draft amendment proposal of the NC DC. These technical capabilities should have no noticeable or negligible effect on the primary use of these devices. Where their performance and comfort for the user should be defined within the European Standards in accordance with the principle defined in the NC DC.

NC DC, as applied for any other device falling within its scope. Nevertheless, the Commission may choose a different legal vehicle to this end.

Regarding the total reaction time for LFSM-UC’s sensitivity (set as no higher than 300ms), refers to the electrical control system and not the temperature.

As to the significance criteria, said capacity was introduced on the basis of ENTSO-E’s proposal to ensure equitable treatment of system users (it should be noted that the same capacity is used for generators, electricity storage modules, EVs and power-to-gas demand units).

The proposed amendments to the NC DC allow for harmonisation of requirements which will, in contrast to national approaches, allow for a level playing field and ensure geographically even system response during frequency excursions. This latter is essential to the preserve system stability during large scale system disturbances.

Nevertheless, in our understanding, any additional requirements which are not in contradiction with the harmonised requirements of the NC DC are still possible at national level, e.g., applied via the agreed European standards.

The definition of V1G electrical charging park has been removed.

As the definition only covers ownership, ACER considers that adding “owning or operating” to the definition is irrelevant. Moreover, the legal obligation for an installation to comply with the NC RfG is laid on the owner and not the operator.
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<td>NC RIG</td>
<td>EDP, Eurelectric</td>
<td>Article 13a(5)</td>
<td>As regards to point (f), the stakeholder proposes to acknowledge that switching must be done while “safeguarding the integrity and conservation of associated components” (EV battery and EVSE).</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>EDP, Eurelectric, Enel Group</td>
<td>Article 30(2), Article 30b(2)(f)</td>
<td>The stakeholders propose to delete the requirement in point (f) as it is excessive considering that the EV3 type begins at 40kW, which can be a barrier.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>EDF</td>
<td>Article 30a (new)</td>
<td>The stakeholder insists on the importance of a simple and fast process. The relevant system operators shall provide the installation document template online and allow the digitally filled in documents to be easily posted on its website.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>EDP, Eurelectric, Enel Group</td>
<td>Article 30b(1)</td>
<td>The stakeholder proposes that a supply equipment document shall be provided either by the electrical charging park owner or by the employer. That is due to the fact that the owners usually do not have the expertise to operate the installation, to which purpose an operator is responsible for securing all technical requirements.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>CharIN, BDEW, Verband der Automobilindustrie, undisclosed stakeholder</td>
<td>Article 2(67)</td>
<td>The stakeholders request, in order to be made clear that V2G EVs and EVSE do not have to fulfill all requirements for ESMs, adding a clarification that separate requirements and connection procedures apply if maximum capacity is less than 1 MW (type EV3).</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>CharIN, Verband der Automobilindustrie, VDE FNN, BDEW</td>
<td>Article 2(69), (70) and (72)</td>
<td>The stakeholders suggest the following to be added to the definitions to clarify that - an V1G electric vehicle always requires an associated V1G electric vehicle supply equipment. - an V2G electric vehicle always requires an associated V2G electric vehicle supply equipment. No distinction is made between AC and DC V2G, which means that cars and charging points are often mixed up. It would be helpful if the two variants were described once, and if it was clearly stated that both are meant. - no distinction is made between AC and DC V2G, which means that cars and charging points are often mixed up. It would be helpful if the two variants were described once, and if it was clearly stated that both are meant.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Verband der Automobilindustrie, Mercedes Benz</td>
<td>Article 2(73)</td>
<td>The stakeholders suggest, as this definition is not further used neither in NC RIG nor in NC DC, to be deleted. According to the regulation, a multi-family house with three charging points would already be a charging park. However, in such cases, there would not be one single power park operator. In general, it should be avoided to impose additional bureaucratic hurdles on private individuals for the use of EVs.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>CharIN, Verband der Automobilindustrie</td>
<td>Article 5(6)</td>
<td>Stakeholders propose to clarify the significance criteria to ensure that it concerns the maximum feed in capacity. Also, alignment with CharIN BIDI Power Classes is proposed, type EV2 shall be at 50 kW (not 42 kW).</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Eurelectric, Enel Group</td>
<td>Article 5(6)</td>
<td>The stakeholders propose to move the minimum level for EV3 to a higher value, at least 100 kW, to ensure that EV3 are connected at MV level.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>CharIN, Verband der Automobilindustrie</td>
<td>Article 5(6)</td>
<td>The stakeholders ask ACER to clarify the following questions: What if the EVSE has two charging points, both are capable of 40kW active power output to the grid. What is the maximum capacity? 40kW or 80kW? How is “maximum capacity” defined? They suggest that the logic must be that the EVSE maximum active power output capacity is relevant here. EVs change if...</td>
<td>Disagree</td>
</tr>
</tbody>
</table>
The stakeholders suggest that it shall be open how the V2G electric vehicles and associated V2G electric vehicle supply equipment proof that the total system of EV and EVSE complies with the requirements of this regulation. Certification should be possible for different technical solutions. The target would be to have the V2G electric vehicle part as part of the homologation. An interim solution until it is included in homologation is necessary.

The requirements set in this regulation are not covered by the relevant product standards for V2G electric vehicles (ISO 17409/ISO 5474-series) and associated V2G electric vehicle supply equipment (IEC 61851-1/2-3) and therefore are not taken into consideration in V2G electric vehicle homologation/certification and the conformity assessment of the V2G electric vehicle supply equipment. They propose a workshop with European system operators to discuss how this can be done.

Technology openness shall be ensured. European-wide solutions must be ensured.

One stakeholder states that the conformity declaration to be completed either by the EV manufacturer or their designated agents to perform analysis, tests and inspection of the EV or EVSE as a proof of compliance within the national NC RfG implementation.

The stakeholder asks whether EV1 and EV2 with reference to Article 13a, the stakeholders propose that a distinction between AC charging (AC vehicle to grid) and DC charging (DC vehicle to grid) to be added. In any case, the EV supply equipment shall be the master of the charging / generation operation.

As regards the rules for EV1 and EV2 with reference to Article 13a, the stakeholders propose that a distinction between AC charging (AC vehicle to grid) and DC charging (DC vehicle to grid) to be added. In any case, the EV supply equipment shall be the master of the charging / generation operation.

In the case of AC power generation by the EV, the vehicle can implement requirements through the on-board charger itself. In the case of DC power provisioning by the EV, the off-board charger external to the vehicle is the implementing instance (as EV supply equipment). Therefore, a pure power definition is not sufficient to assign functions in the charging system.

The stakeholder asks whether V2G EV & EVSE must fulfill the NC RfG in respect of consumption. This should be part of NC DC. Also, it is suggested to move Title II Article 13a 6a to NC DC.

The stakeholder asks why ESMs should comply with the NC RfG when they are in charging mode; the stakeholder considers that in charging mode they should comply to NC DC and proposes to provide that the relevant requirements of the NC RfG shall be satisfied when the electricity storage module or V2G electric vehicle and associated V2G electric vehicle supply equipment injects active power to the network.

The stakeholder proposes the activation be subject to customers consent and CPO consent.

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<td>NC RfG</td>
<td>Charter, Verband der Automobilindustrie, undisclosed stakeholder</td>
<td>Article 5(6)</td>
<td>The stakeholders suggest that it shall be open how the V2G electric vehicles and associated V2G electric vehicle supply equipment proof that the total system of EV and EVSE complies with the requirements of this regulation. Certification should be possible for different technical solutions. The target would be to have the V2G electric vehicle part as part of the homologation. An interim solution until it is included in homologation is necessary.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>EREDRES</td>
<td>Article 5(6)</td>
<td>The stakeholder argues that there is no difference between the types of V2G electric vehicles and electric vehicle supply equipment in points (a) and (b). They propose to merge these two categories.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>EFAC</td>
<td>Article 5(6)</td>
<td>The stakeholder argues that introduction of technical requirements as well as of provisions on compliance of V2G types is inconsistent with the type definition of PGMs in Article 5(2) - (5).</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Verband der Automobilindustrie, Mercedez Benz</td>
<td>Article 5(6)</td>
<td>As regards the rules for EV1 and EV2 with reference to Article 13a, the stakeholders propose that a distinction between AC charging (AC vehicle to grid) and DC charging (DC vehicle to grid) to be added. In any case, the EV supply equipment shall be the master of the charging / generation operation.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>CharterN</td>
<td>Article 6(6)</td>
<td>The stakeholder asks whether V2G EV &amp; EVSE must fulfill the NC RfG in respect of consumption. This should be part of NC DC. Also, it is suggested to move Title II Article 13a 6a to NC DC.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Energie-Nederland</td>
<td>Article 6(6)</td>
<td>The stakeholder asks why ESMs should comply with the NC RfG when they are in charging mode; the stakeholder considers that in charging mode they should comply to NC DC and proposes to provide that the relevant requirements of the NC RfG shall be satisfied when the electricity storage module or V2G electric vehicle and associated V2G electric vehicle supply equipment injects active power to the network.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Undisclosed stakeholder</td>
<td>Article 6(6)</td>
<td>The stakeholder proposes the activation be subject to customers consent and CPO consent.</td>
<td>Disagree</td>
</tr>
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<td>NC RIG</td>
<td>CharIN, Verband der Automobilindustrie</td>
<td>Article 13a(5)(c), Article 13a(6)(b)</td>
<td>The stakeholders argue that Article 13a(5) is not a threshold value but a delta frequency.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Verband der Automobilindustrie, Mercedes Benz</td>
<td>Article 13a(5)</td>
<td>The stakeholders argue that the customer will not provide grid support services for free, and question how this grid support function is monetised? Making this function a rule, business models will not be possible anymore. The main purpose of an electric vehicle is driving – not power generation. Electric vehicles are no power plants. The “vehicle to grid” function might just cover a low percentage rate of the vehicle operating time. In this requirement, 100 % availability is assumed. The charging strategy of the customer is not considered. Reaction times of 500ms are not realistic, because digital communication between the EVSE (“Master of the grid code”) and the vehicle is needed in order to negotiate the operating point. The stakeholders ask what happens if the specified reaction for limited frequency sensitive mode – underfrequency (LFSM-U-EV) according to the grid code differs from the operational limits communicated by the EVSE. (e.g., current limit below vs. P_max requirement), and which device clarifies the conflict.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>CharIN, Verband der Automobilindustrie, Eurelectric, Mercedes Benz, undisclosed participant, BDEW</td>
<td>Article 13a(6)(a)</td>
<td>The stakeholders argue that this provision should be deleted because consumption should not be considered in NC RIG. In general, the forced charging of the vehicle is rejected, because this will have negative effect on the lifetime of the electrical components in the EV and EVSE. Different limits of mains, EVSE and vehicle are realistic. The stakeholders pose the following questions: What happens if the specified reaction according to grid code differs from the EVSE? Which device is master? Do only V2G electric vehicles and associated V2G electric vehicle supply equipment have to fulfil these requirements? What about V1G electric vehicles and associated electric vehicle supply equipment. The stakeholders propose to shift these requirements to NC DC. The stakeholders propose that the phrase “to the extent that is technically feasible” should also include that the EV, not the grid or the charging station, determines the power consumption of the EV. It should be made clear that the level to increase active power should be related to the state of the battery and taking into account the battery health.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Undisclosed participant</td>
<td>Article 13a(7)</td>
<td>The stakeholder asks for the definition of ‘constant output’ and in particular acceptable fluctuation limits.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>CharIN, Verband der Automobilindustrie</td>
<td>Article 14a: article’s title</td>
<td>The stakeholders propose a clarification to ensure that Article 14a is not relevant for type EV1 and EV2 electric vehicles and associated V2G electric vehicle supply equipment, even if they are within an V2G electrical charging park.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Fingrid Oyj</td>
<td>Article 14a(5)(b)(iii)</td>
<td>The stakeholder suggests adding change in angle (vector shift) to the list.</td>
<td>Agree</td>
</tr>
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<tr>
<td>NC RfG</td>
<td>CharIN, Verband der Automobilindustrie</td>
<td>Article 14a(5)(d)(iii)</td>
<td>The stakeholders propose that the usage of sub-metering or dedicated metering devices (DMD) as described in the Network Code on Demand Response should be allowed.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>Verband der Automobilindustrie</td>
<td>General comment</td>
<td>Reactive power provision while providing dynamic grid support requires energy flow into the grid. Therefore, the stakeholder proposes that the demand unit must have an internal storage (e.g., for heat-pumps) or the hardware must be bidirectional (e.g., V1G electric vehicle supply equipment).</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>CharIN, Verband der Automobilindustrie</td>
<td>Recital (15)</td>
<td>The stakeholders propose to clarify that the LFSM UC requirements have to be fulfilled by V1G electric vehicle and the associated V1G electric vehicle supply equipment. An AC electric vehicle supply equipment alone is able to adjust the charging current according to IEC 61851-1:2017 but the power electronics in the electric vehicle has to react upon this signal.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC DC</td>
<td>CharIN, Verband der Automobilindustrie, Mercdeez Benz, Iberdrola, BDEW e.V</td>
<td>Article 2</td>
<td>The stakeholders argue that the definition of V1G electric vehicle supply equipment is missing in NC DC, it is only available in the NC RfG. To avoid misunderstandings and to clarify the scope, a definition is necessary. Definition of “electricity storage” is missing.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC, NC RfG</td>
<td>CharIN, Verband der Automobilindustrie, Mercdeez Benz, Iberdrola, BDEW e.V</td>
<td>Article 3(1) (NC DC) Article 14a(1) (RfG)</td>
<td>The stakeholders argue that the definition of “new” is unclear. The requirements set in this article for demand unit “V1G electric vehicle and associated V1G electric vehicle supply equipment” (operating behaviour for frequency (Annex I) and voltage (Annex II), ROCOF withstand capability, LFSM UC, fault-rider-through capability) are not covered by the relevant product standards for V1G electric vehicles (ISO 17490/ISO 5474-series) and associated V1G electric vehicle supply equipment (IEC 61851-1:23) and therefore are not taken into consideration in V1G electric vehicle homologation/certification and the conformity assessment of the V1G electric vehicle supply equipment. The stakeholders consider that there must be a long enough transition period to guarantee the revision of these standards. The system operator is not able to distinguish between new vehicles, that have to comply with this regulation and old vehicles. Also, the system operator cannot monitor which V1G EV connects for charging. Thus, this requirement should apply to the vehicle supply equipment at most. The phrase “a new V1G electric vehicle should be deleted”. The stakeholder considers that since electric vehicles are a new player in the NC RfG, it is necessary to require a time extension to study the implications in a proper way.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC DC</td>
<td>Verband der Automobilindustrie, Mercdeez Benz, Undisclosed stakeholder</td>
<td>Article 24(3)(a,b)</td>
<td>The stakeholders propose to 1): delete “V1G electric vehicle supply equipment” and 2) clarify that the obligations mentioned here only concern commercial charging infrastructure. Private charging infrastructure is to be excluded.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>CharIN, Verband der Automobilindustrie, Mercdeez Benz, BDEW e.V</td>
<td>Article 25(3)</td>
<td>The stakeholders pose the following questions: 1) As regards AC charging: How are simulation models possible for V1G EVs, which move from connection point to connection point? How to handle different V1G EVs charging at a charging point or installation? 2) As regards DC charging: Inverter in EVSE, so simulation can be easily done with EVSE only. They consider that vehicles must be regarded here as mobile equipment. In contrast to stationary equipment (such as heat-pumps), compliance and technical data cannot be provided here. In principle, all vehicles must be allowed to charge at all charging points (grid connection points). The stakeholders consider that it is</td>
<td>Disagree</td>
</tr>
<tr>
<td>Applicable NC</td>
<td>Respondents</td>
<td>Section of proposed amendment</td>
<td>Summary of respondents' response</td>
<td>ACER views</td>
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<tr>
<td>NC DC, NC RfG</td>
<td>Verband der Automobilindustrie, Mercedez Benz, undisclosed stakeholder</td>
<td>Articles XX(2)(a) and XX (5)(a) (NC DC) Article 2(42) (NC RfG)</td>
<td>The stakeholders argue that 'staying connected' is not defined and question its meaning: the vehicle remains connected to the grid with active communication and the charging components no longer need to be active? More detailed information needed.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC DC</td>
<td>CharIN, Verband der Automobilindustrie</td>
<td>Article XX(3)</td>
<td>The stakeholders suggest defining and use Pref throughout the article.</td>
<td>Agree</td>
</tr>
</tbody>
</table>
| NC DC | BOEW e.V | Article XX(5)(a) and (c) | As regards (a), the stakeholder suggests adding text in order to clarify what is meant by "connection point" as follows: The V1G electric vehicle and associated V1G electric vehicle supply equipment, when operating above the minimum stable operating level, shall be capable of staying connected to the network and continuing to operate stably after the power system has been disturbed by faults in the transmission network according to a voltage-against-time-profile in line with Figure XXc at the connection point of the V1G electric vehicle or associated V1G electric vehicle supply equipment and with the set points in Tables X.1.1 and X.1.2: 

Understood to recover the same load as before but EV might not want to recover pre-fault active power consumption due to:
- Battery almost full
- Time-of-use tariff entering an expensive time
- HEMS is lowering charging current due to local overload
- Not enough solar power for charging available anymore
1s recovery time from "not charging" to "charging" is too short. EVSE-EV communication setup is taking much longer. A steep ramp-up curve could lead to flicker (EMC).
Also, the stakeholder proposes to change from "shall" to "should" in order to not put this requirement mandatory. Extend recovery time to 60s. | Partly agree |
| NC DC | Verband der Automobilindustrie, Mercedez Benz | Article XX(3)(a) | The stakeholders propose the following requirement to be added: V1G electric vehicle supply equipment has the responsibility of ensuring that the V1G vehicle behaves compliant to the requirements of this regulation. Supply equipment shall be the master of the charging process, because according to current concepts and standards, the limits of the infrastructure and the communication with the system operator is located there. The electric vehicle and its on-board charging equipment are the last members in the "control chain". The stakeholders consider that regarding the DCC draft, the V1G shall remain the master. Furthermore, electric vehicles are not assigned to a certain demand facility. Every electric vehicle shall be allowed to charge with every supply equipment in every demand facility. Procedures and certificates which are based on a fixed assignment have to be avoided. | Disagree |
| NC DC | Mercedez Benz | Article XX(3)(f), (g) | The stakeholder proposes to add requirement in (f): | Disagree |

Relevant amendments have been introduced clarifying that the devices in question need to remain connected to the network and continuing to operate stably. This wording is used in other instances concerning the PGMs.

Relevant changes have been introduced in the NC DC.

Provision of paragraph (a) has been amended for clarity.

Conditions proposed to be considered during the recovering of the active power consumption after the clearing of the network fault fall out of scope of this capability aiming at ensuring the stability of the network. The proposed conditions may be considered after the fault is cleared and the stable network conditions are attained.

Recovery time has been adjusted to 60s so as to avoid flickers.

The NC RfG remains silent on who is the master of the charging/generation operation. ACER understands, the reaction time is a capability of the converter. Also, the EVSE should not restrict the on-board converters behaviour during large frequency transients. In our view, EVSE should manage the "stationary" operating point and not necessarily the converters behaviour during frequency transients.

The NC RfG remains silent on who is the master of the charging/generation operation. ACER understands that the reaction time is a capability of the converter. Also, the EVSE should not restrict the on-board converters behaviour during large frequency transients. In ACER’s view, EVSE should...
<table>
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<tr>
<td>NC DC</td>
<td>CharIN, Verband der Automobilindustrie</td>
<td>Article XX(2)(d)</td>
<td>The stakeholders suggest updating the reference to Table 2 and that Table 2 cannot be found in the document.</td>
<td>Agree</td>
</tr>
</tbody>
</table>
|               | CharIN, Verband der Automobilindustrie, Mercedes Benz | Article 3, Article XX(3) | The stakeholders argue that, as regards AC charging, it is not clear/possible how to implement it. They propose the following:  
Option 1: Use PWM or ISO15118-2 to send “limit” from EVSE to EV. However, this is only an upper limit and EV can decide to charge less. Also: EV has up to 5s to respond to PWM signal. Then the EV still needs to adjust the power. So, it can be done only in up to 10s.  
Option 2: Use ISO 15118-20 amendment with grid codes and transmit P(f) curve to EV, which can react according to its own frequency measurement. But: Also, V1G EVSE/EV would need to support ISO15118-20. | Disagree |
|               | CharIN, Verband der Automobilindustrie, Mercedes Benz | Figure XX | The stakeholders pose the following questions:  
Does this regulation intentionally imply an obligation for PLC (power line communication) between V1G and V1G supply equipment according to (a modified) ISO 15118? Timings should be adapted to the values IEC 61851.  
Does this regulation intentionally imply an obligation for PLC communication between V1G and V1G supply equipment according to (a modified) ISO 15118? Timings should be adapted to the values IEC 61851.  
The stakeholders point out that compatibility between this regulation and existing charging and product standards has a significant impact on the feasibility.  
The stakeholders suggest that existing charging standards should continue to be used in their basic concepts. The same applies to existing infrastructure. Requirements based exclusively on technical solutions with digital communication between V1G supply equipment and vehicle should be avoided (for AC charging). | Agree |
| NC DC         | Mercedes Benz | Article XX(5)(c) | The stakeholders suggest that “staying connected” should be replaced by “staying ready to operate” and “operate stably” means that it is able to operate at all. | Disagree |

The capability of staying connected to the network and continuing to operate stably implies that the V1G EV and associated EVSE shall not trip following a fault in the transmission network as per defined conditions in voltage.
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<tr>
<td>NC DC</td>
<td>CharIN, Verband der Automobilindustrie, BDEW e.V</td>
<td>Article XX(5)(c)</td>
<td>The stakeholders argue that active power “output” is the wrong word here, and that better would be “consumption”.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC DC</td>
<td>CharIN, Verband der Automobilindustrie, Mercedes Benz, BDEW e.V</td>
<td>Article XX-2 and Article XX+3</td>
<td>The stakeholders suggest that as V1G electric vehicles move around in Europe and have to be compliant with several grid codes, it is beneficial if a central certification (or even better homologation) according to a central European standard like EN 50549:10 is done.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC DC</td>
<td>BDEW e.V</td>
<td>Article XX-2 and Article XX+3</td>
<td>The stakeholders argue that Article 24 Interim operational notification 3c says: “equipment certificates issued by an authorised certifier in respect of transmission-connected demand facilities including any V1G electric vehicle supply equipment, power-to-gas demand units, heat pumps of the facility, transmission-connected distribution facilities and transmission-connected distribution systems, where these are relied upon as part of the evidence of compliance” and no EV is mentioned here. (related to Art. 24 par. 3 lit. c)</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>E.ON</td>
<td>Article XX-3</td>
<td>The stakeholder argues that the leaving water temperature of the heat pump or the gas demand units, heat pumps of the facility, transmission-connected distribution facilities and transmission-connected distribution systems, where these are relied upon as part of the evidence of compliance, and no EV is mentioned here. (related to Art. 24 par. 3 lit. c)</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>CharIN, Verband der Automobilindustrie</td>
<td>Article XX+3</td>
<td>The stakeholder proposes that the relevant system operator, in coordination with the relevant TSO, shall specify the content required for the DUD and make the requirements publicly available.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC DC</td>
<td>Verband der Automobilindustrie, Mercedes Benz</td>
<td>Article 34</td>
<td>The stakeholder suggests that it should be open which part of the system (EV/EVSE) must comply with the requirements - also in consideration of AC and DC V1G.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>BDR Thermea</td>
<td>Article XX(1)</td>
<td>The stakeholder suggests that as the heat pump often contains an electrical backup heater, within the thermodynamic compressor system, it should be considered that the response time of an electrical heater is much faster than the thermodynamic system.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>BDR Thermea</td>
<td>Article XX(4)(b)</td>
<td>The stakeholder requests clarifying the temperature range that is referred to and if it’s the leaving water temperature of the heat pump or the ambient temperature setpoint of a room. Moreover, the stakeholder suggests that the principle of an inverter heat pump is to modulate continuously on a temperature setpoint and not to switch ON/OFF depending on a hysteresis.</td>
<td>Disagree</td>
</tr>
<tr>
<td>Applicable NC</td>
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<td>Summary of respondents’ response</td>
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<tr>
<td>NC DC</td>
<td>BDR Thermea, Undisclosed stakeholder</td>
<td>Article XX(4)(d),(f)</td>
<td>The stakeholders argue that the overload of the network is not directly linked with the target temperature but more with the power consumed by the heat pump. Therefore, the adjustment variable of the LFSM-UC should be Target Temperature OR Target Power.</td>
<td>Agree</td>
</tr>
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</tr>
<tr>
<td>NC DC</td>
<td>BDR Thermea</td>
<td>Article XX(4)(h)</td>
<td>The stakeholders argue that the response time as fast as 300ms is not compatible with heat pumps, and that the response time is rather in the order of several seconds.</td>
<td>Disagree</td>
</tr>
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<tr>
<td>NC RfG</td>
<td>Verband der Automobilindustrie, Mercedez Benz</td>
<td>Where applicable, Article 13a(4)</td>
<td>The stakeholders argue that for the controlled reaction of the EV and the EVSE, four cases can basically be distinguished. Taking into account the communication times and the physical limits of the components involved, the following expert estimates for achievable reaction times result: The reaction time is defined from the moment when the EVSE registers an undesired grid condition until the moment when the charged charging behaviour appears on the grid. 1. EV is connected to the EVSE, but no current is flowing (sleep mode). Achievable reaction time less than 60 seconds for AC &amp; DC BiDi. 2. EV is being charged or discharged and the power shall be changed by approx. ± 30%. Reaction time for AC and DC less than 10 seconds. 3. EV is being charged or discharged and the current flow direction shall be reversed. Achievable reaction time for AC and DC less than 20 seconds. The stakeholders also note that fast and high power changes may lead to flicker so that EMC (electromagnetic compatibility) tests may not be passed. The stakeholder requests why 60s observation time and they suggest that normal frequency ranges can be verified within milliseconds.</td>
<td>Disagree</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>NC RfG</td>
<td>Verband der Automobilindustrie</td>
<td>Where applicable</td>
<td>The stakeholders argue that as regards the achievable reaction times from EV &amp; EVSE, it should be differentiated among different cases. They provide their expert estimate on achievable reaction times. For the controlled reaction of the EV and the EVSE, four cases can basically be distinguished. Taking into account the communication times and the physical limits of the components involved, the following expert estimates for achievable reaction times result: The reaction time is defined from the moment when the EVSE registers an undesired grid condition until the moment when the charged charging behaviour appears on the grid. 1. EV is connected to the EVSE, but no current is flowing (sleep mode). Achievable reaction time less than 60 seconds for AC &amp; DC BiDi. 2. EV is being charged or discharged and the power shall be changed by approx. ± 30%. Reaction time for AC and DC less than 10 seconds. 3. EV is being charged or discharged and the current flow direction shall be reversed. Achievable reaction time for AC and DC less than 20 seconds.</td>
<td>Disagree</td>
</tr>
</tbody>
</table>

The relevant amendments have been introduced in the NC DC.

The response time is not related to the temperature itself but rather to the associated control system.

The NC DC remains silent on who is the master of the charging/generation operation. ACER understands that the reaction time is a capability of the converter. Also, the EVSE should not restrict the on-board converter’s behaviour during large frequency transients. In ACER’s view, EVSE should manage the “stationary” operating point and not necessarily the converters behaviour during frequency transients.

When the sleep mode is activated, there is no expected reaction from the EV connected to the EVSE. For example, this is equivalent to solar power plants (non)operation during the night.

Electromagnetic compatibility is out of scope of the NC DC and in our understanding addressed via the implementation of agreed European standards.

The said observation time aims to ensure that the EV reconnects after the system frequency attained a sufficient stability following a system disturbance.

The NC RfG applies similar requirements on all power-electronics based PGMs which are in the case of type EV1 and EV2 V2G EVs and associated V2G EV supply equipment harmonised to allow for free movement and operation of EVs across the EU.

The NC RfG remains silent on who is the master of the charging/generation operation. ACER understands that the reaction time is a capability of the converter. Also, the EVSE should not restrict the on-board converter’s behaviour during large frequency transients. In ACER’s view, EVSE should manage the “stationary” operating point and not necessarily the converters behaviour during frequency transients.

When the sleep mode is activated, there is no expected reaction from the EV connected to the EVSE. For example, this is equivalent to solar power plants (non)operation during the night.
## 9. SIMULATION MODELS AND COMPLIANCE MONITORING

<table>
<thead>
<tr>
<th>Applicable NC</th>
<th>Respondents</th>
<th>Reference to Article(s) / paragraph(s) corresponding to ACER's draft NC proposed amendments</th>
<th>Summary of respondents' response</th>
<th>ACER position</th>
<th>Reasoning</th>
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<tbody>
<tr>
<td>NC RIG</td>
<td>WindEurope, Enercon</td>
<td>Recital (26) New paragraph after Article 14(3)(a)(vii), new paragraph after Article 16(3)(c), new paragraph after Article X(1)(e)</td>
<td>The stakeholders suggest that the compliance testing must be differentiated as by applicable A/B/C/D type.</td>
<td>Partly agree</td>
<td>ACER considers that appropriate and proportionate compliance testing covers the need to differentiate between different types.</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Doosan Škoda Power a.s</td>
<td>Article 15(5)(c)(iii), Article 15(5)(c)(v), Article 52(2)(a), Article 2 (76) to (78) (new)</td>
<td>One stakeholder proposes to leave the decision to include RMS simulations at national level based on existing practices. Another stakeholder proposes to rely on generic models, if available for the plant technology, in case of TSO request or unavailability of suitable generic models, rely on encrypted detailed RMS models and also to use a simplified Norton equivalent for type C. A couple of stakeholders propose new definitions for 'generic model', 'user-written model' and 'inherent energy storage'. One stakeholder considers that any deficiency should be introduced into the Article 2 Definitions (and not in the text of Article Y). One stakeholder proposes to additionally include the definitions of 'grid frequency', arguing that for any frequency-related relevant TSO shall publish a specific definition of frequency that suits the sub-cycle character of this phenomena, and 'short circuit capacity at the connection point', with important clarification which short circuit current is exactly meant, as there are several possible as by IEC 60909.</td>
<td>Disagree</td>
<td>ACER proposed amendment is in line with the conclusions of the GC ESC Expert Group in &quot;Interaction Studies and Simulation Models for PGM/HVDC&quot;.</td>
</tr>
<tr>
<td>NC RIG</td>
<td>ENTSO-E, CENELEC, AEE, Iberdrola, Enercon</td>
<td>Article 15(5)(c)</td>
<td>One stakeholder proposes to amend the inclusion of the estimate of the minimum and maximum short circuit capacity as it belongs to short circuit study (either carried out from Power Generating Facility Owner or System Operator). Also, it is proposed that simulation models and performance data and recordings shall be treated as confidential by TSO. It is proposed that the relevant system operator shall adopt simulation software which can accept simulation model defined in other simulation software in common use.</td>
<td>Disagree</td>
<td>ACER views according to Article 15(5)(c)(vi) it is for the RSO to include upon its request this information. Furthermore, confidentiality obligations are provided in Article 12. The delivery of simulation models in standards not compliant with TSOs tool, may affect compliance process and safety system analysis. However, ACER considers that it is beneficial for both parties to make an effort to optimise the delivery of simulation models.</td>
</tr>
<tr>
<td>NC RIG</td>
<td>COGEN Europe, EU Turbines</td>
<td>Article 15(5)(c)</td>
<td>The stakeholders propose amendments with regard to the simulation models. These include, that in Article 15(5)(c)(xiv), 2500Hz is much higher than the frequencies typically observed in control system interactions (i.e. up to 200Hz). An upper limit of 1000Hz is sufficient and the text should be amended accordingly to avoid unnecessary processing and effects dominated by passive components. The requirements for EMT models and frequency domain simulations Article 15(5)(iv) and (v) are very extensive, especially for type C. Suggestion is that this shall only be required for type D and that (iv) shall only be provided if requested by the DSO or TSO with justification. If there is not a CIM model standard for these types of models, standard for the performance of the models, then it would be challenging to achieve a level of consistency with the development of the models. Accurate EMT models and plant data can only be provided after equipment FAT commissioning and final control tuning. At this stage the actual dynamic performance instead of simulating it with high uncertainties can be measured.</td>
<td>Disagree</td>
<td>ACER's proposed amendment is in line with the conclusions of the GC ESC Expert Group in &quot;Interaction Studies and Simulation Models for PGM/HVDC&quot;.</td>
</tr>
<tr>
<td>NC RIG</td>
<td>WindEurope, Enercon</td>
<td>New definitions, Article 15(5)(c), Article 35</td>
<td>The stakeholders propose amendments with regard to the simulation models. These include, that in Article 15(5)(c)(xiv), 2500Hz is much higher than the frequencies typically observed in control system interactions (i.e. up to 200Hz). An upper limit of 1000Hz is sufficient and the text should be amended accordingly to avoid unnecessary processing and effects dominated by passive components. The requirements for EMT models and frequency domain simulations Article 15(5)(iv) and (v) are very extensive, especially for type C. Suggestion is that this shall only be required for type D and that (iv) shall only be provided if requested by the DSO or TSO with justification. If there is not a CIM model standard for these types of models, standard for the performance of the models, then it would be challenging to achieve a level of consistency with the development of the models. Accurate EMT models and plant data can only be provided after equipment FAT commissioning and final control tuning. At this stage the actual dynamic performance instead of simulating it with high uncertainties can be measured. One stakeholder proposes to add a sentence in Article 35(3)(d) providing that if generic models are required by the RNO and the accuracy of simulations with these is deemed insufficient, the RNO shall proceed with user-written models, without delaying the connection process.</td>
<td>Disagree</td>
<td>ACER's proposed amendment is in line with the conclusions of the GC ESC Expert Group in &quot;Interaction Studies and Simulation Models for PGM/HVDC&quot;.</td>
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</table>
The stakeholders stated that equipment certificates are issued based on international or European testing standards. Compliance test reports according to IEC or EN standards. The national regulatory authority shall define a grace period for the provision of models, which applies to new generation technologies, in order to enable prototypes to be commissioned and operated under a special Limited Operation Notification.

One stakeholder proposes to add in Article 32(2)(b) that the itemised statement of compliance shall be in a format as specified by the relevant system operator regarding the exhaustive and non-exhaustive requirement from this regulation as specified in the national implementation applied by the relevant system operator.

One stakeholder proposes to include additional point (h), establishing that Member States, competent entities and system operators shall give permission to prototypes with new technologies to be connected to the grid with prototype declarations, and give reasonable time for power generating module owners to submit the PGMD later.

The reference in current Article 7(3)(f) of NC RfG is deemed sufficient for promoting further harmonisation through the European standards. ACER considers that details regarding the itemised statement of compliance may be prescribed through the national regulatory framework. By definition, these new generation technologies (prototypes) should be limited in numbers and in location and therefore this should better be covered by robust national regulatory frameworks.

### Table: Section of proposed amendment

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<td><strong>NC RfG</strong></td>
<td>WindEurope, Enercon, KCOrc</td>
<td>Article 7(3), Article 31, Article 32</td>
<td>The provision that the facility owner may rely on equipment certificates for PGM of type B and C as well, to ensure their compliance with the requirements of RfG.</td>
</tr>
<tr>
<td><strong>NC RfG</strong></td>
<td>Moeller Operating Engineering GmbH</td>
<td>Article 40</td>
<td>The proposal that the facility owner may rely on equipment certificates for PGM of type B and C as well, to ensure their compliance with the requirements of RfG.</td>
</tr>
<tr>
<td><strong>NC RfG</strong></td>
<td>Enercon</td>
<td>Article 40(4), Article 41</td>
<td>The stakeholder proposes to amend the wording by providing that compliance tests or simulations cannot be carried out as required by the relevant system operator due to reasons not attributable to the power generating facility owner, then the relevant system operator shall not unreasonably withhold the operational notification referred to in Title III.</td>
</tr>
<tr>
<td><strong>NC RfG</strong></td>
<td>Enercon</td>
<td>Article 42</td>
<td>The stakeholder notes that requesting that “all relevant” signals are recorded is too open, and questions which shall decide what includes “all”. It was also proposed to delete the provision in the paragraph 4 that would require PGF owners’ representatives be on site in any case for the entire testing period, while the SOs representatives may decide to attend remotely.</td>
</tr>
<tr>
<td><strong>NC RfG</strong></td>
<td>Enercon</td>
<td>Article 48</td>
<td>The stakeholder proposes to amend paragraph 6(b) providing that the reactive power capability test shall be carried out at “at two reactive power set points defined by the relevant power system operator (within the maximum reactive power range)”, arguing that DGSOs typically do not want PPMs to test the full Q capability in the field, as this would influence the local voltage too much and consequences for other connected parties are feared. The modified wording could allow a RSO to test extreme Q values, but they do not have to go to extremes.</td>
</tr>
<tr>
<td><strong>NC RfG</strong></td>
<td>RES Group</td>
<td>Article 15(5)(c)(i)</td>
<td>The stakeholder considers that Article 15(5)(c)(i) requires PGFO to provide EMT simulation model if requested. This is a significant increase in requirements and will incur extra costs and project delay of up to 1 year and should therefore be justified in every case it is requested. It is unlikely that type C PGMs will require EMT simulation. Unless justified, this requirement for EMT simulation models should be removed from type C PGMs and applied to type D PGMs.</td>
</tr>
<tr>
<td><strong>NC RfG</strong></td>
<td>VGBE</td>
<td>Article 15(5)(c)</td>
<td>The stakeholder proposes to include a paragraph that the relevant system operator shall specify whether a study is required, and define the scope and extent of that study, to demonstrate that no adverse interaction will occur when one or more HVDC converter stations or large PPMs are within close electrical proximity of a new to build installation.</td>
</tr>
</tbody>
</table>

Relevant interaction studies, among other studies, are not excluded from the NC RfG. Indeed, Article 15(5)(c) requires simulation models to properly reflect the behaviour of the power generating module for the relevant study purpose, including interaction studies.
<table>
<thead>
<tr>
<th>Applicable NC</th>
<th>Respondents</th>
<th>Section of proposed amendment</th>
<th>Summary of respondents’ response</th>
<th>ACER views</th>
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</thead>
<tbody>
<tr>
<td>NC RfG and NC DC</td>
<td>Moeller Operating Engineering GmbH, EFAC</td>
<td>Article 41 (NC RfG) and Article 35(5) (NC DC)</td>
<td>The stakeholders propose to specify that the compliance-monitoring can be delegated to third parties “including authorised certifiers”, as an option to raise the quality of service in critical aspects of compliance monitoring.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>EDP, E-REDES, Eurelectric, EU DSO, Enel Group</td>
<td>Article 4, Article 41</td>
<td>Some stakeholders argue that that Article 41 does not describe what actions should be made in case the power-generating facility is no longer compliant with the regulation. The stakeholders propose to establish the incentives for the power-generating facility owner to rectify the source of the non-compliance in the agreed deadlines. One stakeholder argues that the NC RfG does allow a RSO to refuse the connection of a non-compliant PGM. However, there is no legal recourse in the NC RfG for remedying a PGM which becomes, or is found to be, non-compliant over its lifetime. The stakeholder proposes that the RfG requires Member States to have an effective national process to deal with non-compliance within 1 year of entry into force of the regulation. One stakeholder proposes to add a new paragraph 7 that would establish the procedure in case of non-compliance.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>EU Turbines</td>
<td>Article 41, Article 42</td>
<td>The stakeholder proposes to add a paragraph regarding establishing procedures permitting generating units to be connected to the grid with the purpose of conducting tests and verifications. In addition, it is proposed to allow the use of alternative or same set of tests carried out in a different facility provided that these tests are efficient and suffice to demonstrate that a power-generating module complies with the requirements of this regulation.</td>
<td>Disagree</td>
</tr>
<tr>
<td></td>
<td></td>
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</tr>
<tr>
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</tr>
<tr>
<td>NC RfG</td>
<td>BDEW, VDE FNN, Verband der Automobilindustrie, CharIn, undisclosed stakeholders</td>
<td>Article 42(5)</td>
<td>The stakeholders suggest that technology openness must be guaranteed. It should be clarified if compliance with the requirements of this regulation can be verified only by certification of the V2G electric vehicle supply equipment, the V2G electric vehicle is not subject to a certification requirement. Certification of the V2G electric vehicle as part of an electricity storage module leads to the need to store digital certificates in the V2G electric vehicle. These digital certificates must be verified (according to authenticity and validity) before each re-charging session within the V2G electric vehicle supply equipment. To establish such a system, it will take years, because a chain of trust (Public Key Infrastructure (PKI)) needs to be established and operated. Besides resources it will also require the willingness of all parties involved to implement such a system. The more effective way is to certify only the stationary V2G electric vehicle supply equipment for being able to monitor the behaviour of the inverter installed in the V2G electric vehicle in the case of AC charging and to prevent charging in the case of misbehaviour by opening the V2G electric vehicle supply equipment switching-device. Besides monitoring especially, the interface protection and islanding detection part can be fully implemented and certified on V2G electric vehicle supply equipment side. The stakeholders also suggest that if compliance with the requirements of NC RfG can be verified only by certification of the V2G electric vehicle supply equipment, the V2G electric vehicle must not be certified at all. Proposal to review as: &quot;Concerning V2G electric vehicle and V2G electric vehicle supply equipment, compliance shall be based on individual type-test certificates issued as per Regulation (EC) No 765/2008 regarding the V2G electric vehicle supply equipment on one side and the V2G electric vehicle homologated platform (in case of AC V2G) on the other side. A certification shall include for instance the data exchange protocol, or system performance criteria, associating the V2G electric vehicle supply equipment and the V2G electric vehicle homologated platform. The individual type-test certificates shall enable interoperability between different V2G electric vehicles and V2G electric vehicle supply equipment.&quot;. The stakeholders pose questions/remarks to different terms and definitions: &quot;Type-test certificates&quot;: Are these similar to equipment certificates? &quot;Regulation (EC) No 765/2008&quot;: Does this mean that the EV will also have to have a CE mark? &quot;V2G electric vehicle homologated platform&quot;: Here, an in-vehicle charging system, which can be used in different electric vehicle platforms, is meant. &quot;Data exchange protocol&quot;: The communication protocol between EVSE and EV like ISO 15118 is meant, and not the communication protocol between EVSE and system operator. &quot;System performance criteria&quot;: Please define this term more closely in NC RfG. Is data exchange protocol referring to ISO 15118-20 for AC V2G or is it the data exchange interface of the EVSE to the relevant system operator as required? What does &quot;associating&quot; mean? Interoperability between different EVSE and EV should be still given.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Eurelectric</td>
<td>Article 44, Article 47</td>
<td>The stakeholder suggests that the requirement of Article 44 should include compliance testing of the information exchange system. Information exchange between the relevant system operator and the power-generating module is critical for the system operation. Testing of the information exchange ensures the relevant system operator that the communication works as intended</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Eurelectric</td>
<td>Article 48(6)(a)</td>
<td>The stakeholder suggests removing the testing requirement of reactive power capability for the U-Q/Pmax profile, because it is not possible to change the voltage in the grid to make a sufficient test.</td>
<td>Disagree</td>
</tr>
</tbody>
</table>

ACER's proposal does not prescribe for digital certificates to be stored in the V2G electric vehicles. In fact, the proposed wording leaves room for different options.

The provision concerning the data exchange protocol, system performance criteria, associating the V2G electric vehicle supply equipment and the V2G electric vehicle homologated platform has been removed and clarity on the separation of certification of V2G EV and V2G EVSE has been introduced.

The V2G electric vehicle should be certified attesting that the on-board converter is compliant with the applicable provisions of the NC RfG.
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<td>NC RfG</td>
<td>EUROPGEN, WindEurope</td>
<td>Article 51(2)(d), Article 51(3)(a), Article 52(2)(d), Article 55(2)(d), Article 55(7)(c)</td>
<td>The stakeholders state that the wording of ‘stability compliance’ is ambiguous. They pose the following questions: What is a stability compliance? A statement of compliance? Certificate of compliance? Simulation report? They suggest making the wording more comprehensible.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>EUROPGEN</td>
<td>Article 51(3)(b)</td>
<td>The stakeholder states that Article 51(3) refers to the reactive power capability simulation and point (b) of said article refers to point (a) of Article 14(3). But this refers to fault-ride-through capability of power-generating modules and does not contain reactive power control requirements.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Eurelectric, CEZ</td>
<td>Article 52(4), Article 54, Article 55(4)</td>
<td>The stakeholder suggests that the requirement regarding simulation of island operation following Article 52(4) should only be required if stated by the relevant system operator.</td>
<td>Partly agree</td>
</tr>
</tbody>
</table>

ACER agrees with the need to clarify the provisions. Relevant amendments have been introduced in the NC RfG.

ACER agrees with the need to correct the reference. Relevant amendments have been introduced in the NC RfG.

The provision with regard to the island operation simulation refers to the conditions set out in Article 15(4) regarding the non-mandatory requirement for island operation.
<table>
<thead>
<tr>
<th>Response refers to</th>
<th>Name of stakeholder(s)</th>
<th>Reference to Article(s) / paragraph(s) corresponding to ACER’s draft NC proposed amendments</th>
<th>Summary of respondents’ response</th>
<th>ACER position</th>
<th>Reasoning</th>
</tr>
</thead>
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<tr>
<td>NC RfG</td>
<td>VDMA e.V.</td>
<td>Article Y(5), Article Y(8)</td>
<td>The stakeholder proposes to define the behaviour for grid forming in more detail.</td>
<td>Disagree</td>
<td>The differing situations in the Member States necessitate that the NC RfG provides only for non-exhaustive requirements. The determination of precise technical details must therefore be left to the approval procedure under Article 7 of the NC RfG, by which grid forming requirements will be specified by the designated entities of each Member State.</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Avere France and ATEE, Renault</td>
<td>Article 14a(7)</td>
<td>The stakeholder proposes to define grid forming in order to better understand the requirement with regard to its application to EV3 electric vehicles and associated V2G electric vehicle supply equipment.</td>
<td>Disagree</td>
<td>Article Y(5) to (8) of the consulted amendment proposal already determines this non-exhaustive requirement. Article 14a(7) of the consulted amendment proposal refers to that provision. Relevant standards shall define relevant details. Also, a prospective Implementation Guidance Document by ENTSO-E can bring additional clarifications.</td>
</tr>
<tr>
<td>NC RfG</td>
<td>CENELEC</td>
<td>Article Y(5), Article Y(8), Article 55(4)(c)</td>
<td>As regards Article Y(5), the stakeholder suggests that grid forming needs to be specified mutually between the relevant TSO and the relevant system operator by an agreement.</td>
<td>Disagree</td>
<td>An agreement approach would lead to the application of Article 7(5) instead of Article 7(1). Hence, the relevant TSO and the relevant system operator (RSO) would have to endeavour to seek an agreement and if they fail, each party may request the relevant regulatory authority to issue a decision within six months. This would have several negative implications: - Different procedural paths with differing actors and timelines would apply to grid forming requirements vis-à-vis other requirements, while grid forming and other general requirements, such as LFSM, fast fault current and respective notification procedure provisions, are interrelated. - Grid forming requirements should be treated as general requirements because they serve the frequency stability of the entire interconnected network. Therefore, a fragmentation should be avoided by applying Article 7(1) with its broader scaled harmonisation approach. - The concerns of the RSOs (unintended islanding, oscillations, other stability concerns) are of a structural nature. These concerns should therefore be addressed in a uniform manner rather than on a network specific case-by-case basis. - It would be inefficient to have a legal framework in place where each individual RSO negotiates individual requirements with each relevant TSO.</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Oesterreichs Energie</td>
<td>Article 2(34)</td>
<td>The stakeholder proposes a minor modification of the definition of “synthetic inertia” by using the word “emulate” instead of the word “replace” with regard to the effect of inertia of a synchronous power-generating module.</td>
<td>Partly agree</td>
<td>The current legal definition of “synthetic inertia” needs improvements as regards its precision and completeness. Instead of actually defining this technical term, it only explains the desired effect of synthetic inertia, namely the substitution (“replace”) of the inertia provided by synchronous power-generating modules. The proposed definition is precise and complete, based on the proposal of ENTSO-E and Oesterreichs Energie.</td>
</tr>
</tbody>
</table>

**Section of proposed amendment:**

- Article Y(5), Article Y(8)
- Article 14a(7)
- Article Y(5), Article Y(8), Article 55(4)(c)
- Article 2(34)
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<tr>
<td>NC RfG</td>
<td>Undisclosed Stakeholder</td>
<td>Article Y(5)</td>
<td>The stakeholder proposes to introduce the possibility of the relevant system operator to request a switch from grid forming to grid following mode.</td>
<td>Disagree</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Article Y(5)</td>
<td>The stakeholder suggests that before the introduction of the grid forming requirement in the RfG in the foreseen rather short implementation time period, there should be a standard or a guideline which clearly defines the requirements for its implementation.</td>
<td>Disagree</td>
</tr>
<tr>
<td></td>
<td>VGBE</td>
<td>Recital 28 and Article 60</td>
<td>The stakeholder proposes to give ACER the authority to introduce a derogation at Union level for new requirements for the lack of practical experience with grid forming.</td>
<td>Disagree</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Article 13(14)(b), Article Y(5)</td>
<td>The stakeholder requests a definition of grid forming capability.</td>
<td>Disagree</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Article 20(4), Article 21(4)</td>
<td>The stakeholder requests for clarification as to whom will impose grid forming and would prefer the competence to lay with ACER. Further, the stakeholder proposes to add the notion “imposed by ACER” or “when imposed by ACER” to the legal text.</td>
<td>Disagree</td>
</tr>
</tbody>
</table>

The consulted amendment proposal includes such switching possibilities in Article Y(7) and Article Y(8)(d). Following the proposal of several stakeholders, including ENTSO-E and the EU DSO Entity, these switching possibilities have been removed from the draft NC RfG. Obliging PPM owners to provide two modes of operation, grid forming mode and grid following mode, would significantly increase the complexity of design and consequently the manufacturing costs. This also affects the compliance procedures and thus the certification costs. Furthermore, factual uncertainty could lead to an abundant use of the deactivation option which could in hindsight prove to be a redundant use of that tool. The latter would put at risk the availability of an effective and reliable amount of grid forming PPMs.

Article 72 provides the relevant TSOs, RSOs and designated entities with sufficient implementation time to introduce precisely the missing standards referred to by the stakeholder, namely by determining the precise technical details during the approval procedure under Article 7 of the NC RfG on the basis of which grid forming requirements will be specified by the designated entities of each Member State.

The objective of the grid connection codes is to harmonise the grid connection requirements throughout the Union as much as possible. Derogations should therefore be the exception which should only be used where local circumstances should be exceptionally taken into account. For example, where compliance with the grid connection rules could jeopardise the stability of the local network or where the safe operation of a specific power-generating module might require operating conditions that are not in line with the NC RfG, as pointed out in Recital 28 of the current NC RfG. The national authorities are in a better position to assess local and site specific circumstances.

The basic technical design criteria for grid forming power park modules are provided in Article Y(8) and Article 20(4) and Article 21(4) of the consulted draft. The precise technical details of these basic criteria will be established in the approval procedure under Article 7 by which grid forming requirements will be specified by the designated entities of each Member State.

Taking into account the changes proposed by inter alia ENTSO-E and the EU DSO Entity, some specific type B and C PPMs and all type D PPMs should mandatorily provide grid forming, meaning that it should neither be within the discretion of the relevant TSO to trigger the approval process nor within the discretion of the designated entity to issue the approval decision under Article 7, rather these are obligations (neither “may” nor “if” nor “when”, but rather “shall”).

The proposed addition to the legal text would raise legal uncertainty as to whether there shall be an additional decision-making process. The consulted draft uses the established law-making trick of the grid connection codes by attributing the right and obligation to specify the non-exhaustive requirement to the relevant TSO and thereby opening the approval procedure under Article 7. This way it is clear that the “imposition” follows from the designated entity of each Member State. In most Member States the designated entity is the national regulatory authority while in other Member States other entities are designated (e.g., the VDE (FNN) in Germany).

As to the proposed competence of ACER, the differing situations in the Member States demand that the determination of precise technical details must be left to be specified by the designated entities of each Member State.
The stakeholder proposes to completely refrain from grid forming requirements in the NC RfG to avoid additional conversion costs for operators of existing plants and to avoid inefficiency and costs for consumers. Instead, system operators should design market-based tenders, such as specified auctions, to procure grid forming capable PGMs in a cost-effective manner.

Article 20(2)(b)  
The stakeholder does not support the deletion of the fast fault current requirement for type B PPMs.

Agree  
Fast fault current requirements are only redundant for grid forming PPMs, not for grid following PPMs.

Article Y(5) and (8)  
The stakeholder notes discrepancies between Y(5) and Y(8) and requests for clarification as to whether the grid forming capability is mandatory in all circumstances or only when specified by the relevant TSO in coordination with relevant system operator.

Agree  
Under the consulted amendment proposal, grid forming capabilities are non-mandatory requirements for type A PPM (“may” in Article Y(5)) and mandatory requirements for type B and C (according to specified conditions) and for type D PPM. The latter means that it is neither within the discretion of the relevant TSO to trigger the approval process nor within the discretion of the designated entity to issue the approval decision under Article 7, rather these are obligations.

Article Y(8)(a)  
The stakeholder proposes to limit the scope of the grid forming requirements by referring to all technical limits of PPM, such as their mechanical limits, instead of only referring to their current and energy limits.

Disagree  
A reference to all technical limits would deprive the grid forming requirement provisions of their purpose, i.e., to enhance design and development of PPMs with regard to grid forming capabilities.

Article Y(8)(a)  
Adequate grid forming performance at the connection point should be sufficient, mandating grid forming performance by every individual unit is overly restrictive.

Disagree  
While the Thévenin-source like behaviour must be determined at the terminals of the individual unit(s) for reasons of robustness, the inherent energy storage or the additional energy beyond the inherent energy storage may be installed within the individual units or with additional components. Both would contribute equally to the provision of synthetic inertia as part of the grid forming capability of the PPM which would have to be complied with at the connection point.

Article Y(8)(d)  
The stakeholder argues that the capability to activate or deactivate grid forming mode is likely to cause significant costs and if it is retained must be subject to robust cost benefit analysis.

Agree  
Obliging PPM owners to provide two modes of operation, grid forming mode and grid following mode, would significantly increase the complexity of design and consequently the manufacturing costs. This also affects the compliance procedures and thus the certification costs.

Article 20(1) and (4)  
The stakeholder requests clarification in the legal text as to whether the grid forming mode will be required for all PPMs, but the capability of (de-)activating grid forming mode will not be required from PPM ≥ 10 MW, and that grid forming mode must be permanently activated by PPM ≥ 10 MW.

Disagree  
The consulted proposal amendment of the NC RfG is clear in this regard. However, the revisions will provide that for certain type B PPM with Pmax ≤ 10 MW grid forming will be a non-mandatory capability.

Article Y(8)(d)  
The stakeholder argues that if grid following is allowed, all the simulations and site tests also have to be conducted for grid following and not only for grid forming.

Agree  
Obliging PPM owners to provide two modes of operation, grid forming mode and grid following mode, would significantly increase the complexity of design and consequently the manufacturing costs. This also affects the compliance procedures and thus the certification costs.

As regards Article 2, the stakeholder proposes a definition of “grid forming” as follows: “Upon detecting grid outage, the main break shall be opened, a PPM shall be disconnected from the main grid, then form a grid and supply local load.”

Disagree  
Under the stakeholder’s proposal, a stable synchronous operation would be jeopardised.

As regards Article 14a(8), the stakeholder proposes to give the relevant TSO the right to request grid forming capability to supply local load.

Disagree  
It is not the task of the system operator to satisfy the demand for electricity. Grid forming capability is a means for grid stability, not for generation adequacy.
<table>
<thead>
<tr>
<th>NC RfG</th>
<th>Enercon Global GmbH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Article 2</td>
<td>The stakeholder suggests that in Article 2(33) and (34), the definitions of &quot;inertia&quot; and &quot;synthetic inertia&quot; need to be changed in order to better reflect the electrical context.</td>
</tr>
<tr>
<td>Article 2(78) and Article Y(8)(c)</td>
<td>The stakeholder suggests that the definition of &quot;inherent energy storage&quot; in Article Y needs to be removed to Article 2 and changed in order to better reflect that the PPM owner decides if the storage can be used for grid forming purposes.</td>
</tr>
<tr>
<td>Article Y(5)</td>
<td>As regards Article Y(5), the stakeholder is opposed to any mandatory requirements and advocates for market-based solutions leaving it to the manufacturers to weigh additional technology development costs with anticipated returns, allowing for a cost-efficient deployment of grid-forming capabilities.</td>
</tr>
<tr>
<td>Recital (25)</td>
<td>As regards Recital (25), the stakeholder proposes to include a recital as follows: Some technologies are connected through inverters with power electronics for which no requirement was existing regarding any (synthetic) inertia contribution. Countermeasures should be adopted to avoid a larger RoCoF and facilitate further expansion of such converter-based generation which do not naturally contribute to inertia.</td>
</tr>
<tr>
<td>Article Y(8)</td>
<td>A clarification could be added in Article Y(8) of the consulted draft as to provide that for any requirements about grid forming, synthetic inertia and fast-fault-current injections the relevant TSO (or RSO) shall publish specific definitions of certain physical quantities, such as voltage, current, phase and phase angle, frequency, active power and reactive power, which suit the sub-cycle character of these phenomena prior to the introduction of any requirement about grid forming or synthetic inertia and subject to stakeholder consultations.</td>
</tr>
<tr>
<td>Article 21(4)</td>
<td>Whether an energy storage can inherently serve for grid forming purposes must neither be left to the discretion of the TSO/RSO nor to the opinion of the PPM owner. Rather it must be determined objectively, hence by its technical term, it only explains the desired effect of synthetic inertia, namely the substitution (&quot;replace&quot;) of the inertia provided by synchronous power-generating modules. The proposed definition is precise and complete, based on the proposal of ENTSO-E and Oesterreichs Energie.</td>
</tr>
<tr>
<td>Article 14a(8)</td>
<td>The legal framework for grid forming capabilities consists of three pillars: Grid connection requirements, ancillary services under Articles 31 and 40 of Directive (EU) 2019/944 and fully integrated network components. The three pillars complement each other. Legally binding grid connection requirements may serve as a jump start for investments in the new technology. The PGM owners willing to participate in any market-based procurement need the new technology available before they can participate in any corresponding tender procedure. There is a risk that this chicken and egg problem will remain if there are no binding grid connection requirements in place.</td>
</tr>
<tr>
<td>Article 4(27)</td>
<td>If the three pillars complement each other, a clarification has to be added in Article 4(27) of the consulted draft that no requirement was existing for any (synthetic) inertia contribution.</td>
</tr>
</tbody>
</table>

**Table 1: Summary of respondents’ response and ACER views**

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<td>The stakeholder suggests that in Article 2(33) and (34), the definitions of &quot;inertia&quot; and &quot;synthetic inertia&quot; need to be changed in order to better reflect the electrical context.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>Article Y(8)(c)</td>
<td>Enercon Global GmbH</td>
<td>The stakeholder suggests that the definition of &quot;inherent energy storage&quot; in Article Y needs to be removed to Article 2 and changed in order to better reflect that the PPM owner decides if the storage can be used for grid forming purposes.</td>
<td>Disagree</td>
</tr>
<tr>
<td>Article Y(5)</td>
<td>Enercon Global GmbH</td>
<td>As regards Article Y(5), the stakeholder is opposed to any mandatory requirements and advocates for market-based solutions leaving it to the manufacturers to weigh additional technology development costs with anticipated returns, allowing for a cost-efficient deployment of grid-forming capabilities.</td>
<td>Disagree</td>
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<tr>
<td>Recital (25)</td>
<td>Enercon Global GmbH</td>
<td>As regards Recital (25), the stakeholder proposes to include a recital as follows: Some technologies are connected through inverters with power electronics for which no requirement was existing regarding any (synthetic) inertia contribution. Countermeasures should be adopted to avoid a larger RoCoF and facilitate further expansion of such converter-based generation which do not naturally contribute to inertia.</td>
<td>Partly agree</td>
</tr>
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<tr>
<td>Article Y(5)</td>
<td>The stakeholder suggests that, because it is complex to determine if grid forming capability is to be achieved at the connection point, or at the terminals of the individual unit (or component), neither of them should be mentioned without context, but rather where it is defined in detail and with the complete context.</td>
<td>Disagree</td>
<td>While the Thevenin-source like behaviour must be determined at the terminals of the individual unit(s) for reasons of robustness, the inherent energy storage or the additional energy beyond the inherent energy storage may be installed within the individual units or with additional components. Both would contribute equally to the provision of synthetic inertia as part of the grid forming capability of the PPM which would have to be complied with at the connection point. All of this is adequately reflected in the consult draft.</td>
</tr>
<tr>
<td>Article Y(6)</td>
<td>The stakeholder proposes to add the notion &quot;In case specified in accordance with Article Y(5)&quot;.</td>
<td>Partly agree</td>
<td>The phrase “Where grid forming capability is specified by the relevant TSO in coordination with the relevant system operator” has been added to clarify.</td>
</tr>
<tr>
<td>Article Y(8(a))</td>
<td>The stakeholder suggests that grid forming requirements should leave the flexibility that the requirement is met either within the individual units or with additional components.</td>
<td>Partly agree</td>
<td>While the Thevenin-source like behaviour must be determined at the terminals of the individual unit(s) for reasons of robustness, the additional energy beyond the inherent energy storage may be installed within the individual units or with additional components. Both would contribute equally to the provision of synthetic inertia as part of the grid forming capability of the PPM which would have to be complied with at the connection point. All of this is adequately reflected in the consult draft.</td>
</tr>
<tr>
<td>Article Y(8(a))</td>
<td>The stakeholder proposes to limit the scope of the grid forming requirements by referring to all technical limits of PPM, such as their mechanical limits, instead of only referring to their current and energy limits.</td>
<td>Disagree</td>
<td>A reference to all technical limits would deprive the grid forming requirement provisions of their purpose, i.e., to enhance design and development of PPMs with regard to grid forming capabilities.</td>
</tr>
<tr>
<td>Article Y(8(d))</td>
<td>The stakeholder proposes to delete the obligation to provide the capability to active and deactivate grid forming mode.</td>
<td>Agree</td>
<td>Obliging PPM owners to provide two modes of operation, grid forming mode and grid following mode, would significantly increase the complexity of design and consequently the manufacturing costs. This also affects the compliance procedures and thus the certification costs. Relevant changes have been introduced in the legal text.</td>
</tr>
<tr>
<td>As regards Article 2(34), the stakeholder proposes a modification of the definition of “synthetic inertia” with the aim to improve its clarity.</td>
<td>Agree</td>
<td>The current legal definition of “synthetic inertia” needs improvement as regards its precision and completeness. Instead of actually defining the technical term, it only explains the desired effect of synthetic inertia, namely the substitution (“replace”) of the inertia provided by synchronous power generating modules. The proposed definition is precise and complete, based on the proposal of ENTSO-E and Oesterreichs Energie.</td>
<td></td>
</tr>
<tr>
<td>As regards Article Y(6), the stakeholder highlights that the consulted draft of Article Y(6) refers to a derogation from Article 4(2) in its entirety, while effectively only derogating from Article 4(2)(b), implying that the provision should be redrafted.</td>
<td>Disagree</td>
<td>If Article Y(6) would explicitly order the derogation only from Article 4(2)(b), legal uncertainty might arise about the scope of the concept of grid forming with regard to grid forming capabilities of power park modules already connected to the network on the date of entry into force of the new NC RfG.</td>
<td></td>
</tr>
<tr>
<td>As regards Article Y(6), the stakeholder proposes to add a reference to grid forming.</td>
<td>Agree</td>
<td>Useful clarification in order to limit the scope of application of this specific grandfathering provision to grid forming, i.e., to avoid an application to all technical requirements of PPMs. A relevant amendment was introduced in the NC RfG.</td>
<td></td>
</tr>
<tr>
<td>As regards Article 2(34), Article Y(7), Article Y(8), Article 20(1) and Article 20(2) Article 23, the stakeholder proposes to delete the relevant system operators’ obligation to activate and deactivate the PPM’s grid forming mode and the corresponding obligation of the PPM owner to provide the capability to activate and deactivate grid forming mode, since it would increase costs and thereby potentially make grid forming PPMs uneconomical.</td>
<td>Agree</td>
<td>Obliging PPM owners to provide two modes of operation, grid forming mode and grid following mode, would significantly increase the complexity of design and consequently the manufacturing costs. This also affects the compliance procedures and thus the certification costs. Furthermore, factual uncertainty could lead to an abundant use of the deactivation option which could in hindsight prove to be a redundant use of that tool. The latter would put at risk the availability of an effective and reliable amount of grid forming PPMs. Relevant changes have been introduced in the legal text.</td>
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<td>As regards Article Y(7) and Article 20 (1), the stakeholder proposes to provide that grid forming capability becomes a mandatory requirement for: - all type C and D PPMs, - all type B PPMs at and above the 110 kV voltage levels, - all type B PPMs below 110 kV if directly connected to a substation (bus-bar) with a feeder dedicated to one or more PPMs connected to a substation with transformation to 110 kV or above voltage levels. Grid forming capability should become a non-mandatory requirement for: - all other type B PPMs under the conditions determined by the Member State or the entity designated by the Member State in a formal process (“roadmap”) developed to assess a further roll-out of the grid forming capability, including, if deemed necessary, an impact assessment on island mode detection. - the Member State or the entity designated by the Member State shall provide the formal and substantive conditions under which the relevant system operator may conduct grid forming specification for type A PPM.</td>
<td>Partly agree</td>
</tr>
<tr>
<td></td>
<td></td>
<td>As regards Article Y(8)(c)(i) and (iii) the stakeholder suggests that the term “voltage stability” should be used instead of the term “voltage control”. The relevant system operator should coordinate with the relevant TSO when specifying additional requirements regarding the contribution of active and reactive power.</td>
<td>Agree</td>
</tr>
<tr>
<td></td>
<td></td>
<td>As regards Article 20(2)(b) and (c), the stakeholder does not support the deletion of the fast fault current requirement for type B PPMs when they are in grid following mode.</td>
<td>Agree</td>
</tr>
<tr>
<td></td>
<td></td>
<td>As regards Article 23, the stakeholder suggests that offshore power park modules should also have grid forming capabilities</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>EU DSO Entity</td>
<td>As regards Article Y(6), the stakeholder argues that this is not a derogation but an exclusion from the application of the regulation and that the provision should refer to Article 4(1) instead of Article 4(2).</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>ACCIONA</td>
<td>The stakeholder proposes to add to this recital that the regulatory authority should consider if advanced capabilities are to be provided in accordance with mandatory requirements (supported by a full, publicly consulted cost-benefit analysis) or if some should be provided as ancillary services.</td>
<td>Partly agree</td>
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<td>NC RIG</td>
<td>ACCIONA</td>
<td>Article 2(76) (new)</td>
<td>The stakeholder argues that there should be a definition of grid-forming. The potential co-existence of different definitions of grid-forming is against the development and certification of standardised mass-market products, thus impacting in costs and technical complexities. The stakeholder does not propose a wording for the definition.</td>
</tr>
<tr>
<td>NC RIG</td>
<td>ACCIONA</td>
<td>Article Y(5) and (8), Article 20(1) and (4), Article 21(1) and (4), Article 22(1)</td>
<td>The stakeholder considers that it is important to specify that the relevant TSO in coordination with the relevant system operator shall technically justify that power park modules shall be capable of providing grid forming capability at the connection point. It is argued that a specific process must be designed to define under which circumstances the TSO may require grid forming capabilities. PGM owners and manufacturers should know in advance if the PGM is going to be able to grid forming or not. Different parameters shall be analysed.</td>
</tr>
<tr>
<td>NC RIG</td>
<td>ACCIONA</td>
<td>Article Y(8)</td>
<td>The stakeholder proposes to amend the wording so that the obligation to provide grid forming capability depends on the availability of the primary resource.</td>
</tr>
<tr>
<td>NC RIG</td>
<td>ACCIONA</td>
<td>Article Y(8)(a)</td>
<td>The stakeholder proposes to delete the reference to the terminals of the individual units.</td>
</tr>
<tr>
<td>NC RIG</td>
<td>ACCIONA</td>
<td>Article Y(8)(d)</td>
<td>The stakeholder proposes to delete the provision since the capability of the PPM to act in grid forming and grid following mode would have a significant impact on costs.</td>
</tr>
<tr>
<td>NC RIG</td>
<td>ACCIONA</td>
<td>Article 20(2)</td>
<td>The stakeholder does not agree with the deletion of the paragraph, as it needs to be maintained in particular for grid following PPMs.</td>
</tr>
<tr>
<td>NC RIG</td>
<td>AEE</td>
<td>Recital (25) **</td>
<td>The stakeholders propose to add to this recital that the regulatory authority should consider if advanced capabilities are to be provided in accordance with mandatory requirements (supported by a full, publicly consulted cost-benefit analysis) or if some should be provided as ancillary services.</td>
</tr>
<tr>
<td>NC RIG</td>
<td>AEE</td>
<td>Article 2(78) and Article Y(8)(c)</td>
<td>The definition of “inherent energy storage” in Article Y needs to be moved to Article 2 and changed in order to better reflect that the manufacturer determines if the storage can be used for grid forming purposes.</td>
</tr>
<tr>
<td>NC RIG</td>
<td>AEE</td>
<td>Article 2(79) (new)</td>
<td>The stakeholder argues that there should be a definition of grid-forming. The potential co-existence of different definitions of grid-forming is against the development and certification of standardised mass-market products, thus impacting in costs and technical complexities. The stakeholder does not propose a wording for the definition.</td>
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The basic technical design criteria for grid forming power park modules follows from Article Y(8) (and Article 20(4) and Article 21(4)) of the consulted draft. The precise technical details of these basic criteria will be established in the approval procedure under Article 7 by which grid forming requirements will be specified by the designated entities of each Member State.
The stakeholder considers it is important to specify that the relevant TSO in coordination with the relevant system operator shall technically justify that power park modules shall be capable of providing grid forming capability at the connection point. It is argued that a specific process must be designed to define under which circumstances the TSO may require grid forming capabilities. PGM owners and manufacturers should know in advance if the PGM is going to be able to be grid forming or not. Different parameters shall be analysed.

Partly agree

Under Article Y(5) of the consulted draft, the TSO may specify grid forming capabilities for type A PPM, which means that the establishment for this requirement for type A PPM is non-mandatory from a Union law perspective. The same approach should apply to specific type B PPMs, following partially ENTSO-E’s new proposal. The technical justification for these PPMs can in any event be carried out under the approval procedure of Article 7, see in particular Article 7(3) of the consulted draft.

The stakeholder notes that three years seems to be a short time to implement a mandatory requirement as grid forming is not yet a mature developed technology. Grid forming requirements are not yet exhaustively defined and therefore not properly modelled and tested for a large-scale deployment.

Disagree

Article Y(6) establishes a grandfathering rule according to which instead of the general 2-year-grandfathering of Article 4(2), 3 years are granted with regard to grid forming capability. Article 72 will provide a three-year implementation grace period. Three years seems adequate, considering the urgent need of grid forming PPMs in order to achieve the Union’s climate targets. The fact that grid forming requirements are not yet exhaustively defined and therefore not properly modelled and tested for a large-scale deployment is exactly the reason why the regulation should trigger precisely such sufficiently defined, modelled and tested requirements under the national specification procedure of Article 7.

The stakeholder proposes to amend the wording so that the obligation to provide grid forming capability depends on the availability of the primary resource.

Disagree

This is a legitimate concern in the matter. However, the NC RfG already fulfils this concern. According to Article 1, all requirements established under the NC RfG are requirements for grid connection. This means that the legal requirements are based on how the PGMs are designed (constructed and/or configured). The legal requirements are not linked to the provision of the provided service, but to the design of the PGM.

Hence, a PPM will have to be constructed and configured in such a way as to be grid forming capable. The PPM will however not need to perform grid forming when such is impossible due to e.g., lack of wind or solar infed.

The stakeholder proposes to delete the reference to the terminals of the individual units.

Disagree

The Thorenin-source like behaviour must be determined at the terminals of the individual unit(s) for reasons of robustness.

The stakeholder proposes to delete the provision since the capability of the PPM to act in grid forming and grid following mode would have a significant impact on costs.

Agree

The risks of unintentional islanding, oscillations and other stability concerns must be considered. The consulted draft tried to address these concerns by obliging PPM owners to provide two modes of operation, grid forming mode and grid following mode. However, this would significantly increase the design and hence the manufacturing costs on the one hand, and the compliance procedures and hence the certification costs on the other hand. Relevant changes have been introduced in the legal text.

The stakeholder does not agree with the deletion of the paragraph, as it needs to be maintained in particular for grid following PPMs.

Agree

Fast fault current requirements are only redundant for grid forming PPMs, not for grid following PPMs.

The stakeholder emphasises the risks for DSOs, especially in terms of unintentional islanding and potentially too much short circuit power in the distribution grid. This would result in diverging requirements for PPM operators and manufacturers. Furthermore, the requirement to provide an activated and a deactivated mode bears the risk for the manufacturer, that the grid forming and grid following mode capabilities are implemented, tested and certified with high efforts, but would never be used. The stakeholder therefore proposes to establish a non-mandatory grid forming requirement which would only apply if the relevant system operator and as far as the contribution to synthetic inertia is concerned also the PPM owner would agree to it.

Disagree

The NC RfG establishes a diverse range of technical requirements for PGMs. Though the statement proposed is not wrong per se, the relations of the requirements should not be pre-empted by mentioning them in the recitals. Otherwise, there is a risk of misinterpretation.

The risks of unintentional islanding, oscillations and other stability concerns must be considered. The consulted draft tried to address these concerns by obliging PPM owners to provide two modes of operation, grid forming mode and grid following mode. However, this would significantly increase the design and hence the manufacturing costs on the one hand, and the compliance procedures and hence the certification costs on the other hand.

Furthermore, factual uncertainty could lead to an abundant use of the deactivation option which could in hindsight prove to be a redundant use of that tool. The latter would put at risk the availability of an effective and reliable amount of grid forming PPMs.

In the light of the fact that grid forming capabilities for PPMs are required to ensure stable operation with the high penetration of non-synchronous generation, the consequence can not be to leave the grid forming capabilities to the discretion of the individual DSOs. Rather, the grid connection codes must strike a balance by establishing mandatory requirements for those PPM where the said concerns do not easily materialise.
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<td>NC RIG</td>
<td>Bundesverband Solarwirtschaft e.V.</td>
<td>Article Y(6)</td>
<td>The stakeholder calls for a guaranteed minimum transition period of at least two years after the specification, arguing that it should not be the problem of the industry, if the TSO and designated entity do not finalize the specification in due time.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Bundesverband Solarwirtschaft e.V.</td>
<td>Article Y(8)</td>
<td>The concept of a mandatory minimum requirement within the inherent capabilities of the PPM should be replaced by market-based provisions of guaranteed contributions of grid forming capabilities.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Bundesverband Solarwirtschaft e.V.</td>
<td>Article 20(2)</td>
<td>The stakeholder does not support the deletion of the fast fault current requirement for merely grid following PPM.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Better Energy</td>
<td>Recital (25) **</td>
<td>The stakeholder points at the risk that there will be many different requirements in the different Member States and markets which will make it difficult for the manufacturers of components. The stakeholder did not introduce a specific proposal for amendment.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>EDF</td>
<td>Article 14a(8)</td>
<td>Regarding the emerging market of V2G, EV and associated supply equipment, the stakeholder suggests a cost-benefit analysis for the grid forming requirement should be provided, before including it in the NC RIG. The stakeholder argues that the requirement would increase the costs of the EV and its supply equipment. The stakeholder therefore proposes to remove this paragraph.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>BDEW</td>
<td>Article 13(14)(b), Article Y(5), Article 20(4), Article 21(4) and Article 22(1)</td>
<td>The stakeholder argues that the need for the provision of grid forming capability by power generating modules (PGMs) and power park modules (PPMs) in the future electricity system is unquestionable. Yet, it has to be carefully arranged how to define the group of PGMs and PPMs which are addressed by a compulsory rule to provide grid forming capability. With regards to the overall efficiency of the power system, it should be assessed whether it is adequate to introduce such a rule for all PGMs and PPMs connected to a certain grid. The stakeholder asks ACER to discuss this aspect and possible alternatives to a mandatory provision (e.g., market-based procurement) in further detail with the different stakeholder groups which would be affected by such a rule.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Enel Group</td>
<td>Article 13(14)(b)</td>
<td>The stakeholder suggests to reference to Article Y(5) and replace “shall fulfil” with “may be required to fulfil.”</td>
<td>Partly agree</td>
</tr>
</tbody>
</table>

**Note:** The table highlights the summary of respondents' responses and ACER views for specific sections of amendments proposed in the document. The responses are categorized as Agree, Partly agree, Disagree, and the views of ACER are also mentioned.
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<td><strong>NC RIG</strong></td>
<td>Enel Group</td>
<td>Recital (**), Article Y(5), (7), (8)(d) and (new9)</td>
<td>The stakeholder states that the effect on the distribution network should be considered. Due to the lack of studies on the effect on distribution networks, the activation/deactivation function is necessary. The stakeholder suggests to explicitly provide that the ‘Member State or the body designated by the Member State shall set out a formal process by which the relevant TSO in agreement with the relevant system operators, may specify that type A power park modules shall be capable of providing grid forming capability at the connection point, as established in Article Y(8). The process shall consider the maintenance and operating procedures, the impact on the distribution network and the eventual necessary interventions on it. Furthermore, the relevant TSO in agreement with the relevant system operator shall require activation or deactivation of grid forming capability if any, as established in Article Y(9).” As an alternative solution, it is proposed that type A shall be excluded from grid forming capability.</td>
<td>Partly agree</td>
</tr>
<tr>
<td><strong>NC RIG</strong></td>
<td>Enel Group</td>
<td>Article 20(1) and (4), Article 21(1) and (4) and Article 22(1)</td>
<td>To avoid any risk and collateral effects in terms of security of operation and safety for distribution system, the proposal is to introduce the grid forming capabilities in a mandatory way only for type B and type C PPMs which are directly connected to a voltage level equal or above 110 kV or at busbars of substations of relevant system operators. For the type B and type C PPMs below 110 kV, the capability should be carefully assessed and agreed between TSO and relevant system operators. Moreover, the activation/deactivation of GFCs should always be possible as mentioned in the new Article Y(9).</td>
<td>Partly agree</td>
</tr>
<tr>
<td><strong>NC RIG</strong></td>
<td>SolarPower Europe</td>
<td>Article Y(5), (6) and (8), Article 20(2) and (4) and Article 21(4)</td>
<td>The stakeholder does not support the deletion of the fast fault current requirement for merely grid following PPM.</td>
<td>Agree</td>
</tr>
<tr>
<td><strong>NC RIG</strong></td>
<td>SolarPower Europe</td>
<td>Article Y(5), (6) and (8), Article 20(2) and (4) and Article 21(4)</td>
<td>The stakeholder emphasises the risks for DSOs, especially in terms of unintentional islanding and potentially too much short circuit power in the distribution grid. This would result in diverging requirements for PPM operators and manufacturers. Furthermore, the requirement to provide an activated and a deactivated mode bears the risk for the manufacturer, that the grid forming and grid following mode capabilities are implemented, tested and certified with high efforts, but would never be used. The stakeholder therefore proposes to establish a non-mandatory grid forming requirement which would only apply if the relevant system operator and as far as the contribution to synthetic inertia is concerned, the PPM owner would agree to it.</td>
<td>Partly agree</td>
</tr>
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</table>
It is argued that a specific process must be designed to define capabilities to respond to tender.

The regulator shall consider if three years seems adequate, considering the response in advance if the dynamic performance regarding voltage control.

The concept of a mandatory minimum requirement within the inherent capabilities of the PPM should be replaced by market-based provisions of guaranteed contributions of grid forming capabilities.

According to Article 20(4)(b), the dynamic performance regarding voltage control shall reflect the specified contribution to synthetic inertia. The stakeholder proposes to delete that provision because the dynamic performance referred to would only refer to voltage control and cannot be used to influence synthetic inertia.

The stakeholder asks for a definition of grid forming capability in the NC RfG.

The legal framework for grid forming capabilities consists of three pillars: Grid connection requirements, ancillary services under Articles 31 and 40 of Directive (EU) 2019/944 and fully integrated network components. The three pillars complement each other. Legally binding grid connection requirements may serve as a jump start for investments in the new technology. The PGM owners willing to participate in any market-based procurement need to wait for the technology available before they can participate in any corresponding tender procedure.

The stakeholder notes that three years seems to be a short time to implement a mandatory requirement as grid forming is not yet a maturely developed technology. Grid forming requirements are not yet exhaustively defined and therefore not properly modelled and tested for a large-scale deployment.

The stakeholder proposes to add the notion that "the regulator shall consider if such advanced capabilities are to be provided as in accordance with mandatory requirements, or if some of these shall be provided as ancillary services according to EU Directive 2019/944 of 5 June 2019. Those capabilities to be provided as in accordance with mandatory requirements shall be supported by a full, publicly consulted cost-benefit analysis."

The stakeholder highlights that in order to provide grid forming capabilities, reverse current flows must be tolerated. The stakeholder proposes to refer to Article Y(5) also in Article 20, 21 and 22, hence to leave the decision on whether PPMs should provide grid forming capabilities to the discretion of the TSO, i.e. to make grid forming a non-mandatory requirement.

The stakeholder notes that three years seems to be a short time to implement a mandatory requirement as grid forming is not yet a maturely developed technology. Grid forming requirements are not yet exhaustively defined and therefore not properly modelled and tested for a large-scale deployment.

According to Article 20(4)(b), the dynamic performance regarding voltage control shall reflect the specified contribution to synthetic inertia. The stakeholder proposes to delete that provision because the dynamic performance referred to would only refer to voltage control and cannot be used to influence synthetic inertia.

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<td>Article Y(8)</td>
<td>The stakeholder proposes to remove “at the terminals of the individual unit(s)”, arguing that grid forming capability can be provided either by the PPM itself or by dedicated storage units within the PPM.</td>
<td>Disagree</td>
<td>While the Thevenin-source like behaviour must be determined at the terminals of the individual unit(s) for reasons of robustness, the inherent energy storage or the additional energy beyond the inherent energy storage may be installed within the individual units or with additional components. Both would contribute equally to the provision of synthetic inertia as part of the grid forming capability of the PPM which would have to be complied with at the connection point.</td>
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<td>Article Y(8)</td>
<td>The stakeholder proposes to amend the wording so that the obligation to provide grid forming capability depends on the availability of the primary resource.</td>
<td>Disagree</td>
<td>This is a legitimate concern in the matter. However, the NC RfG already fulfills this concern. According to Article 1, all requirements established under the NC RfG are requirements for grid connection. This means that the legal requirements are based on how the PGMs are designed (constructed and/or configured). The legal requirements are not linked to the provision of the provided service, but to the design of the PGM. Hence, a PPM will have to be constructed and configured in such a way as to be grid forming capable. The PPM will however not need to perform grid forming when such is impossible due to e.g., lack of wind or solar inflow.</td>
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<td>NC RfG</td>
<td>Article Y(8)(d)</td>
<td>The stakeholder notes that the capability to activate or deactivate grid-forming mode could lead to have double products, certification and testing of the PPM and its components.</td>
<td>Agree</td>
<td>Obliging PPM owners to provide two modes of operation, grid forming mode and grid following mode, would significantly increase the design and hence the manufacturing costs and the compliance procedures and hence the certification costs. Furthermore, factual uncertainty could lead to an abundant use of the deactivation option which could in hindsight prove to be a redundant use of that tool. The latter would put at risk the availability of an effective and reliable amount of grid forming PPMs. Relevant changes have been introduced in the legal text.</td>
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<td>NC RfG</td>
<td>Article 20(2)</td>
<td>The stakeholder does not agree with the deletion of the paragraph, as it needs to be maintained in particular for grid following PPMs.</td>
<td>Agree</td>
<td>Fast fault current requirements are only redundant for grid forming PPMs, not for grid following PPMs.</td>
</tr>
<tr>
<td>EDP</td>
<td>Recital 25**</td>
<td>The provisions on grid forming capability should only apply to new PGM and can create distortions between Member States. The stakeholder proposes to mandate ENTSO-E to present a proposal for synthetic inertia requirements for all synchronous areas.</td>
<td>Partly agree</td>
<td>According to Article 4 existing power generating modules are not subject to the requirements of the NC RfG. However, the exceptions provided in Article 4 should not be put into question by adding the word “new” to the recitals.</td>
</tr>
<tr>
<td>EDP</td>
<td>Article Y(8)(d)</td>
<td>The stakeholder proposes to explicitly provide that the activation or deactivation of the grid forming mode could be done remotely.</td>
<td>Disagree</td>
<td>Obliging PPM owners to provide two modes of operation, grid forming mode and grid following mode, would significantly increase the design and hence the manufacturing costs and the compliance procedures and hence the certification costs. Furthermore, factual uncertainty could lead to an abundant use of the deactivation option which could in hindsight prove to be a redundant use of that tool. The latter would put at risk the availability of an effective and reliable amount of grid forming PPMs.</td>
</tr>
<tr>
<td>EDP</td>
<td>Article 21(4)(a)</td>
<td>The stakeholders argue that the provision is not coherent with Recital 16 and can create distortions between Member States. The stakeholder proposes to mandate ENTSO-E to present a proposal for synthetic inertia requirements for all synchronous areas.</td>
<td>Disagree</td>
<td>The differing situations in the Member State demand that the NC RfG provides only for non-exhaustive requirements. The determination of precise technical details must therefore be left to the approval procedure under Article 7 NC RfG by which grid forming requirements will be specified by the designated entities of each Member State.</td>
</tr>
<tr>
<td>E-REDES</td>
<td>Article Y(8)(d)</td>
<td>The stakeholder proposes to explicitly provide that the activation or deactivation of the grid forming mode could be done remotely.</td>
<td>Disagree</td>
<td>Obliging PPM owners to provide two modes of operation, grid forming mode and grid following mode, would significantly increase the design and hence the manufacturing costs and the compliance procedures and hence the certification costs. Furthermore, factual uncertainty could lead to an abundant use of the deactivation option which could in hindsight prove to be a redundant use of that tool. The latter would put at risk the availability of an effective and reliable amount of grid forming PPMs.</td>
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<td>E-REDES</td>
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<td>The stakeholder argues that the provision is not coherent with Recital 16 and can create distortions between Member States. The stakeholder proposes to mandate ENTSO-E to present a proposal for synthetic inertia requirements for all synchronous areas.</td>
<td>Disagree</td>
<td>The differing situations in the Member State demand that the NC RfG provides only for non-exhaustive requirements. The determination of precise technical details must therefore be left to the approval procedure under Article 7 NC RfG by which grid forming requirements will be specified by the designated entities of each Member State.</td>
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<tr>
<td>NC RfG</td>
<td>Terna S.p.A.</td>
<td>Article Y(8)(d)</td>
<td>The stakeholder agrees with the mandatory/non mandatory application of grid forming capability by type to be nationally implemented, but considers it essential to maintain the functionality to activate and deactivate the grid forming capability (also remotely) as a grid connection requirement, so that the new power plants will be set up to be able to activate step by step the functionality in the future, where and when the grid will be adapted to manage the functionality.</td>
<td>Disagree</td>
</tr>
<tr>
<td></td>
<td>VDE FNN</td>
<td>Article 20(2)</td>
<td>The stakeholder does not agree with the deletion of the paragraph, as it needs to be maintained in particular for grid following PPMs.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Energinet</td>
<td>Article 20(4)</td>
<td>The stakeholder argues that the provision of a small share of symmetrical inertia is vital for the stable operation of a grid forming power park module. This is valid during normal operation in terms of small signal stability as well as for large disturbances after which the following transient of the frequency requires this small share of symmetrical inertia to reach and hold a new stable operating point. Especially the transition from an operating point within the frequency range of 50 Hz ± Δf1 to an operating point outside that region requires the initial grid forming behaviour, which particularly requires a small share of symmetrical inertia. The stakeholder therefore proposes to add the following provision: &quot;The relevant TSO in coordination with the relevant system operator may specify the symmetric contribution to synthetic inertia during normal operation in the frequency range of 50Hz ± Δf1. For the provision of additional energy above the inherent energy storage for this purpose, the relevant TSO may apply to the regulatory authority for the right to require the provision of additional energy beyond the inherent energy storage in coordination with the relevant system operator.&quot; This section only refers to voltage control and cannot be used to influence synthetic inertia. The sentence taken from the original ENTSO-E proposal does not fit the ACPPM proposal.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Energinet</td>
<td>Article 20(2)(b) and (c)</td>
<td>The stakeholder proposes not to delete the provisions, arguing that there will continue to be a need for the provision of fast fault current from grid following inverters.</td>
<td>Agree</td>
</tr>
</tbody>
</table>

Obliging PPM owners to provide two modes of operation, grid forming mode and grid following mode, would significantly increase the design and hence the manufacturing costs and the compliance procedures and hence the certification costs. Furthermore, factual uncertainty could lead to an abundant use of the deactivation option which could in hindsight prove to be a redundant use of that tool. The latter would put at risk the availability of an effective and reliable amount of grid forming PPMs.

Article 20(4)(a) already determines that the contribution to synthetic inertia is to be specified, even so in a mandatory manner. The proposed amendment would render a specific part of that contribution, namely the symmetric contribution to synthetic inertia during normal operation to a non-mandatory path. The provision of a small share of symmetrical inertia is indeed needed for the stable operation of a grid forming power park module. However, the NC RfG should not pre-empt the technological path to achieve that objective. Article 20(4)(a) in conjunction with Article 7 allows for flexible solutions considering possible alternative solutions, be it additional energy above the inherent energy storage or other means.

Fast fault current requirements are only redundant for grid forming PPMs, not for grid following PPMs.
### WEATHER HAZARDS RESILIENCE

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<tr>
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<tr>
<td>NC RfG</td>
<td>Finnish Energy</td>
<td>Recital (<strong>3)</strong></td>
<td>The stakeholder argues that any requirements that are derived from this text should never realise into blanket obligations that affect every Member State.</td>
<td>Disagree</td>
<td>Recitals do not impose legal obligations. The legally binding obligations are provided in the Articles of the Regulation.</td>
</tr>
<tr>
<td>NC RfG</td>
<td>EDF</td>
<td>Recital (22)(**)</td>
<td>The stakeholder proposes to add a sentence to the end of this paragraph stating that these points are to be addressed at the appropriate European and national level, and not in this NC RfG.</td>
<td>Partly agree</td>
<td>A cost-benefit analysis will be undertaken in accordance with Article 39 and power-generating facility owners and DSOs including CDSOs shall assist and contribute.</td>
</tr>
<tr>
<td>NC RfG</td>
<td>EUTurbines</td>
<td>Article 13(13)</td>
<td>As regards weather-related hazards, the stakeholder argues that those requirements shall reflect the specificities of generation technologies as discussed involving manufacturers.</td>
<td>Partly agree</td>
<td>A cost-benefit analysis will be undertaken in accordance with Article 39 and power-generating facility owners and DSOs including CDSOs shall assist and contribute.</td>
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## ACTIVE CUSTOMERS AND ENERGY COMMUNITIES

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<tr>
<td>NC RfG and NC DC</td>
<td>ENTSO-E, Terna Spa, VGBE, Eurelectric, EDF, Enel Group</td>
<td>Recital (**), Recital (10), New recital after recital (27) (NC RfG), New paragraph after Article 2(75), Article 3(2)(b) (NC DC)</td>
<td>The stakeholders argue that a fully autonomous energy island is not clearly defined in Regulation (EU) 2019/943 and can therefore be confused with other concepts. One stakeholder proposes to replace “fully autonomous energy island” by “off-grid system” and to define the latter in the definitions section. Finally, the term “citizen energy community” is defined in Directive (EU) 2019/944 but not in Regulation (EU) 2019/943. Fully autonomous energy community shall not be allowed to join the main continental Europe synchronous network if it does not comply with the NC RfG. One stakeholder supports ENTSO-E’s position that a new recital should be added to avoid unjustified limitations in technical capabilities of PGMs.</td>
<td>Agree</td>
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### UNITS PROVIDING DEMAND RESPONSE SERVICES

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<td>Response refers to:</td>
<td>Name of stakeholder(s)</td>
<td>Reference to Article(s) / paragraph(s) corresponding to ACER's draft NC proposed amendments</td>
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<tr>
<td>NC DC</td>
<td>IFIEC, Energie-Nederland</td>
<td>Recital (7), Recital (8) and other relevant articles</td>
<td>The stakeholders argue that while it is important that demand facilities can provide demand response services to system operators and relevant TSOs and while many (industrial) demand facilities are already doing so, these requirements should not be tackled via NC DC but rather be specified in the product requirements of the specific products of these system operators. This would allow much faster modifications if needs and/or capabilities change and would also avoid that facilities would not deliver some demand response service for which they have capabilities because they would not be able to fulfill (without costly investments) all requirements of the NC DC.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC DC</td>
<td>Energie-Nederland</td>
<td>Article 2(19)</td>
<td>The stakeholder considers that the definition of &quot;demand aggregation&quot; does not need to be defined in NC DC as there no need to mention aggregators or any other market role in the connection codes and the connection codes should only deal with connection requirements for assets. The extent to which a certain customer is active on the market and through with arrangement, should not be relevant for connection requirements.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC DC</td>
<td>IFIEC</td>
<td>Article 4a(2), Article 31, Article 32, Article 33, Article 34</td>
<td>The stakeholder proposes to specify in multiple articles that demand units providing demand response services &quot;to relevant system operators and relevant TSOs&quot;. The stakeholder also suggests to replace &quot;can&quot; with &quot;will&quot; in Article 4a(2)(c) where it is provided that &quot;in the case of a demand unit that can be used by a demand facility or closed distribution system to provide demand response services&quot;, arguing that potentially this is every demand unit, hence too large as a scope.</td>
<td>Partly agree</td>
</tr>
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</table>
## 14. IMPROVEMENTS TO THE APPLICABLE RULES AND PROCEDURES

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<td>NC RfG</td>
<td>ENTSO-E</td>
<td>Recital (s1)</td>
<td>The stakeholder proposes to add that 'in coordination with the relevant TSO' the relevant system operator may define the technical requirements that apply in the case of electrical equipment such as synchronous compensators, flywheels and regenerative braking systems which do not fall into the definition of a power generating module or electricity storage module.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>COGEN Europe, EU Turbines, WindEurope, Enercon</td>
<td>Recital (s1), Article 2(19), Article 6</td>
<td>Stakeholders propose to add that 'in the case of synchronous compensator and flywheels, the relevant TSOs in cooperation with stakeholders and eventually involving relevant European standardisation, shall define harmonised proposal for technical requirements within 1 year from the entry into force of this regulation. The harmonised technical requirements shall be introduced within 2 years from the entry into force of this regulation'. Another stakeholder proposes to add that: 'If synchronous compensator can provide active power, then NC RfG requirements may apply unless differently defined in national regulation'. Amendment to the definition of synchronous compensation operation is proposed to include a PGU that is not generating active power, to provide inertia to the system and to provide short circuit contribution to the system. A provision in Article 7 is proposed about requirements for synchronous compensator and eventually associated flywheels to be defined by TSOs and RSOs, in coordination with manufacturers.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>CENELEC, COGEN Europe, EUTurbines, Gunnar Kaasfe</td>
<td>Recital (3), Recital (**), Article 1</td>
<td>Some stakeholders propose to add that a major need for harmonisation is the EU-wide trade of components for power generating modules. Some other stakeholders propose that the harmonisation of the rules should also favour the union wide trade of these products and that appropriate countermeasures should be deployed by system operators.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Gunnar Kaasfe</td>
<td>Recital (2), Recital (3), Recital (18), Recital (21), Recital (22), Recital (24), Recital (26)</td>
<td>The stakeholder proposes amendments regarding the possibility to have also rules which discriminate between different technologies and to use European standardisation for harmonisation of grid connection. Also, to remove the reference to RES and reduce the 250 ms upper limit to a reasonable value of maximum fault clearing time a synchronous generator must cope with for FRT. It is suggested to use the principal of state observers, include different versions of digital and analogue communication channels and that the capabilities should take into account the voltage level of the point of connection in regard to possible cross-border issues.</td>
<td>Partially agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>EDP, Eurelectric</td>
<td>Recital (3)</td>
<td>The stakeholders propose to specify whether this concerns front of the meter storage only, or also behind the meter in a consumer (for instance, an industrial site with a battery installed).</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>WindEurope, Iberdrola, Enercon</td>
<td>Recital (6), Recital (**4)</td>
<td>The stakeholders argue that transition from traditional power system dominated by synchronous generators to very high shares of power park modules in the future leads to the need of additional ancillary services, which so far had not been thought of. Such additional system needs and the ways to satisfy them have to be assessed and organised by the regulator. Neither power facility owners, nor TSOs or DSOs can make that. The system needs and the ways to satisfy them have to be identified, defined, introduced, given a commercial value, and at the end procured. The obligation to trigger thinking and acting about this is in EU Directive 2019/944 of 5 June 2019 under the term &quot;non-frequency ancillary service&quot;. The stakeholders finally argue that the regulator should consider if advanced capabilities are to be provided as ancillary services in accordance with EU Directive 2019/944 of 5 June 2019, justified based on a publicly consulted CBA.</td>
<td>Disagree</td>
</tr>
</tbody>
</table>

*Procurement of ancillary services is out of scope of NC RfG. Recitals do not contain legally binding provisions.*
<table>
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<tr>
<td>NC RIG</td>
<td>Better Energy</td>
<td>Recital (24)</td>
<td>The stakeholder considers that reactive power capabilities should be assessed based on the maximum capacity in the connection point and suggests making this addition to this recital. The stakeholder considers that reactive power capabilities introduce higher investment costs as electrical equipment must be oversized to comply with the requirements.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Bundesverband Solarwirtschaft e.V., Solar Power Europe</td>
<td>Recital (27)</td>
<td>The stakeholder considers that European standardisation and harmonisation are crucial for a cost-effective energy transition. The stakeholders propose to replace ‘should’ with ‘shall’ in this paragraph.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Gunnar Kaestle</td>
<td>Article 2</td>
<td>The stakeholder proposes amendments to various definitions.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>WindEurope, Enercon</td>
<td>Article 2(35)</td>
<td>The stakeholder proposes that the proposal for requirements of general application, or the methodology used to calculate or establish them submitted by the relevant system operator or TSO should take into account agreed European standards and technical specifications as per Article 7(3)(i) of the NC RIG. The current reference is deemed sufficient for promoting further harmonisation through the European standards. Further, recitals do not contain legally binding provisions.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>WindEurope, Enercon</td>
<td>Article 2(48), Article 2(55)</td>
<td>The stakeholders argue that feedback is not the right term. It should usually be &quot;closed-loop&quot;. However, if its closed-loop or open-loop is not relevant here. As &quot;alternator&quot; is the term used for the classic synchronous generator, it should be also for consistency. As far as possible already existing definitions shall be used: (29).</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>WindEurope, Enercon</td>
<td>Article 2(63)</td>
<td>The stakeholders propose to add “allowing to energize its power-generating facility” at the end of the definition.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>CENELEC</td>
<td>Article 2(7)</td>
<td>The stakeholder proposes that the responsible legal entity of a power-generating facility should be the “operator” in the NC RIG documents and not the owner.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>CENELEC, EU Turbines, Enel Group</td>
<td>Article 2(68)</td>
<td>The stakeholder proposes to replace ‘less any demand or losses’ with ‘including any demand or losses’ or include the word controllable.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Undisclosed stakeholder</td>
<td>Article 2(68)</td>
<td>The stakeholder suggests changing the words to ‘maximum power consumption’.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Bundesverband Solarwirtschaft e.V., VDMA e.V., WindEurope, Iberdrola, ÆEE</td>
<td>Article 7(4)</td>
<td>One stakeholder proposes that the last sentence of paragraph (4) (i) is deleted, since shorter time periods than two years (with no limit as to how short) to implement new requirements would impose difficulties on market participants. For the development of products to be distributed within the EU’s internal market it is helpful to have the same timeline in each Member State. One stakeholder argues that regarding the provision that the Member State may provide for a shorter time period, it must be considered with all stakeholders and with respect to the best economic solution. There must be serious reasons here (e.g. critical grid stability). Another stakeholder proposes to increase the deadline for approval to three years. Two stakeholders propose that the proposal for requirements of general application, and the methodology used to calculate or establish them should be submitted.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>VDMA e.V.</td>
<td>Article 13(2)(b)(i)</td>
<td>The stakeholder proposes to specify conditions and requirements if stable operation implies a specific reaction in dynamic conditions.</td>
<td>Disagree</td>
</tr>
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<tr>
<td>NC RfG</td>
<td>Undisclosed stakeholder</td>
<td>Article 13(2)(b)(i)</td>
<td>The stakeholder proposes to add the following text: “which means that a PGM can re-establish a connection and active power after a loss of connection; this does not include V2G EVs connected to an V2G EVSE.”</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Gunner KAESTLE</td>
<td>Article 13(2)</td>
<td>The stakeholder proposes that the text in Figure 1 about the Pref needs to be revised in such a sense that Pref should be the default value for both PPMs and synchronous PGMs.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Doosan Škoda Power a.s</td>
<td>Article 13(3)(g)(i)</td>
<td>As regards the response time of SPGMs when operating during LFSM-O mode, the stakeholder proposes to include that active power decrease events should be limited throughout SPGM lifetime as it is obvious such power change might influence lifetime of the turbine. The stakeholder argues that it cannot be generally accepted that all turbines can do such big change of power within so short time while continuing in operation without impacting its lifetime. Any longer time for 45% power reduction would be beneficial for plant stress reduction.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>RES Group</td>
<td>Article 13</td>
<td>The stakeholder states that Article 13(3)(c) says &quot;The frequency threshold shall be 50Hz±Δf1&quot;, but should be 50Hz±Δf2 for LFSM-U. Seems like a copy/paste error from LFSM-O, and that Article 13(3)(g) refers to an undefined acronym &quot;RSO&quot; which should be relevant system operator Article 13(3)(g) refers to “...}. Resp in Figure XX, for active power decrease...&quot; however this figure XX illustrates active power increase. The subscripts in Figure 1 are practically illegible.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>WindEurope, Enercon</td>
<td>Article 13(3), Article 15(2)</td>
<td>The stakeholders propose amendments to the article such as referencing the paragraph about droop settings, change block in real time LFSM-O to activate/deactivate without unintentional delay and allow the relevant system operator to determine more relaxed time responses.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Eurelectric</td>
<td>Article 14(2)</td>
<td>As regards the phrase 'the TSO may specify shorter periods of time...' the stakeholder argues that this could risk having too stringent and also divergent requirements across Europe.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>WindEurope, Enercon</td>
<td>Article 14(2)</td>
<td>The stakeholder proposes amendments to the article such as removing requirements for Spain, and that wider voltage ranges shall not overlap the ranges for FRT.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Doosan Škoda Power a.s, VGB, EUROPGEN, EUTurbines, Swedenergy, WindEurope, Enercon, Moeller Operating Engineering GmbH, VDE FNN</td>
<td>Article 15(2)(c)(i)</td>
<td>The stakeholders argue that the frequency threshold shall be 50Hz±Δf1 instead of 50Hz±Δ2 as the provision is about LFSM-U.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Doosan Škoda Power a.s</td>
<td>Article 15(2)(d)</td>
<td>The stakeholder proposes changes to Figure 5 to illustrate the case of non-zero deadband and insensitivity and additional text to prescribe the calculation of the change in active power output.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Doosan Škoda Power a.s</td>
<td>Article 15(2)(d)(ii)</td>
<td>The stakeholder proposes to change the maximum admissible choice of full activation time in Table 5 for SA Ireland and Northern Ireland from 5 sec to 15 sec.</td>
<td>Disagree</td>
</tr>
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<tr>
<td>NC RIG</td>
<td>COGEN Europe, WindEurope, Enercon</td>
<td>Article 15(2)(d)</td>
<td>The stakeholders propose changes to various parts of the article, such as using droop requirement of 2% in table 4 only for ESMs, replace frequency response dead band for FSM with frequency response insensitivity for FSM, replacing for PGMs without inertia with ESMs and removing FSM from table 4.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Enercon</td>
<td>Article 15(2)(d)</td>
<td>The stakeholder proposes to add new point (y), providing that for PPM with volatile primary power source the combined effect of frequency response insensitivity and frequency response deadband shall not be smaller than 20 mHz.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>EDF</td>
<td>Article 15(2)</td>
<td>The stakeholder considers that the point about LFSM-U in Article 15(2)(c)(ii) does not seem justified and that it should be erased. The stakeholder argues that new requirements should be duly justified for any type of grid user, based on a need clearly identified by TSOs in all transparency. The stakeholder regrets the lack of solid justifications and of cost-benefit analyses to justify new requirements. The former formulation in RIG v1 about 15(2)(d) was quite relevant and should be kept. The new proposal with several added information makes the reading unclear. As regards Article 15(2)(d)(iv), the stakeholder argues that the wording “shall be as short as feasible” is too vague, and extensive, which may lead to technical debates. As regards table 4 in Article 5(2)(d)(i), insensitivity is reduced from 30 mHz to 15 mHz. The stakeholder argues that new requirements should be duly justified for any type of grid user, based on a need clearly identified by TSOs in all transparency. The stakeholder regrets the lack of solid justifications and of cost-benefit analyses to justify this requirement and request its removal. As regards Article 15(2)(d)(ii), the stakeholder argues that in LFSM-U mode, an electricity storage module shall be able to increase its generation, if possible, or to decrease its consumption and switch to generation, but in no case, to switch from generation to consumption. The wording should be modified as proposed.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>EDF</td>
<td>Article 15(4)</td>
<td>As regards Article 15(4)(b)(vii), the stakeholder requests for some clarification on what is expected from PGMs for their operation between 0 and their Minimal Operating Point and how long, in which conditions. The stakeholder argues that the reference mentioned in Article 15(4)(b)(iv) is invalid.</td>
<td>Article 15(4)(b)(vii) of the NC RIG provides that the minimum operation time shall be specified by the relevant TSO, taking into consideration the specific characteristics of prime mover technology. The references in Article 15(4)(b)(iv) refer to LFSM-U mode.</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Doosan Škoda Power a.s.</td>
<td>Article 15(4)(b)(iii)</td>
<td>The stakeholder proposes to clarify that, with regard to the capability to take part in island operation, if the island mode signal is not received from the TSO, it should be ensured by other means that AVR of SPGM is operating in voltage control mode with no superimposed regulation of reactive power nor power factor. The stakeholder argues that if the island mode is not signalled to the PGM and generator AVR is in reactive power control or power factor control, the voltage control might not be working well.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Eurelectric, EDF</td>
<td>Article X(1)</td>
<td>The stakeholder requests what is the justification for 0.85 pu and argues that the 0.9 value regarding voltage FRT capability had been discussed during a long time, but not this new value, which may trigger technical problems.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Energie-Nederland</td>
<td>Article X(1)</td>
<td>The stakeholder argues that ACER/ENTSO-E should specify whether FRT is required for type A SPGMs in order to facilitate the level playing field.</td>
<td>Disagree</td>
</tr>
</tbody>
</table>
### Summary of respondents’ response

The stakeholders propose amendments to the capability of a PGM to be equipped with a communication interface and to the module that it shall have the capability to support the system. The stakeholders propose to exclude small micro CHP generators up to 50 kW from certain technical requirements in Articles 13 and 14. The stakeholders propose to specify the interface for the external signal. In considering project specific design conditions and keeping stable power to evaluate frequencies lower than 0.2Hz from the measurement with band limited noise signal and the contribution to power damping of generators at such low frequency is negligible and accuracy of evaluation is questionable. Other stakeholders propose that the PSS of the PGM shall have the capability to damp inter-area power oscillations in the frequency range of, at least, 0.2 Hz – 1.0 Hz, instead of 0.1Hz-1.0Hz. The stakeholder argues that from practical point, the lower limit should be rather 0.2Hz, as it is more demanding on test duration and keeping stable power to evaluate frequencies lower than 0.2Hz from the measurement with band limited noise signal and the contribution to power damping of generators at such low frequency is negligible and accuracy of evaluation is questionable. Other stakeholders propose that the PSS of the PGM shall have the capability to damp inter-area power oscillations in the frequency range of, at least, 0.3 Hz – 1.0 Hz, instead of 0.3Hz-1.0Hz.

### ACER views

- **Doosan Škoda Power a.s.**
  - **Article 19(2)(a)(iii)**: The stakeholder proposes that the PSS of the type D PGMs due to the need to simplify the provisions that should be covered by an agreement between the power-generating facility owner and the relevant system operator, in coordination with the relevant TSO. ACER considers that the current wording adequately describes these capabilities. However, ACER has amended the wording regarding the circuit breaker in a way that is technology neutral.
  - **Article 19(2)(b)(ii)**: The stakeholder proposes to replace the phrase ‘bandwidth limitation of the output signal’ with ‘bandwidth limitation of the generator excitation system loop in relation to the influence to stator voltage and active power’ as bandwidth limitation would not just limit the periodic output, but also the steep of AVR voltage output. In addition, if bandwidth limitation is required from TSO, it should be ensured by proper tuning of PSS, main filters and R-T filter and studying of sensitivity of the system to frequencies of interest.

- **COGEN Europe**
  - **Article 19(2)(b)(iii)**: The stakeholder suggests removing the requirement for a stator current limiter. They argue that it is not necessarily needed, there is already the overexcitation limiter (OEL) that is limiting the permissible current on the stator based on thermal limits. OEL is defined on rotor thermal limit which is normally conservative compared to stator thermal limit.

- **VDE FNN**
  - **Article 19(3)**: The stakeholder considers that many power generating facilities are connected to the distribution network (110 kV). Therefore, the TSO should set the parameters, but any agreement or contract with the facility owner should be made by the relevant system operator.

- **Swedenergy, Energie-Nederland**
  - **Article 19(4)**: The stakeholders propose to delete Article 19(4), since it is referring to Article 13(2)(b), which is excluded for type D according to Article 19(1).

- **WindEurope**
  - **Article 27**: As regards quick re-synchronisation capability, the stakeholders suggest that the relevant system operator in coordination with the relevant TSO and the power-generating facility owner could agree on a larger time limit than 15 minutes considering project specific design conditions.

- **VDMA e.V., CEGELEC, COGEN Europe, EUGINE, EUROPGEN, EUThermal**
  - **Article 13(3)(g), Article 13(7), Article 14(5)(d), Article 15(2)(c)(vi)**: Some stakeholders propose to specify the interface for the external signal. In addition, some stakeholders propose to differentiate the response time per class of technology.

- **Eurelectric**
  - **Article 15(2)(c)**: The stakeholder suggests erasing the point about LFSM-U in Article 15(2)(c) as it does not seem justified.

- **COGEN Europe, EUThermal**
  - **Article 13(3)(h), Article 13(7), Article 13(8)**: The stakeholder proposes amendments to the capability of an electricity storage module to activate the provision of active power frequency response, to the capability of a PGM to be equipped with a communication interface and to the capability to connect to the network.

- **VDMA e.V., CEGELEC, COGEN Europe**
  - **Article 13**: The stakeholders propose to exclude small micro CHP generators up to 50 kW from certain technical requirements in Articles 13 and 14.

- **Undisclosed stakeholder**
  - **Articles 14, 17, 20, 31 and 32**: The stakeholder proposes to delete type B PGMs due to the need to simplify the determination of significance of PGMs.
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<tr>
<td>NC RfG</td>
<td>COGEN Europe, EUROPGEN, EU Turbines</td>
<td>Article 14(1)(a)</td>
<td>Some stakeholders propose to reduce the number of protection modules that may be required by the relevant system operator as some of these functions might not be applicable for type D units. In addition, provisions for data exchange for fault events are proposed. Some other stakeholders propose to change the quality of supply and dynamic system behaviour monitoring to fault recording.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>EDF</td>
<td>Article 14(4) (new provision), Article 20(2)(a)</td>
<td>The stakeholder proposes to add new paragraph 4 to Article 17 to provide for the relevant system operator to have the right to send reactive power setpoints to the generation station. These setpoints shall be executed by the generation station. The stakeholders propose the same right to be included in Article 20(2)(a), in order to achieve an optimised reactive power flow in the network, as reactive power flows can vary daily, seasonally and from network to network.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>VDMA e.V., ENTSO-E, undisclosed stakeholder, Oesterreichs Energie</td>
<td>Article 13a(2)</td>
<td>The stakeholders propose to define the cyber protection for the data exchange interface. They also propose to use a more generic definition, such as “communication interface”.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>E-REDES, Eurelectric</td>
<td>Article 17(4) (new provision), Article 20(2)(a)</td>
<td>The stakeholder proposes to add new points (i) and (j), providing that the “(i) power generating modules shall be capable of activating this provision with a power decrease response time as specified by the relevant system operator, in coordination with the relevant TSO, but always limited by the capabilities inherent to the power generating technology” and “(j) the increasing and decreasing active power ramp rate shall consider the technical constraints of power generating module technologies as defined in Table X: Maximum active power ramp rates for various technologies”. The stakeholder also suggests providing that if the active power change is greater than the given limit, the response time for the part of the active power change exceeding the given limit shall be as fast as possible. The power-generating facility owner shall justify the response time, providing technical evidence to the relevant TSO.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>KCORC</td>
<td>Article 13(9)</td>
<td>The stakeholders notes that due to the reference to Article 13(7) which is excluded for type D, it is difficult to have Article 13(9) to be valid for type D. Additionally, the requirement for type D concerning connection/synchronisation is in Article 16(4) for type D. Considering that, it is suggested to provide in Article 19(1) that also Article 13(9) is excluded from application for type D.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Swedenergy</td>
<td>Article 14(2), Article 14a(2) (NC RfG)</td>
<td>The stakeholder considers that 1 pu should be defined more clearly. In Finland, 110 kV network is generally operated at 118 kV. It was inquired whether 1 pu is the nominal or normal voltage. The stakeholder argues that this may have significant outcomes regarding, for example, the voltage withstand capabilities of network equipment if 1 pu is 118 kV. It was requested to double-check this with the Finnish TSO Fingrid. The stakeholder also argues that the short measurement window of frequency should be reviewed thoroughly, especially for smallest demand units.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG and NC DC</td>
<td>Finnish Energy</td>
<td>Article XX, Annex II (NC DC)</td>
<td>The stakeholder considers that 1 pu should be defined more clearly. In Finland, 110 kV network is generally operated at 118 kV. It was inquired whether 1 pu is the nominal or normal voltage. The stakeholder notes that there may have significant outcomes regarding, for example, the voltage withstand capabilities of network equipment if 1 pu is 118 kV. It was requested to double-check this with the Finnish TSO Fingrid. The stakeholder also argues that the short measurement window of frequency should be reviewed thoroughly, especially for smallest demand units.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>ACER</td>
<td>Article 14(3)</td>
<td>The stakeholder argues that there is an inconsistency in Article 14(3)(ii)(a), it is unapplicable to type D machines. It looks like there is a lag in the references in this ACER’s proposal due to the fact that some articles were suppressed compared to the initial NC RfG version.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>SO GL</td>
<td>Article 14(3)</td>
<td>The stakeholder argues that due to the increasing and decreasing active power ramp rate shall consider the technical constraints of power generating module technologies as defined in Table X: Maximum active power ramp rates for various technologies”. The stakeholder also suggests providing that if the active power change is greater than the given limit, the response time for the part of the active power change exceeding the given limit shall be as fast as possible. The power-generating facility owner shall justify the response time, providing technical evidence to the relevant TSO.</td>
<td>Disagree</td>
</tr>
</tbody>
</table>

The flexibility for the relevant system operator to decide on the necessary protection scheme aspects based on their network and the available generation fleet should be retained. In any case, there is no obligation that all protection scheme aspects should be covered. According to Article 14(5)(d)(v) of the NC RfG settings of the fault recording equipment and the communications protocols for quality of supply and dynamic system behaviour monitoring shall be agreed between the power-generating facility owner and the relevant system operator in coordination with the relevant TSO.

For type D PGMs, Article 15(5)(b)(ii) applies. These are provisions that exist in the current NC RfG.

As the Network Code on Cybersecurity will apply to data exchange per se, the grid connection network codes do not need to include any specific definition. The Network Code on Cybersecurity will define its own scope.

ACER agrees with the proposal that the power generating module shall be able to receive and react to an external signal allowing the relevant system operator to transmit reactive power or voltage control mode set points. However, it would be beneficial to the system and for the potential increase of distributed generation to allow such requirement for type A as well.

The specific provisions for LFSM-O adequately describe the response time for active power decrease in case of increasing frequency for SPGMs and PPMs. The provision also covers the option for slower response.

The incorrect reference to Article 13(7) was changed to Article 13(8).
### Applicable NC

<table>
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<tr>
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<tr>
<td>NC RIG</td>
<td>Swedenergy</td>
<td>Article 14(2)</td>
<td>The stakeholder considers that use of &quot;rated voltage&quot; in Article 14(2)(i) is incorrect and it needs to be changed to &quot;nominal voltage&quot;.</td>
<td>Partly agree</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>It was also argued with regard to point (iv), that the fixed reference value for 400kV level is not optimal to some synchronous areas from a system perspective with all PGMs designed to a historically different reference value. It was proposed to allow, within the synchronous area, to choose the best reference value for the system stability and security perspective.</td>
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<td></td>
<td></td>
<td></td>
<td>As for Table XX, 0.85 to 0.90 p.u. is an added voltage range for Nordic area. The stakeholder argues that this requirement drives the plant designs towards the use of OLTC for transformers connected between plant and grid. This has not been the praxis for the Nordic power system in history until now and enhances. New models of failure to the system.</td>
<td></td>
</tr>
<tr>
<td>NC RIG</td>
<td>Enel Group</td>
<td>Article 13(3), Article 14(2), Article 14(3),</td>
<td>The stakeholder proposes to enforce the role of DSO in points (g) of Article 13(3), (i) and (vi) of Article 14(2), (iv) of Article 14(3). The stakeholder also suggests providing regarding Table XX.1 and XX.2 that the maximum high voltage value shall be coordinated with the relevant IEC standards for the equipment manufacturing and testing.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Mcoller Operating Engineering GmbH, VDE FINN, Swedenergy</td>
<td>Article 14(3)</td>
<td>The stakeholder proposes rephrase the paragraph so as to read &quot;longer&quot; times or &quot;higher and longer times&quot;.</td>
<td>Agree</td>
</tr>
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<td></td>
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<td></td>
<td>As regards Figure X &quot;High voltage ride-through profile of a power-generating module&quot;, the stakeholder suggests the addition of the sentence: The diagram represents the higher limit of a voltage-against-time profile of the voltage at the connection point, expressed as the ratio of its actual value and its reference 1 pu value, before, during and after a fault. Uref is the maximum voltage specified in paragraph 2.</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>The stakeholder requests what is the voltage level before the beginning of the over-voltage profile. (Uref? 1 pu?)</td>
<td></td>
</tr>
<tr>
<td>NC RIG</td>
<td>EDF</td>
<td>Article 14(3)</td>
<td>The stakeholder proposes to exclude the requirement in Article 14(3)(a)(iv) for type D and only leave the requirement in Article 16(3)(b), arguing that since the text is the same it might cause issues if either of them will be amended in the future.</td>
<td>Partly agree</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>As regards point (c), the stakeholder suggests that the plan owner needs to be a part of the process if higher ranges than in Figure X shall be designed for. This cannot be decided only by SOs/TSOs.</td>
<td></td>
</tr>
<tr>
<td>NC RIG</td>
<td>Swedenergy</td>
<td>Article 14(3)</td>
<td>The stakeholder proposes to add in point (i) that the lower limit shall be specified by the relevant TSO using parameters in Figure 3 &quot;or in harmonised standards if more stringent&quot;, arguing that each relevant system operator is already able to make publicly available the pre-fault and post-fault conditions for the fault-ride-through capability.</td>
<td>Partly agree</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Article 16(3)(a) apply to type D PGMs. The technical and economic feasibility of the PGM should be taken into account when applying longer times for operation.</td>
<td></td>
</tr>
<tr>
<td>NC RIG</td>
<td>Enel Group</td>
<td>Article 14(3)</td>
<td>The stakeholder proposes to compliment that the voltage-against-time profile specified by the relevant TSO need to take the network topology for plant connection into consideration.</td>
<td>Disagree</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>The stakeholder suggests deleting the parenthesis in Table 7.1.2 as it is unclear and not specific on who has to justify the system protection and secure operation needs.</td>
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<td></td>
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<td>It was also proposed to provide in Article 16(3)(a) that the need to enlarge the time range above time limits set in Table 7.1.2 (up to 0.25 seconds) may be agreed with PGM owner, only if justified by the relevant TSO that there are system protection and secure operation needs.</td>
<td></td>
</tr>
<tr>
<td>NC RIG</td>
<td>WindEurope</td>
<td>Article 25(3)</td>
<td>The stakeholder proposes to add that requirements on the voltage ranges 0.86 to 0.9 as well as 1.1 to 1.15 pu. are only applicable when explicitly required by the TSO. Also, to include the 66kV voltage with the same ranges as 110 kV.</td>
<td>Disagree</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>The voltage ranges have been amended based on proposals from several stakeholders relating to the need to maintain sufficient levels of system robustness. Voltage levels for voltages below 110kV are specified by the relevant system operator.</td>
<td></td>
</tr>
</tbody>
</table>

ACER acknowledges the need to provide clarity regarding the use of "rated voltage". Relevant amendments have been introduced to the NC RIG. According to points (i) and (vi) of Article 14(2) of the NC RIG, it is for the relevant system operator in coordination with the relevant TSO to specify the voltage ranges. ACER considers that the current provisions are adequately described. The voltage ranges have been amended based on proposals from several stakeholders relating to the need to maintain sufficient levels of system robustness.
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<td>NC RfG</td>
<td>EU DSO, EDP, Eurelectric, E-REDES</td>
<td>Recital (18)</td>
<td>The stakeholders suggest that it is important to recognise that fault ride through is a requirement in relation to faults on the transmission system only. The stakeholders recommend that this distinction is made clear from the first opportunity in the NC RfG.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RfG and NC DC</td>
<td>CENELEC, Enel Group</td>
<td>New recitals, Article 7, Article 13, Article 47, Article 48, Article 54, Article 55 (NC RfG), Article 25, Article XX-2, Article XX+3, Article 35 (NC DC)</td>
<td>The stakeholders propose new recitals noting that technical specifications for interoperability of recharging and refuelling points and for grid connection should be specified in European or international standards.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>EDF</td>
<td>Article 2(17)</td>
<td>The stakeholder suggests an editorial modification in the definition of &quot;power park module&quot;, to add the words 'or to a' to the last sentence.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Bundesverband Kraft-Wärme-Kopplung e.V.</td>
<td>Article 2(17)</td>
<td>The stakeholders propose to either differentiate centrally by amending the definition, so that PPMs are only converter based generators (full convertors or DFIGs) or do not forget to check each requirement on PPM if there is an exception according to EN 50549 (for µCHP up to 50 kW, and asynchronous generators used for other microgenerators), see also in the report of the Expert Group on type A about the Expert Group on type A on the relevance to the power system of micro CHP. The stakeholder argues that the definition &quot;power park module or PPM means a unit or ensemble of units that can generate electricity, which is not a synchronous power generating module and which is either non-synchronously connected to the network or connected through power electronics, and that also has a single connection point to a transmission system, distribution system including closed distribution system or HVDC system&quot; cannot distinguish between asynchronous generators and converter based generators, although these two technology have different features and capabilities.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>AEE, WindEurope, Enercon</td>
<td>Article 2(22)</td>
<td>The stakeholders propose to reword the definition of frequency to be more precise than 50Hz or the NC RfG 2.0 text also addresses phenomena in the frequency range 0.2Hz up to 9kHz. The stakeholders consider that the interest of system stability is not acceptable that a key electrical value like frequency remains with such a blurry &quot;definition&quot;. In addition, one stakeholder proposes to include that the frequency is calculated based on the measurement of this physical quantity over a gliding 200 ms time window.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>WindEurope, Enercon</td>
<td>Article 2(24)</td>
<td>The stakeholders request to clarify difference to definition (50) and they pose the following questions: What for is a &quot;minimum regulating level&quot; if it is not &quot;stable&quot;? If there is a timely difference between (24) and (50) this must be quantified.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>WindEurope, Enercon</td>
<td>Article 2(29)</td>
<td>The stakeholders propose that the definition for fault ride-through includes the over voltage requirement.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Enercon</td>
<td>Article 2(33), Article 2(40), Article 2(62)</td>
<td>The stakeholder proposes amendments to the definitions.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Enercon</td>
<td>Article 2(69) and Article 2(70)</td>
<td>The stakeholder suggests that there should be consistency of terms and since the definition (67) mentions &quot;inject&quot; and &quot;consume&quot;, those shall be the terms for the two possible flow directions of power used throughout the document.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Bundesverband Solarwirtschaft e.V.</td>
<td>Article 2(76) (new)</td>
<td>The stakeholder proposes to introduce a definition of &quot;mixed customer sites&quot; as the combination of demand facility and a power-generating facility at a co-ordinated point.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG and NC DC</td>
<td>ENTSO-E</td>
<td>Article 7(4) (NC RfG), Article 6(4) (NC DC)</td>
<td>The stakeholder suggests that it should be possible to coordinate with the relevant TSO if it is feasible or if this shorter time is linked to system needs.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>CENELEC</td>
<td>Article 7</td>
<td>The stakeholder proposes to replace competent entity with designated entity.</td>
<td>Disagree</td>
</tr>
</tbody>
</table>

ACER agrees to clarify this in the recital. Relevant amendments have been introduced in the NC RfG.

Interoperability issues are out of scope of the NC RfG. Furthermore, recital (27) adequately describes the need to take into particular consideration established technical standards in the development of connection requirements. In addition, the current reference as per Article 7(3)(i) of NC RfG and Article 6(3)(ii) of the NC DC is considered to be sufficient for promoting further harmonisation through the European standards.

ACER considers that the already specified definition adequately describe the notion of maximum capacity.

The addition of "which is not a synchronous power generating module and" in the definition of PPM in the amendment proposal, aims to clarify that if a PGM does not fall within the definition of SPGM ("the frequency of the generated voltage, the generator speed and the frequency of network voltage are in a constant ratio and thus in synchronism") then it is considered to be a PPM. This clarifies also that DFIG and induction generators are PPMs.

The current definition of frequency is sufficient to define the term for the purposes of the NC RfG. Furthermore, measurement window can vary depending on the application.

The definitions are used for different requirements in the NC RfG. The current definitions are sufficient to define the terms for the purposes of the NC RfG.

It is important to note that the HVRT requirement is separate from requirement on FRT capability as overvoltage are not synchronized with voltage dip.

The definitions are the same as in the current NC RfG and they have been agreed with Member States. ACER does not see the necessity to change these definitions.

Relevant amendments have been introduced in the NC RfG.

In ACER’s view, PGM requirements should be the same irrespective of whether a plant is connected to a MCS or to the RSO’s network.

It is important that the Member State may provide for a shorter time. However, it is anticipated that the decision to provide shorter time period will involve the relevant TSO.

These two notions are not interchangeable.
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<td>NC RfG</td>
<td>CENELEC, EFAC, Enel Group</td>
<td>Article 13(3)(a)</td>
<td>The stakeholders propose to clarify that the frequency threshold is specified in para. (c) below and not by the TSO.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>CENELEC, VGBE</td>
<td>Article 13(9)</td>
<td>The stakeholder suggests that in case of small size PPMs the synchronisation is not done with circuit breakers. It should be stated in a way which is technology neutral to allow other suitable switch types.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>COGEN Europe, EUTurbines</td>
<td>Article 14(2)(a)</td>
<td>The stakeholders propose that voltage deviation should not be at PGU terminals. In addition, a requirement for simultaneous overvoltage and underfrequency is proposed.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>ENTSO-E</td>
<td>Recital (27)</td>
<td>The stakeholder proposes that European standardisation organisations should not be involved in the development of non-exhaustive requirements.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>VDE FNN</td>
<td>Recital (2)</td>
<td>The stakeholder suggests that national methodologies would contradict all efforts of achieving cost efficiencies on the side PPM constructors and operators, which are regarded as market integration issues by the standard below. The aim is to achieve international solutions.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>VGBE</td>
<td>Recital (27)</td>
<td>The stakeholder proposes that European standardisation organisations shall be involved in the development of non-exhaustive requirements.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Fingrid Oyj</td>
<td>Recital (27)</td>
<td>The stakeholder generally agrees on the component level but argues that the compliance of power plants as an entity has to be ensured. Consequently, proper design of the entire power plant to work as a whole has to be emphasised.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Finnish Energy</td>
<td>Recital (27)</td>
<td>The stakeholder generally agrees with the amendments but notes that the standardisation can take time and it does not make compromises to meet deadlines. If the standardisation process regarding these requirements is not already ongoing, it is a clear case for improvement in the drafting of future NCs.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>ENTSO-E, Terna Spa</td>
<td>Recital (27), Recital (28)</td>
<td>The stakeholders propose to add provisions for extended system support by PGMs beyond the frequency, voltage or reactive power capabilities, in the NC RfG. The stakeholder argues that these extended capabilities should not be withheld unjustifiably.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>ENTSO-E</td>
<td>Recital (32)</td>
<td>The stakeholder proposes that recital (32) should be part of the Article 70a.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>VGBE, Enercon</td>
<td>Article 2(9)</td>
<td>The stakeholder proposes an amendment to the definition of synchronous power-generating module.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Enercon</td>
<td>Article 2(10), Article 2(10a)</td>
<td>The stakeholder proposes to add that the compliance with the technical criteria is set out in the applicable national implementation of this Regulation, arguing that PGMD already exist in some countries, such as NL or DE. Key criteria for the PGMD are that specific non-exhaustive criteria from the RfG are met. A PGMD that is only based on the exhaustive criteria from RfG2.0 would help, it would especially not meet the expectations from the RSO. The stakeholders submitted the same comment in relation to “SED” definition.</td>
<td>Disagree</td>
</tr>
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</table>

Relevant amendments have been introduced in the NC RfG. ACER agrees with amending the wording in a way that is technology neutral. Relevant amendments have been introduced in the NC RfG. There is no obligation to involve European standardisation organisations to the development of non-exhaustive requirements as the recital refers to the extent possible. ACER underlines that a higher degree of harmonisation, benefiting the EU consumer, will be achieved if the development of the non-exhaustive requirements is carried out involving European standardisation organisations, which should already be the case. Harmonised rules for grid connection for power-generating modules should be set out in order to provide a clear legal framework for grid connections, facilitate Union-wide trade in electricity, ensure system security, facilitate the integration of renewable electricity sources, increase competition and allow more efficient use of the network and resources, for the benefit of consumers. However, it is also appropriate to consider regional specificities when establishing network connection rules. The NC RfG cannot impose such a requirement on the mentioned entities. Nevertheless, ACER understands that non-site specific and non-exhaustive requirements are in any way developed in coordination of European standardisation organisations. The NC RfG provides for technical requirements and demonstration of compliance rules for PGMs. The consideration of the EU International standards is prescribed uniformly for all PGMs in Article 7 while Recital (27) has been improved to ensure that “Development of non-exhaustive requirements should, to the extent possible, be carried involving European standardisation organisations; therefore, permitting the evolution of product standards and, as a consequence, the adoption of the same by the industry.” ACER understands the benefit of PGMs continuous system support and contribution to overall system robustness under system conditions beyond the frequency or voltage defined in the NC RfG. However, additional requirements can be included in the connection agreement, respecting their economic and technical feasibility. The recital provides context and background information to the provisions therefore it should remain. ACER included provisions in Article 71a to add legal certainty as to the application of Regulation (EU) 2016/631. The recital provides context and background information to the provisions therefore it should remain. ACER included provisions in Article 71a to add legal certainty as to the application of Regulation (EU) 2016/631. ACER considers that the proposed definition adequately describes the notion of SPGM. Definition (10) in the current NC RfG has been agreed with Member States. The document confirms that compliance of the power-generating module with the technical criteria set out in the NC RfG has been demonstrated. Definition (10a) is based on definition (10). ACER does not see a need to change it.
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<td>NC RIG</td>
<td>Enercon</td>
<td>Article 2(12)</td>
<td>The stakeholder proposes to add the wording at the end “which are not part of a power-generating factory”, arguing that it is key to define where “network” starts and ends. By clarifying this is not part of the PGF, hence in view of the power inflow from the PGF into the grid behind the connection point, it becomes clear.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>ENTSO-E, EU DSO, Oesterreichs Energie</td>
<td>Article 2(15), Article 2(16), Article 2(68)</td>
<td>One stakeholder proposes to clarify that the connection point is reflected only to an AC electrical interface. In addition, they propose to remove the phrase ‘by appropriate means’. One other stakeholder proposes to add where an agreement is not required by the relevant SO.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>EU DSO</td>
<td>Article 2(14), Article 2(16)</td>
<td>The stakeholder suggests that it should be made clear in the definitions of ‘Pmax’ and ‘connection agreement’ that ‘Pmax’ is distinct from the facility maximum import or export values at the connection point and ‘Pmax’ should take account of reactive current.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>COGEN Europe</td>
<td>Article 2(16)</td>
<td>The stakeholder proposes that Pmax shall be referred to specific ambient and operational condition.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>ENTSO-E</td>
<td>Article 2(69), Article 2(70), Article 2(71), Article 2(72)</td>
<td>The stakeholder proposes to replace grid with network. There is a clear use of the term network in the NC RIG.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>COGEN Europe</td>
<td>Article 2(44)</td>
<td>The stakeholder proposes changes to the definition as household can be also an intentional disconnection from the grid.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>VGBE, Cenelec, COGEN Europe, ETURBINES, Bundesverband Solarwirtschaft e.V., RWE AG, Solar Power Europe, CEZ, Eurelectric</td>
<td>Article 4(2)</td>
<td>Some stakeholders propose that a power-generating module should be considered existing if the power generating facility owner has concluded a final and binding contract for the purchase of the main generating plant by three years or even more as decided at national level by the NRA for specific technologies.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>E.ON</td>
<td>Article 4(2)</td>
<td>The stakeholder proposes to introduce the words ‘on the date of entry into force of the Regulation’ as it questioned whether the contract must be concluded at the time of entry into force and should only the delivery of the main components take place within the 2 years, or whether the contract only be concluded within the period.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>CEZ, Eurelectric</td>
<td>Article 4(3)</td>
<td>As regards the cost-benefit analysis, the stakeholder stressed the importance of taking into account market parties, especially the role of the generating asset owner in this exercise, and to clarify who is expected to carry the burden of the costs – any CBA should be neutral and ensure a level playing field between the TSOs and generators.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>National Grid ESO</td>
<td>Article 4</td>
<td>The stakeholder argues that it is very unclear how the requirements will apply to i) generation caught prior to RIG 1.0, ii) generation caught by RIG 1.0 and iii) generation caught by RIG 2.0. We believe this needs to be articulated in RIG 2.0 in a more precise way so that it is clear what requirements apply to what party.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>EDF</td>
<td>Article 4</td>
<td>The stakeholder proposes adding wording to paragraph (2)(b), in order to propose three years for all PGMs. The stakeholder considers that if the generator has concluded a final and binding contract for the purchase of the main generating plant by 3 years after the entry into force of this Regulation, it should not apply.</td>
<td>Disagree</td>
</tr>
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<tr>
<td><strong>NC RIG</strong></td>
<td>VGBE, COGEN Europe</td>
<td>Article 6(4)</td>
<td>One stakeholder proposes to include type D PGMs of facilities for combined heat and power production embedded in the networks of industrial sites relating to the capability to maintain constant active power output or to modulate active power output. Another stakeholder notes that the sentence shall force to have an explicit statement in the NC RIG.</td>
<td>Disagree</td>
</tr>
<tr>
<td><strong>NC RIG</strong></td>
<td>VGBE, COGEN Europe, Eurelectric, EU Turbines, Wind Europe, EDF</td>
<td>Article 7(3)</td>
<td>Some stakeholders propose to remove or amend the provision that local system needs should be considered. Another stakeholder proposes to delete Article 7(3), as this gives TSOs excessive competences without evident justification. Another stakeholder proposes that IEC and EN testing standards are accepted to verify compliance against this document.</td>
<td>Disagree</td>
</tr>
<tr>
<td><strong>NC RIG</strong></td>
<td>EU DSO</td>
<td>Article 7(9)</td>
<td>The stakeholder argues that this paragraph should be deleted. The requirement was probably appropriate in 2016 as the NC RIG was being originally implemented. However, the NC RIG has been in force for several years and is well established. In addition, it is also inappropriate for TSOs to develop those requirements which DSOs should develop, given DSOs’ legislative duties under Regulation (EU) 2019/943.</td>
<td>Disagree</td>
</tr>
<tr>
<td><strong>NC RIG</strong></td>
<td>EU DSO, EDP, E-RIDES, Eurelectric, Enel Group</td>
<td>Article 11</td>
<td>The stakeholders propose to add into the article the EU DSO Entity for the purposes of the responsibility for stakeholder engagement as now it is shared between ENTSO-e and the EU DSO Entity.</td>
<td>Agree</td>
</tr>
<tr>
<td><strong>NC RIG</strong></td>
<td>EU DSO</td>
<td>Article 13(2)(a)</td>
<td>The stakeholder proposes that the time period for operation for the frequency range of 47.5 Hz to 48.5 Hz is standardised at 90 mins. This is in line with EN 50549-10 and would be more consistent for manufacturers and RSOs. The stakeholders propose to harmonise the frequency ranges, 47.5 Hz-48.5 Hz for 60 min, 48.5 Hz-49.0 Hz for 90 min, 49.0 Hz-51.0 Hz for unlimited, 51.0 Hz-51.5 Hz for 30 min.</td>
<td>Disagree</td>
</tr>
<tr>
<td><strong>NC RIG</strong></td>
<td>EU DSO, E-RIDES, Eurelectric, Enel Group</td>
<td>Article 13(2)(a)</td>
<td>One stakeholder proposes to harmonise the frequency ranges, 47.5 Hz-48.5 Hz for 60 min, 48.5 Hz-49.0 Hz for 90 min, 49.0 Hz-51.0 Hz for unlimited, 51.0 Hz-51.5 Hz for 30 min.</td>
<td>Disagree</td>
</tr>
<tr>
<td><strong>NC RIG</strong></td>
<td>Undisclosed stakeholder</td>
<td>Article 13(2)(a)</td>
<td>The stakeholder suggests that it should be made explicit what the effect is if type A PGMs do not comply with the rates-of-change over time. It should be possible to add a bandwidth in time or frequency a PGM has to comply with.</td>
<td>Disagree</td>
</tr>
<tr>
<td><strong>NC RIG</strong></td>
<td>Finnish Energy</td>
<td>Article 13(2)(b)</td>
<td>The stakeholder suggests that the requirement should be compatible with EN 50549-1, given the 500 ms measurement window for RoCoF tripping. However, care should be taken that PGMs are tested accordingly, to withstand the 4 Hz requirement.</td>
<td>Disagree</td>
</tr>
<tr>
<td><strong>NC RIG</strong></td>
<td>Enel Group</td>
<td>Article 13(2)(b), Article 13a(1)</td>
<td>The stakeholder proposes to complement the point (iv) that the thresholds of the RoCoF-type loss of main protection “shall not jeopardise frequency ride-through performance except in case of local and temporary needs”.</td>
<td>Partly agree</td>
</tr>
<tr>
<td><strong>NC RIG</strong></td>
<td>Enel Group</td>
<td>Article 13(2)(c)</td>
<td>The stakeholder notes that the reference to (b)(iii) is wrong as it should be (b)(iv).</td>
<td>Agree</td>
</tr>
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<tr>
<td>NC RfG</td>
<td>EU DSO, E.ON</td>
<td>Article 13(2)(c)</td>
<td>The stakeholders suggest that in order to ensure that DSOs’ anti-islanding protection is not compromised, the words “anti-islanding schemes” should be added to paragraphs 13.2(c).</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Swedenergy</td>
<td>Article 13(2)(c)</td>
<td>The stakeholder proposes to exclude type D from the application of this provision, as it refers to point (b), which is excluded from type D according to Article 19(1).</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>EU DSO, E.ON</td>
<td>Article 13(2)(d)</td>
<td>The stakeholders propose that for some Member States an operating period of 10s for 52.5Hz it interferes with the arrangements for controlling DSOs’ standby power supplies. Changing this to 5s would avoid this and obviate the need for these control schemes to be reengineered.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>EU DSO, Enel Group</td>
<td>Article 13(7)</td>
<td>The stakeholders propose that the signal to a type A PGM (not just to an ESM) would be for the modulation of active power output – as the control cannot just be one way, i.e., for when the restriction on active power output is removed.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Enel Group</td>
<td>Article 13(7)</td>
<td>The stakeholder also proposes to provide that the TSO in agreement with the relevant system operator shall define the framework conditions for the use of this function adopting a proper communication network.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>EU DSO</td>
<td>Article 13(9)</td>
<td>The stakeholder is proposing some changes to this paragraph because DSOs need to be able to change the default settings. Apart from operational needs of local networks, some countries have or plan to have in place stricter ranges that need to be reflected in order to be in coherence with the National Regulation. For example, in Spain DSOs must comply with Royal Decree 1955/2000 and maintain voltage within the range of ±7%, which will not be possible if PGMs are allowed to work outside of this range.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>EU DSO, EUROPGEN, Eurelectric, Bundesverband Solarwirtschaft e.V., VDE FNN, EUTurbines, Oesterreichs Energie, Wind Europe, Enron, ACCIONA, AEE</td>
<td>Article 13(10), Article 17(2), Article 20(3), Article 21(4)</td>
<td>Some stakeholders propose to add that the power generating module shall be capable of providing reactive power automatically by voltage control mode, reactive power control mode, power factor control mode or active power-related power factor control mode (as is specified in EN 50549). In addition, the power generating module shall be able to receive and react to an external signal allowing the relevant system operator to transmit reactive power or voltage control mode set points. Other stakeholders propose to clarify this requirement as it could lead to multiple possible interpretations. The device cannot guarantee constant voltage at its terminals. It can only contribute to a more constant voltage. Also, the reactive power should be always in line with the P-Q capability chart. One stakeholder proposes that the control mode should be specified in coordination with the power park module owner. Two stakeholders argue that any additional reactive power capability shall be always procured by market-based ancillary services.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>EU DSO, EUROPGEN</td>
<td>Article 17(2)(a), Article 19(2)</td>
<td>The stakeholder proposes to add boundary limits of the expected reactive power capability. They shall not exceed type C0 limits and in general they shall be defined based on typical capabilities associated to technologies.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>EU DSO, VDE FNN, E.ON</td>
<td>Article 13(11)</td>
<td>The stakeholders propose to block LCSM as it may be important for local network management reasons. EU DSO proposed for LCSM-O for PGMs in Article 13 and LCSM U for PGMs in Article 15. It is also appropriate to add this for PGMs incorporating storage in Article 13.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Enel Group</td>
<td>Article 13(11)</td>
<td>The stakeholder proposes that the interval or thresholds for ΔT1 are reported directly in Article 13 (paragraph 3(c)). In point (e) is clarified the reference to ESM since they are defined in Article 2.</td>
<td>Disagree</td>
</tr>
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<tr>
<td>NC RIG</td>
<td>COGEN Europe, CENELEC, Elnet Group</td>
<td>Article 14(3)(g), Article 15(2)(c)(i)</td>
<td>The stakeholders suggest removing the provision that the power generating module shall be able to receive and react on an external signal allowing the relevant system operator to block active power LFSM-O mode in real-time from the text since it is introducing a higher complexity and may arise legal responsibility topics and cybersecurity issue.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>COGEN Europe, EU Turbines, Gunnar Kaestle</td>
<td>Article 15(4)(a)</td>
<td>The stakeholder proposes amendments with regard to block start capability, such as to remove the requirement for LFSM, add provisions regarding load acceptability, delete the word parallel from the phrase 'be capable of parallel operation' and delete the word automatically from the phrase control voltage automatically'.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>EU DSO</td>
<td>Article Y(4)</td>
<td>As regards the voltage range after the fault has been cleared, the stakeholder proposes to add that other range may be specified by the relevant system operator in coordination with the relevant TSO.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>VGBE</td>
<td>Article 15(2)(c)</td>
<td>The stakeholder argues that it is not clear what LFSM-U provision prevails for type G ESM, the one in Article 13(11) or in Article 15(2)(c). In addition, it is proposed that having an external signal allowing the relevant system operator to block the LFSM-U mode in real-time is a cyber-security risk.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>VGBE</td>
<td>Article 15(4)(b)(ii)</td>
<td>The stakeholder notes that the original paragraph 3 referred to the article has been removed.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>COGEN Europe, EU Turbines, WindEurope, Enercon</td>
<td>Article 15(4)(b), Article 15(4)(c)</td>
<td>The stakeholders propose amendments to the text with regard to the capability to take part in island operation and to re-synchronisation capability.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Enercon</td>
<td>Article 15(4), Article 15(5)</td>
<td>The stakeholder proposes to define the term &quot;block load&quot; and specify what considers &quot;quick&quot; re-synchronisation capability in 4(c). It was suggested to replace &quot;properly&quot; with &quot;adequately&quot; in 5(c)(i), &quot;all&quot; to &quot;the required&quot; and remove &quot;open source&quot; in 8(c)(iii).</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Enercon</td>
<td>Article 15(4)(b)(vi)</td>
<td>As regards the capability to take part in island operation, the stakeholder suggests that some more clarification is needed of what is expected from PGMs for their operation between 0 and their Minimal Operating Point. How long, and in which conditions.</td>
<td>Further details may be provided in the national regulatory framework and specified in the connection agreement.</td>
</tr>
<tr>
<td>NC RIG</td>
<td>CENELEC, Eurelectric, Elnet Group</td>
<td>Article 14(3)(a)(iv), Article Y(3)</td>
<td>The stakeholders suggest that there should be an agreement between the TSO and the DSO, or that the relevant system operator shall specify the pre-fault and post-fault conditions for the fault-ride-through capability.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>COGEN Europe, EU Turbines</td>
<td>Article 14(3)(a), Article 16(3), Article X</td>
<td>The stakeholders argue that it is today common practice during the verification process to consider the LVRT shape as a multiple fault characteristic. The generating unit is then tested against each of such fault's conditions represented by a rectangular shaped voltage against time profile. The proposed text is used to align to such common practice used to verify robustness of the generating unit.</td>
<td>Party agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>CENELEC, COGEN Europe, EDP, EUGINE, Eurelectric, E-REDIES, undisclosed stakeholder</td>
<td>Article 14(3)(b)</td>
<td>Some stakeholders propose that fault-ride-through capabilities in case of asymmetrical faults should not exceed the limits imposed under Article 14(3)(a) for symmetrical faults. Two stakeholders argue that the NC RIG should strive for having uniform requirements on that, so to facilitate all conformity checking processes and remove unduly barriers to cross border equipment sales. One stakeholder requests to clearly define the type/sequence of asymmetry needs to be positive, negative or Zero.</td>
<td>Disagree</td>
</tr>
</tbody>
</table>

The specific provision is important for local network management reasons. Furthermore, this is elaborated in ENTSO-E IGD on limited frequency sensitive mode. Specific cybersecurity issues are in general out of scope of the NC RIG and dealt with by the Cybersecurity Network Code.
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<td>CENELEC, Cogen Europe, EUGINE, EUROGEN, EUTurbines undisclosed stakeholder, Oesterreichs Energie, WindEurope, Enel Group</td>
<td>Article 14(2), 14(3)(c) (NC RfG) Article 13(1), Annex II (NC DC)</td>
<td>The stakeholders argue that as Fig X demands to ride through voltage swells up to 1.3 p.u. for 100 ms, this may not be technically feasible for some components of present generating modules. The stakeholders also argue that OVRT for type A and B has been standardised in EN 50549 since 2019 with a survey in 2022 resulting in no need to increase the present values of 125%® 100ms. They propose to use the OVRT curve being state of the art in Europe in NC RfG or refer to this standard. Also, the option to further increase the requirements by the TSO/RSO results in a very unsecure situation. Some stakeholders propose that appropriate technical justification shall be provided to operate at longer times or even no longer times should be defined. Another stakeholder proposes to move the OVRT requirement in Article 14(2)(b), as this requirement can be applied at voltage connection levels greater or equal to 110 kV. One stakeholder argues that with typical protection relays (U&gt;, U&gt;&gt;) there could be a contradiction between the relevant system operator’s protection concept and the full activation of HVRT in certain grid areas. Two stakeholders consider that the duration of a 60 seconds at 1.2U/p.u looks challenging for the industry. One stakeholder argues that requiring 1,2pu for 60 seconds will lead to oversizing of primary equipment causing extra costs. Also, the protection settings of new power plants would have to be set acc. to 1,2pu/60 sec which would cause extra stress for old equipment in the grid as it might lead to prolonged overvoltages in the range of 1,1-1,2pu which would not be switched off rapidly.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>EUROGEN</td>
<td>Article 14(3)(c), Article 15(4)(a)(iv)</td>
<td>The stakeholder proposes to add a reference to paragraph 12 of Article 13 as Article 14(2) specifies voltage levels only for 110 kV and above.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>CENELEC, EDP, Enerlec, E-REDES, Enel Group</td>
<td>Article 14(4)</td>
<td>The stakeholders propose that the DSO should also decide on the reconnection conditions. One stakeholder proposes that the owner of network where type B PG is connected should be considered. Proposal to specify in the connection agreement the reconnection conditions.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Enel Group</td>
<td>Article 14(3)</td>
<td>The stakeholders states that Figure 3 is not aligned with EN50549 – 2 and Tables 3.1.1 and 3.2.1.3.2.2 seem to be not aligned with Figure 3.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>ENTSO-E</td>
<td>Article 15(2)(d)</td>
<td>The stakeholder’s position is that if an ESM is used solely for the purpose of meeting the NC RfG requirements (which in this case the requirement could be FSM), this ESM which is integrated in the PGM shall follow the PGM requirements. The stakeholder considers that this text does not follow EG Storage definitions (autonomous/standalone ESM vs collocated ESM) because FSMs are treated as something different than the PMGs whereas the definition of Article 2 (67) clarifies that an ESM is considered as a PGM with the capability of absorbing (consuming) active power. It should be also explained what is the “energy content” of a PGM that it is not an ESM.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>CENELEC</td>
<td>Article 15(2)(d)(i)</td>
<td>The stakeholder suggests that in the second dashed provision it must be “instead” and “minimum energy.”</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>EU DSO, COGEN Europe</td>
<td>Article 15(4)</td>
<td>The stakeholders propose to remove the prohibition to use switchgear position for detecting islanding.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>EUTurbines</td>
<td>Article 15(5)(b)(iii)</td>
<td>The stakeholder argues that it is not clear what is requested nor for what purpose it shall be used. Therefore, it is proposed to be deleted. The stakeholder suggests that this topic should be discussed with manufacturer prior to introduce such new requirement in the NC RfG.</td>
<td>Disagree</td>
</tr>
<tr>
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<tr>
<td>NC RfG</td>
<td>Fingrid Oyj</td>
<td>Article 14(5)(b)(iii)</td>
<td>The stakeholder considers that both transformer and busbar protection at the substation of the power plant should be considered.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Fingrid Oyj</td>
<td>Article 15(5)(c)(i)</td>
<td>The stakeholder suggests adding the wording “and if needed in electromagnetic simulations” at the end of the first sentence.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>ENTSO-E, Energinet</td>
<td>Article 15(5)(c)(i)</td>
<td>The stakeholders propose to remove the sentence referring to the intellectual property. The NDAs which are made available on projects are capable to safeguard the intellectual property. Also, Article 12 includes the same general provision with regard to confidential information.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>ENTSO-E</td>
<td>Article 15(5)(c)</td>
<td>The stakeholder proposes to consider points (iv) et (vi) for this requirement. EMT model and frequency domain model shall be coordinated with the relevant TSO.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Energie-Nederland</td>
<td>Article 15(5)(e)</td>
<td>The stakeholder proposes that this provision should be either deleted, arguing as it is up to market participants with which ramping speed it wants/need to react to market circumstances, or at least change the wording from “shall” into “may”. The stakeholder also disagrees with ACER’s reasoning on the rejection of the same proposal during previous public consultation.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>COGEN Europe, EUTurbines</td>
<td>Article 16(2)</td>
<td>The stakeholder proposes to delete the phrase ‘have the right to’ in the phrase ‘the relevant TSO shall specify define voltages at the connection point at which type D power-generating module is capable of automatic disconnection’.</td>
<td>The proposed amendment changes the legal meaning of the provision.</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Enel Group</td>
<td>Article X</td>
<td>The stakeholders propose to move the provisions of Article X directly to Article 13. The stakeholder also argues that in relation to the provision that the relevant TSO shall specify the ramping capability which is coherent as long as the type A generating units are connected directly to networks directly owned or managed by TSO; this kind of network generally are in HV or EHV levels. It is also inquired whether in other case (so level of voltages) it would be the EN 50549 standards.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG and NC DC</td>
<td>ENTSO-E, Oesterreichs Energie</td>
<td>Article 16(3), Article 16(3)(a)(i)</td>
<td>The stakeholders propose to delete the clause “when operating above their minimum stable operating level”. Some stakeholders may misunderstand it and misuse it. They also argue that the operation point changes due to a dynamic event, see faults. For example, if there is a fault, the active power may oscillate and go below the minimum stable operating level, so this may trip the PGM canceling the need for FRT. It makes sense to have this in the pre-fault condition. Hence, the stakeholders suggest that this needs to be transported in the protol. In addition, the same is proposed for V1G FRT provision in NC DC.</td>
<td>The proposed amendment changes the legal meaning of the provision.</td>
</tr>
<tr>
<td>NC RfG</td>
<td>VGBE</td>
<td>Article 18(1)</td>
<td>The stakeholder proposes to add an exception for Article 13(10) since there is provision for voltage control in Article 17(2)(b).</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>COGEN Europe, EUTurbines</td>
<td>Article 17(2)(b)</td>
<td>The stakeholders propose to align the wording regarding voltage control system as with the Article 19(2)(a).</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>COGEN Europe</td>
<td>Article 17(3)</td>
<td>The stakeholder suggests to delete Article 17(3) since it was meant for other technologies and natural behaviour of SPGM should be already acceptable.</td>
<td>Disagree</td>
</tr>
<tr>
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<tr>
<td>NC RIG</td>
<td>VGBE, COGEN Europe</td>
<td>Article 13(10), Article 18(2)</td>
<td>One stakeholder argues that the application of European Standards should be the normal approach in implementing NC RIGs, not only the “consideration” of standards. Another stakeholder proposes that capabilities to support voltage shall be based on European standardisation.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>EUTurbines, Enel Group</td>
<td>Article 18(2)(a)</td>
<td>Reactive power requirements are specified at the Point of Common Coupling (connection point) therefore it is not clear what the requirement is addressing. PGU capabilities normally consider reactive power associated to the equipment installed in the Power Generating Facility. The article should also clarify who must provide what. The stakeholders propose either to draft the article with more clarity or delete it.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>VGBE</td>
<td>Article 18(2)(c)</td>
<td>The stakeholder proposes to add the active and reactive power losses of the high-voltage line or cable between the high-voltage terminals of the step-up transformer of the synchronous power-generating module or its alternator terminals.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>EDF</td>
<td>Article 19(2)</td>
<td>The stakeholder argues that in Article 19(2)(a)(iii), on power system stabilisers (PSS) function, the requirement concerning the inter-oscillation mode should be removed.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>VGBE, COGEN Europe, EUTurbines</td>
<td>Article 19(2)(a)(iii)</td>
<td>The stakeholders propose to add wording that a PSS function to attenuate power oscillations is required, if the synchronous power-generating module size is above a value of maximum capacity specified by the relevant TSO, since a PSS is not required in several Member States.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>ENTSO-E</td>
<td>Article 21(2)(d)(i)</td>
<td>The stakeholder proposes amendments so that only the relevant system operator, in coordination with the relevant TSO and not with the power park module owner, shall specify which of the four reactive power control modes and associated setpoints is to apply.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>WindEurope</td>
<td>Article 21(2), Article 22(2), Article 55(7)</td>
<td>The stakeholder proposes amendments to the articles such as, removing active power related power factor control mode and with regard to power oscillations damping control.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>VGBE</td>
<td>Article 51(2)(b)</td>
<td>The stakeholder proposes to include the phrase “taking into account the droop settings and the deadband”, as is the case in Article 52(2)(b).</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>EU DSO, CENELEC, COGEN Europe, EUTurbines, WindEurope, Enel Group</td>
<td>Article 51, Article 52, Article 55</td>
<td>One stakeholder proposes that the request for a stability compliance for the LFSM-O control shall be in co-ordination with the relevant system operator. Another stakeholder proposes that the DSO should also be able to require a stability compliance for the reactive power control in a close loop operation. Other stakeholders propose to remove stability compliance for the reactive power and LFSM-U control in a close loop operation as it is argued that these control modes are not defined in NC RIG.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>COGEN Europe, Eurelectric</td>
<td>Article 51(6)</td>
<td>The stakeholder argues that it is common practice to check the capability of the generating unit considering worst case scenario rather than during a step change in the short circuit current. Simulations are carried out on data provided by the system operator. The stakeholder proposes to keep the present procedure. The step change would be in any case questionable. One stakeholder suggests elaborating a specific test strategy for this feature in order to consolidate this with the manufacturer of the PGU.</td>
<td>Disagree</td>
</tr>
<tr>
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<tr>
<td>NC RIG</td>
<td>VGBE, COGEN Europe</td>
<td>Article 52(4)(a)</td>
<td>The stakeholders propose to delete the text: 'in addition to point (b) of Article 51(2) as well as point (c) of Article 52(2), the power-generating module shall demonstrate its technical capability to control stably the frequency within the frequency range specified in Table 2 in island operation in parallel to a load, based on FSM. Load steps leading to active power increase and decrease between 0% and 2% shall be considered; the control structure and parameters that are applied during normal grid operation shall be applied during island operation. If parameter changes are necessary, they shall not affect the damping or small-signal stability, as this is not a result of the Expert Group ISSM.'</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Bundesverband Solawirtschaft e.V.</td>
<td>Article 15(2)</td>
<td>The stakeholder proposes an addition to paragraph (c) to clarify that an operational setpoint change of a PGM or ESM should be neglected, once the frequency threshold is crossed, as long as the frequency returns, this is a difference in relation to FSM. As regards subparagraph (v), the stakeholder proposes to delete 'maximum' as it does not make sense. As regards paragraph 2, the stakeholder considers that there are too many variables, and that it should be limited to maximum capacity or actual capacity, just like with PPMs, and proposes to delete 'maximum capacity or maximum consumption'. The stakeholder also proposes some amendments to paragraph (d) to improve the comprehension of the sentences.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Bundesverband Solawirtschaft e.V.</td>
<td>Article 15(4)</td>
<td>The stakeholder pointed out the need to check the reference as there is no existing paragraph 21(5)(d).</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>CEZ, Eurelectric</td>
<td>Article 15(4)(a)</td>
<td>As regards black start (BS) capabilities, in the case of pumped storage with BS capability, the stakeholder considers that it cannot be guaranteed that the power-generation module will be able to be operational for the full system restoration phase in case this would go beyond the pumped storage availability, hence only a certain amount of MWh can be guaranteed for such assets, similar to large battery storage systems with BS capability.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>AEE, Enercon</td>
<td>Article 15(5)</td>
<td>The stakeholders consider that the TSO shall define, subject to public consultation and approval of relevant stakeholders, the verification standards and acceptance criteria considering state-of-the-art international standards and suggests inserting this wording in paragraph (c)(i).</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>E.ON</td>
<td>Article 17(1) and 19(1)</td>
<td>The stakeholder suggests wording improvements to this article to clarify the references to the exceptions.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Swedenergy, E.ON</td>
<td>Article 18(2)(b)(ii)</td>
<td>One stakeholder argues that the enlarged area of operation (Figure 7) with high reactive power production (lag) and by adding a lower outer voltage level (14.2) could make it difficult to operate generator and also close to stator current limit. One stakeholder argues that Figure 7 should refer to maintaining the current boundary line at 0.41 Q/P (consumption lead).</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Energie-Nederland</td>
<td>Article 18(2)(b)(ii), Article 21(3)(b)</td>
<td>The stakeholder notes that the reference to Article 13(10) in Figure 7 and Figure 8 is incorrect.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>E.ON</td>
<td>Article 19(3)</td>
<td>The stakeholder suggests referring to 'system operator' in this paragraph as many power generating facilities are connected to the distribution network (110 kV). Therefore, the TSO should set the parameters, but any agreement or contract with the facility owner should be made by the relevant system operator.</td>
<td>Disagree</td>
</tr>
</tbody>
</table>

This article includes provisions for verification of compliance for the requirements for PGMs to exhibit a stable control behaviour in different modes of operation and in switching between modes. Relevant amendments have been introduced in the NC RIG for clarity where applicable. ACER considers that the existing requirements are set out in a sufficiently clear and explicit way. ACER considers that the current wording adequately describes the required capabilities. ACER revised the text for legal clarity and ensured that references are corrected. It is noted that the position, size and shape of the inner envelope in Figure 7 are indicative. ACER corrected the reference.
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<td>NC RfG</td>
<td>Iberdrola, ACCIONA, AEE</td>
<td>Article 21(2)(a), Article 21(2)(b)</td>
<td>The stakeholders propose to specify in this Article that the requirements are not applicable in the cases where national legislation imposes obligations for several power park modules, even when they are from different owners, to use and share the same electrical infrastructure up to the point of connection, and additional supplementary reactive power has not been requested by the relevant authority when authorising the shared use. The stakeholders argue that shared connection grids have existed for over 20 years in Spain and there have not been any requirements imposed by authorities or TSO/RSO for supplementary reactive power. If this requirement is not delimited, for existing PPMs in one of these shared connection grids means a retroactive application of NC requirements and co-financing the grid connection costs of new PPM connected to the same shared connection grids. If apply to new PPMs only, a new PPM would bear over costs derived from the need to over-compensate electrical infrastructure beyond what is needed for the evacuation of its maximum capacity.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Enel Group</td>
<td>Article 21(3)</td>
<td>The stakeholder suggests that the requirements given through Figure 9 should be generic for a PPM (including BESS). However, P-Q graph indicated in Figure 9 seems not to be applicable for a BESS/EMS where active power could be either positive or negative.</td>
<td></td>
</tr>
<tr>
<td>NC RfG</td>
<td>ACCIONA, AEE</td>
<td>Article 22(2)</td>
<td>The stakeholders propose to add the wording: “If specified by the relevant TSO” to this article as oscillations damping control is not yet a standard control for all type of PPM. It should remain a voluntary requirement or an agreement between the PPM owner and the relevant TSO.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>CEZ, EDP, E-REDES, Eurelectric</td>
<td>Article 33</td>
<td>The stakeholders suggest including in the title: “Procedure for type B, C and D power-generating modules”, as the procedures defined for type D should also be applicable for types B and C to facilitate the connection of these generators. The stakeholder considers that otherwise there is a different understanding in different Member States. For the same reasons, the stakeholders propose also to include in article: “The operational notification procedure for connection of each new type B, C and D power-generating module shall comprise (…)”.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Enel Group</td>
<td>Article 47, Article 48, Article 54, Article 55</td>
<td>The stakeholder proposes to explicitly provide that in stead of the relevant test, the power generating facility owner may use equipment certificates issued by an authorised certifier using harmonised standards / documents to power equipment.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Bundesverband Kraft- Wärme-Kopplung e.V.</td>
<td>Other articles</td>
<td>The stakeholder submitted a general comment regarding the use of European standardisation (EN 50549-1/2). The EN 50549 takes into account into detail the differentiation between inverters and asynchronous generators, and also the requirements with today come from the gas appliance directive and related harmonised standards. This relates to the structure of definitions, and the fact that Power Park Modules include also asynchronous generators which is used for some micro-CHP, micro-hydro, etc. NC RfG should link to EN 50549 or adopt the differentiations made there.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Bundesverband Kraft- Wärme-Kopplung e.V.</td>
<td>Other articles</td>
<td>The stakeholder suggests that the amendment process of the grid connection network codes, which in its view should be made simultaneously so that improvements in the technical discussion will affect all those related network codes. The stakeholder considers that this will avoid a deadlock of common definitions and requirements.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Undisclosed stakeholder</td>
<td>Other new provisions</td>
<td>The stakeholder argues that a number of ENTSO-E amendment proposals introducing additional requirements for PGMs with a level of justification that was not always satisfactory were taken on board. It will be important to assess in detail whether all these new requirements remain proportionate for PGMs/ESMs. Only quantified elements (cost benefit analysis) will make it possible to assess proportionality and qualitative analyses cannot be sufficient.</td>
<td>Disagree</td>
</tr>
</tbody>
</table>

Article 21(2)(b) includes provision regarding reactive power capability at maximum capacity. These provisions exist in the current NC RfG and have been agreed with Member States. ACER does not see the necessity to change these provisions.

It is important that type D PPMs should be able to damp power oscillations. The requirements on power oscillations damping control contained in the NC RfG reflect the present and future system needs.

The operational notification procedure for connection of type D PGMs is comprised of more steps due to the size of these PGMs and their impact on the system. Therefore, imposing this procedure to types B and C PGMs is deemed disproportionate.

The provision that the facility owner may use equipment certificates for types B, C and D is provided in Articles 44, 45, 46, 47, 48, 49, 51, 52, 53, 54, 55 and 56.

When applying NC RfG Member States, competent authorities and system operators should take account of agreed European standards and technical specifications as per Article 7(3)(f) of NC RfG. The current reference is deemed sufficient for promoting further harmonisation through the European standards.

ACER highlights that the underlying justification for a number of amendments are the technical standards in use. The requirements contained in the NC RfG reflect the present and future system needs and are further justified in different expert group reports where relevant.
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<td>NC RIG</td>
<td>EDP, Eurelectric E-REDES</td>
<td>Recital (16)</td>
<td>The stakeholders consider that the recital states an important principle that is not being followed entirely. As a consequence, power generator modules are often required to test for different national non-exhaustive requirements in different countries thus creating an unneeded barrier and complicating the compliance checking for the relevant system operator. The stakeholder proposes to highlight this recital in the comments to NC RIG and replace “should” with “must”.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>EDP, E-REDES, Eurelectric, CEZ</td>
<td>Article 13(2)</td>
<td>The stakeholders argue, in relation to Table 2, that it is not defensible that for a synchronous area each country should have a different frequency without criterion. The diverse requirements in each country create an artificial barrier and entail various conformity checks by the equipment suppliers. ENTSO-E should play an important part in bringing together the TSOs to define these criteria for each synchronous area.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>EDP, E-REDES, Eurelectric, Fingrid Oyj</td>
<td>Article 13(9)</td>
<td>The stakeholders consider that is not clear which entity will decide on the autonomous settings for reconnection, so it should be clarified that the default setting should be as follows, unless otherwise specified by the relevant system operator. The stakeholder also argues that 4% setting for voltage mismatch in point (f) may be too low. Fingrid proposes 5% as 4% might be too small difference in weak grid.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>ENTSO-E</td>
<td>Recital (15)</td>
<td>The stakeholder proposes to replace ‘exceptional cases’ with ‘emergency state’ to improve the legal text.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC DC</td>
<td>ENTSO-E</td>
<td>New recital</td>
<td>The stakeholder proposes a new recital which already exists in NC RIG (Recital 25*) but it slightly modified for meeting the purpose of NC DC.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC DC</td>
<td>Gunnar Kaestle</td>
<td>New recital</td>
<td>The stakeholder proposes a new recital for dispatchable loads.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>ENTSO-E</td>
<td>New recital</td>
<td>The stakeholder proposes a recital section that would enable the TSO to provide additional requirements if needed to ensure system stability. The stakeholder argues that this is also in line with the need of some states to define national level rules for data centres or large industrial sites like heating boilers and facilities with power to gas demand units.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>CENELIEC, Enel Group</td>
<td>Article 2(1)</td>
<td>The stakeholders propose to include in the definition of demand facility with or without the presence of power generating modules.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>Terna Spa</td>
<td>Recital (15)</td>
<td>The stakeholder proposes deleting Recital (15), because it can be misunderstood. The LFSM UC cannot replace the demand disconnection in emergency state.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>ENTSO-E, Energinet</td>
<td>Annex II</td>
<td>The stakeholders would like to raise the fact that for the Nordic system, there is a need to modify the Annex II in NC DC to include the range 0,85-0,90 pu.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC DC</td>
<td>ENTSO-E</td>
<td>Article 15(1)</td>
<td>The stakeholder proposes to include in the proposal the situation with multiple connection points.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC DC</td>
<td>EU DSO, Oesterreichs Energie, VDE-FNN, Finnish Energy, Enel Group, E.ON</td>
<td>Article 19(1)(c)</td>
<td>One stakeholder proposes to rephrase the text regarding specifications to relay tripping time to improve legal certainty and clarify. Another stakeholder argues that a relay tripping time of 100 ms is technically not feasible. A stable operation of UFLS relays needs at least 150 ms to avoid unintentional tripping. Another stakeholder suggests that a tripping time of 120 ms is deemed realistic and is the technical standard in Germany. Additionally, existing concepts for LFDD should not be jeopardised. Another stakeholder argues that the frequency measurement window and tight relay tripping times should be very carefully considered. In principle, low frequency demand disconnection is a good addition, but there are some doubts that the local frequency measurement can be accurate enough, given the very fast reaction times proposed. Faster reaction time equals less accurate measurement.</td>
<td>Partly agree</td>
</tr>
<tr>
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<tr>
<td>NC DC</td>
<td>ENTSO-E</td>
<td>Article 20</td>
<td>The stakeholder proposes to modify the article on power quality so that it provides clarification that power quality parameters should be not only limited to fluctuation and distortion of voltage sinus wave but to all relevant power quality parameters, according to specification of relevant TSO, at the connection point.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>ENTSO-E</td>
<td>Article 21(5)</td>
<td>The stakeholder proposes that only the TSO should specify the requirements of the performance of the recordings.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC DC</td>
<td>EU DSO, EDP, E-REDES, Eurelectric, Enel Group</td>
<td>Article 10</td>
<td>The stakeholders propose to add into the article for the purposes of the responsibility for stakeholder engagement now being shared between ENTSO-E and the EU DSO Entity.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC DC</td>
<td>EU DSO, CENELEC, Enel Group, National Grid ESO</td>
<td>Article 15(2)</td>
<td>The stakeholders propose that the agreement of the DSO is important as the potential impact on DSO operation may be very significant. The stakeholders believe that a threshold cannot therefore be unilaterally imposed on a DSO without all such implications being understood and agreed.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC DC</td>
<td>EU DSO, EDP, E-REDES, Eurelectric</td>
<td>Article 17(2)</td>
<td>The stakeholders propose to remove the phrase 'on 1-phase faults' as it is not clear why it is necessary to limit agreement to single phase reclosing when there could be relevant aspects to agree for three phase reclosing.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC DC</td>
<td>CENELEC, Enel Group</td>
<td>Article 19(4)</td>
<td>The stakeholders propose to clarify that for transmission-connected distribution facility the logic interface input port could better be replaced with a command to the SCADA system.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>CENELEC, Enel Group</td>
<td>Article 20, Article 21(2)</td>
<td>The stakeholder proposes to clarify the point by adding to specify the output data format and the simulation tools, in agreement with the relevant distributor system operator.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC DC</td>
<td>EU DSO</td>
<td>Article 25(3)(c)</td>
<td>The stakeholder proposes to add text to make it clear that the sub paragraph applies to transmission connected demand facilities only, and not all demand facilities.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC DC</td>
<td>EU DSO, EDP, E-REDES, Eurelectric, Enel Group</td>
<td>Article 28(2)(d)</td>
<td>The stakeholders propose to change &quot;TSO&quot; to &quot;system operator&quot; in order to include DSOs in point (d), as those services are available to all RSOs, not only to TSOs.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC DC</td>
<td>EU DSO, Enel Group</td>
<td>Article 31, Article 32</td>
<td>The stakeholders propose to delete the phrase 'providing demand response services' arguing that a demand unit not providing a service is specifically excluded from the scope of the NC DC in Article 31(1)(d).</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>EU DSO</td>
<td>Article XX(4)</td>
<td>The stakeholder proposes to add the provision for heat pumps to have the capability to be able to receive and react on an external signal allowing the relevant system operator to block active power LFM-U-C mode in real-time.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>EU DSO, Eurelectric, Enel Group</td>
<td>Article XX(5)</td>
<td>The stakeholders propose to add power-to-gas and heat pumps in the specific provision.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>Eurelectric</td>
<td>Article XX+1</td>
<td>The stakeholders propose to delete &quot;(...) and heat pumps demand units&quot; as in some Member States heat pumps are treated like any normal customer load behind the meter. This could be different in other countries, but it should not imply to have a notification procedure for heat pumps across the whole EU.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC DC</td>
<td>EU DSO</td>
<td>Article 49(1)</td>
<td>The stakeholder argues that it is appropriate that the timescales here should be agreed between the relevant TSO and the relevant system operator.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>VGBE, WindEurope</td>
<td>Article 35</td>
<td>The stakeholders propose to reinstate Article 35(5) regarding granting an extension of the period during which the power-generating facility owner may maintain ION status, beyond the period established in paragraph 4, if a request for a derogation is made.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>Terna Spa</td>
<td>Article 19(1)(c)</td>
<td>The stakeholder suggests in order to make better manageable the LFDD, the frequency measurement accuracy be reduced to 10mHz.</td>
<td>Partly agree</td>
</tr>
<tr>
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<tr>
<td>NC RfG</td>
<td>Energie-Nederland</td>
<td>Article 15(1), Article 16(1)</td>
<td>The stakeholder considers that the provision in Article 14(5)(d)(iii) on fault recording if required by the relevant system operator, should not be exempt from application by types C and D PGMs.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Moeller Operating Engineering GmbH, Swedenergy</td>
<td>Article 15(2)</td>
<td>The stakeholder notes that the numbers and percentages in Table 4 need to be consistent.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>VDE FNN</td>
<td>Article 15(2)</td>
<td>The stakeholder requests to clarify that FSM operates on top of active power operating points. A change (also an increase) in active power availability will affect the active power output. Paragraph &quot;the actual delivery of active power frequency response depends on the operating and ambient conditions, as well as, on the underlying energy storage technology for the, of the power generating module when this response is triggered, in particular, but not limited to, limitations on operation near maximum capacity at low frequencies according to paragraphs 4 and 5 of Article 13 and available primary energy sources&quot; does not make sense. Figure 5: 2nd bullet does not make sense. FSM cannot have the LFSM threshold as a trigger point for Pref.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>VDE FNN</td>
<td>Article 15(5)(c)(v)</td>
<td>As below a frequency of 100 Hz the operating point has a strong influence on the converter impedance, the stakeholder suggests a starting frequency of 100 Hz.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>VDE FNN, Enel Group</td>
<td>Article 22(2)</td>
<td>The stakeholder argues that many PPM are connected to the distribution network (110 kV). Therefore, the TSO should set the parameters, but any agreement or contract with the facility owner should be made by the relevant system operator.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Enel Group</td>
<td>Article 13(3)</td>
<td>The stakeholder argues that it could be better to move directly here, in this chapter the table X reported in Article 15(2)(d)</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>National Grid ESO</td>
<td>Article 19</td>
<td>As regards Low Frequency Demand Disconnection Schemes, the stakeholder argues that there are some requirements in Article 15 of the EU Emergency and Restoration Code relating to Low Frequency Demand Disconnection Schemes. It may be appropriate to consider removing the requirements in Article 15(5) – 15(8) of the EU Emergency and Restoration Code and including them in DCC 2.0 or referring to these clauses in DCC 2.0 so that parties are aware of the requirements.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Moeller Operating Engineering GmbH</td>
<td>Article 33</td>
<td>The stakeholder proposes that for type D PGM to go through a certification process so Member States may provide that a PGMD according to Article 32 shall be issued by an authorised certifier for the notification procedure IGN and FON.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Polskie Sieci Elektroenergetyczne (PSE)</td>
<td>Article 2(67)</td>
<td>The stakeholder proposes a revision of the way in which the ESM is taken into account in its current form as they consider that the current definition in practice does not define ESM. The proposed definition is not precise compared to the entire text and the definition of technical requirements for ESM.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>RES Group</td>
<td>Article 2(68)</td>
<td>The stakeholder argues that the proposed text &quot;less any demand or losses associated solely with facilitating the operation of that demand unit or electricity storage module&quot; will cause confusion and it should be deleted. The above exclusion text makes sense where it is used in the definition of &quot;maximum capacity or Pmax&quot;, particularly as Pmax is used for determining the significance of a PGM (i.e. type A, B, C or D). However, it makes no sense and serves no purpose to copy this text over to the definition of &quot;maximum consumption capacity&quot;.</td>
<td>Disagree</td>
</tr>
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</tbody>
</table>
| NC RfG        | EDP, E-REDES | Recital (11), Article X       | The stakeholders argue that the review of the requirements for type A PGMs is in any case required. In this regard, it is necessary to determine which requirements applicable to type B PGMs may also be necessary for type A PGMs in terms of system security. The following candidate requirements were identified by the Expert Group “Baseline for type A PGMs”:
   a) Fault Ride Through (FRT),
   b) Post Fault Active Power Recovery (PFAPR), and
   c) Active Power Control (APC).
The review of the requirements for type A PGMs, namely for power between [250kW: 1MW] or connected with MV grid, should also consider, measures, binary inputs and commands. | Partly agree |
| NC RfG        | RES Group   | Deleted Article 15(3)          | The stakeholder considers that the deleted section allowed distribution system operators to specify over and under voltage protection settings which helped to disconnect generators contained in inadvertently islanded sections of a distribution system where their persistent operation might cause danger from: (a) unearthed energisation of part of the island, or; (b) operation of the island at frequencies or voltages which are outside the required standard, or; (c) might result in inadvertent out-of-phase closure of switches when one side was expected to be dead, with consequent over-currents and transient loads on motors and generators within the reconnected island. The stakeholder recommends that this proposed deletion is discussed with distribution network operators and their representative organisation. | Disagree |
| NC RfG        | RES Group, Cogen Europe, EUGINE, EuTurbines | Article 7(3)(f) | The stakeholders consider that Article 7(3)(f) introduces the unacceptable risk that additional requirements could be introduced via IGDs without the scrutiny and consultation applied to this Regulation. They propose deletion of the reference to IGDs because they should only guide and not specify. | Disagree |
| NC RfG        | Solar Power Europe, Better Energy | Article 7 | As regards Article 7(3) Split (f) into 3: The stakeholders suggest (f) is dealing with 3 different topics and shall be addressed separately and differently. As regards Article 7 paragraph 3(f) the stakeholders argue that:
   1) European standards and technical specifications shall not just be considered. European standardisation and harmonisation is crucial for a cost effective energy transition, especially with regard to mass market products.
   2) Implementation guidance documents developed by ENTSO-E in accordance with Article 59(15) of Regulation (EU) 2019/943, shall have a transparent process, with results that are agreed by all relevant stakeholders. The stakeholders argue that after Article 7(3)(g) a proposal text should be added because it should be clarified that the designated entity has the right to request an explanation from the relevant system operator or the relevant TSO on how the principle in this regulation has been taken into account 7(4) - The timing of the NC RIG amendment is one of the most critical points. The stakeholders argue that even for the current NC RfG with relatively easy to fulfill because of state of the art requirements, the timing (2-3 years) caused massive chaos in the national implementations. Allowing the Member States to provide even shorter time periods is not seen as useful. | Partly agree |
| NC RfG        | Bundesverband Solarwirtschaft e.V. | Article 7(3)(f) | The stakeholder proposes to replace the words ‘take into consideration’ with the word ‘apply’, with regard to European standards. The stakeholder considers that take into consideration is too weak. For the sake of harmonisation, functionality that is already agreed on in European Standards must be taken over and implemented, rather than implementing it nearly the same but slightly different. | Disagree |

The requirements for type A PGMs contained in the NC RfG reflect the present and future system needs and are based also on agreed European standards.

According to the system needs, power generating modules shall stay connected and control voltage within defined ranges. Taking into account reactive power capabilities and voltage control capabilities of power generating units, an automatic disconnection is the worst-case scenario for the system stability. No utilisation of such capability has been identified by TSOs as needed in the future. In addition, no objection has been raised by EU DSO or any other stakeholder regarding the deletion of this requirement.

ACER considers that the current reference is deemed sufficient for promoting further harmonisation through the European standards. According to para 15 of Article 59 of the Electricity Regulation, ENTSO for Electricity may develop non-binding guidance in the areas set out in paragraphs 1 and 2 of Article 59 of the above Regulation, where such guidance does not relate to areas covered by a request addressed to the ENTSO for Electricity by the Commission. The ENTSO for Electricity shall submit any such guidance to ACER for an opinion and shall duly take that opinion into account. Thus, the Guidelines will not be applied without prior consultation and an opinion by ACER.

There is already an obligation that when applying this Regulation, Member States, competent entities and system operators shall apply the mentioned principles. With regard to Article 7(4), it is important that the Member States could provide for a shorter period in order to accelerate implementation.

The current reference as per Article 7(3)(f) of the NC RfG is deemed sufficient for promoting further harmonisation through the European standards.
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<tbody>
<tr>
<td>NC RIG</td>
<td>Enercon, RES Group</td>
<td>Article 21(2)(d), Article 21(2)(e)</td>
<td>One stakeholder considers that in point (d)(ii) it needs to be specified that the stable operation shall be ensured “based on network characteristics (minimum, normal and maximum short circuit capacity at the connection point) to be provided by the relevant system operator”. With regard to point (d)(iv) it is proposed to change 5 seconds with 60 seconds in the time range, arguing that DSOs usually do not want the U-control of PPMs to react within few seconds, so widening the range from 1 to 60 seconds allows the different DSOs to request what they need. Asking for a T1 of 1 to 5s, as done in the current NC RIG, is typical for the UK, but very untypical for the rest of Europe.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Undisclosed stakeholder</td>
<td>Article 21(2)(d)(vi)</td>
<td>The stakeholder proposes to introduce the actual plot in X-Y coordinates depicting the power factor control using reactive power and control reactive power using active power.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>Swedenergy</td>
<td>Article 2 (new definition)</td>
<td>The stakeholder proposes to introduce a new definition of “controlled quantity” as a safety precaution, arguing that the background is the problem of applying power regulation in some of the Swedish hydro power plants.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>VDE FNN</td>
<td>Article 2(18)</td>
<td>The stakeholder argues that on the one hand, a uniform terminology must be used, compared to NC HVAC, but on the other hand, the characteristic of the grid connection point is of great interest for the respective definition and the resulting requirements for the power park modules. Furthermore, the type of connection (HVAC or HVDC) of the power park module to the transmission grid plays an important role to determine the respective requirements.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>VDE FNN</td>
<td>Recital (**4)</td>
<td>The stakeholder considers that voltage control capability and stable LFSM operation are important contributions of non grid forming PPM to power system stability.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>WindEurope, Enercon</td>
<td>Recital (**2)</td>
<td>The stakeholders propose to replace high voltage against-time profile with over voltage against-time profile.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>EDP</td>
<td>Recital (**4)</td>
<td>The stakeholders considers that the recital should explicitly apply to only new PGMs, not the ones already connected.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>WindEurope, Enercon</td>
<td>Recital (23)</td>
<td>The stakeholders argue that for frequency-ranges and all parameters for frequency-control it is even more relevant that the requirements from neighbouring countries within a synchronous area match to each other.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>WindEurope, VDE FNN, Gunnar Kaestle, Enercon</td>
<td>Recital (25)</td>
<td>The stakeholders argue that converter-based is the correct word instead of RES. E.g., hydro power plants are usually designed as synchronous power generating modules. The capability to provide synthetic inertia from converter-based generating technologies is based on technology and product design decisions, it is not an intrinsic (natural) characteristic / limitation of such technologies.</td>
<td>Agree</td>
</tr>
<tr>
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<tr>
<td>NC RfG</td>
<td>Siemens Gamesa Renewable Energy</td>
<td>Recital (27)</td>
<td>The stakeholder argues that European standardisation and harmonisation is crucial for a cost-effective energy transition, especially with regard to mass market product.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Siemens Gamesa Renewable Energy</td>
<td>Article 13(2)(d)</td>
<td>The stakeholder argues that there is no technical justification explaining in detail the background for such extended frequency requirements. The stakeholders argue that it seems it is just added to specified requirements in Table 2 and in conflict with Table 2.</td>
<td>Partially disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Siemens Gamesa Renewable Energy</td>
<td>Article 21(2)(e)</td>
<td>The stakeholder argues that due to deleted Article 20(2)(b), Article 21(2)(e) needs to be rewritten or deleted.</td>
<td>Partially disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Siemens Gamesa Renewable Energy</td>
<td>Article 4(3)</td>
<td>The stakeholders propose to provide “relevant system operators” instead of TSOs, in order to include DDSOs. One stakeholder argues that the proposed changes to Article 4 exclude from compliance to this NC RfG existing PGMs, including PGMs with binding contract signed and closed after 2 years of the entry into force. This article, together with Article 7(1a) (that repeals the current NC RfG) may be removing any requirement to existing PGMs.</td>
<td>Partially disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>EDP, E-REDES</td>
<td>Article 14(2) and (3)</td>
<td>The stakeholders suggest that in paragraphs (2) and (3) it should be specified from what side the short circuit current is measured, and they propose: Paragraph (2): The relevant TSO shall deliver to the transmission-connected demand facility owner or the transmission-connected distribution system operator an estimate of the minimum and maximum short-circuit current contribution to be expected from the transmission system at the connection point as an equivalent of the network. Paragraph (3): The relevant transmission-connected demand facility owner or the transmission-connected distribution system operator shall deliver to the relevant TSO an estimate of the minimum and maximum short-circuit current contribution to be expected from the demand facility or the distribution system at the connection point as an equivalent of the network.</td>
<td>Partially agree ACER has added the word ‘contribution’ to clarify the requirement.</td>
</tr>
<tr>
<td>NC RfG</td>
<td>T&amp;D Europe, VDE FNN</td>
<td>Article 18</td>
<td>The stakeholder argues that this article covers the requirements only for transmission connected demand uses (facilities, distribution systems). However, information exchange between the DDSOs and the distribution connected demand users (EVs, demand facilities etc.) will be needed. The stakeholder proposes clauses covering distribution-connected assets to be added, but no concrete amendment proposals are made.</td>
<td>Partially agree ACER considers that the data exchange with every new object (PGM, demand, HVDC system, etc.) from connection network code should be set in Article 4(5) SO GL or related methodology.</td>
</tr>
<tr>
<td>NC RfG</td>
<td>ACCIONA</td>
<td>Article 9</td>
<td>The stakeholder argues that non-synchronously connected power-generating units of the same underlying technology and any primary energy source, where they are collected together to form an economic unit towards the RSO and where they have a single connection point to the RSO, should be assessed based on the agreed maximum continuous active power export capacity at the point of connection, irrespective of their installed their aggregated capacity.</td>
<td>Disagree</td>
</tr>
<tr>
<td>Applicable NC</td>
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<tr>
<td>NC DC</td>
<td>VDE FNN</td>
<td>Article XX, Article 2 (new definition)</td>
<td>The stakeholder argues that the newly introduced mode (LFSM-UC) is too complex for heat pump both in operation and in verification. For VIG, the mode LFSM-UC is to be dimensioned stability-oriented in closed loop, for a stable behaviour. In operation with the interconnected system, such behaviour requires the provision of additional inertia to which the P(f) behaviour must be tuned. By shifting the LFDD-UC to the load, the need for stability-oriented sizing of the LFSM-UC and wide-area application of the LFDD is eliminated. Make sure that the concept of LFSM-UC is being used for large types of power-to-gas demand units.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>Verband der Automobilindustrie</td>
<td>Article XX</td>
<td>The stakeholder proposes to add “the actual consumption of active power frequency response in LFSM-UC mode shall be capable of taking into account, if applicable:  — ambient conditions when the response is triggered,  — the operating conditions of the V1G electric vehicle and connected electric vehicle supply equipment, in particular limitations on operation near maximum and minimum capacity allow frequencies and the respective impact of ambient conditions, and  — the need for consumption.”</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>Eurelectric</td>
<td>Article XX</td>
<td>The stakeholder argues that so far, FRT was only applicable to generators as described in the NC RfG. In NC RfG, the minimum level of Uret is 0.05. The Uret proposal for P2G is 0 which is very stringent. The technology used in P2G PCUs (power conversion units) is comparable with the technology of solar or wind turbine converters. Solar and wind turbine converters are capable of dealing with Uret of 0,05, but we are very concerned that these converters will not be able to cope with Uret = 0. Therefore, the stakeholders consider this requirement (Uret = 0 for P2G) as a real risk. They note that Uret = 0 is a more stringent requirement that the Uret requirement in NC RfG. The request for clarification as to why Uret = 0 is necessary for P2G and why it differs from NC RfG and from FRT requirements for V1G vehicles and associated V1G electric vehicle supply equipment.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>ACCIONA, AEE, Iberdrola</td>
<td>Article 14(3)(c)</td>
<td>The stakeholders propose to add the word “agreed” before connection point since, in Spain, there are connection points where multiple PGMs/PPMs are connected, sharing electrical infrastructure and commonly through long HV/MV connection lines up to the grid interface with the TSO/RSO. Therefore, the stakeholders consider that this requirement would not be possible to comply with and that there needs to be an exception on this kind of connection configurations, where the specific connection point (and verification of compliance point) of the PGMs/PPMs is agreed by the owner and the TSO/RSO (usually the HV side of the PPM main step-up transformer).</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>ACCIONA, AEE</td>
<td>Article 14(4)(c)</td>
<td>The stakeholders propose to add a sentence to this article as they consider that all connection agreements of PGMs/PPMs shall clearly define minimum short-circuit level. It is not the case in all Member States.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>E.ON</td>
<td>Article 14a(3)(b)</td>
<td>The stakeholder proposes that fault-ride-through capabilities in case of asymmetrical faults shall be specified by the relevant system operator, as asymmetrical errors in the transmission grid have hardly any effect on the subordinated voltage levels. Corresponding requirements should therefore be defined by the relevant system operator.</td>
<td>Disagree</td>
</tr>
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<td></td>
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<td>One of the general purposes of the NC RfG is that the system users' connection to the network is maintained during the system transients (thus voltage and frequency withstand capabilities) and not to disconnect them at randomised frequencies with long reconnection times because this latter will bring additional system operation problems following system transients. For example, if on a sunny day with lots of solar power plants operating in distribution network, the system loses a lot of consumption (heat-pumps, power-to-gas units, V1G EVs and associated EVSEs), overloads in distribution will occur and which in turn will have to be mitigated with disconnections of distributed RES. Similarly, after losing for a considerable time large sum of consumption units (10-60 minutes reconnection time was proposed by VDE, FNN) the frequency will experience a large overshoot which in turn will require the entire system to adapt. It could well be the case that this frequency overshoot would exceed the dimensioning incident in the Continental Europe Synchronous Area set at 3000 MW today. Which in turn, would lead to the need to activate emergency and restoration measures.</td>
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<td></td>
<td>In the coming years, a strong increase in new controllable demand facilities connected to the European high-voltage and extra-high-voltage grid is expected. For example, an expansion of electrolysis plants in the order of several hundreds of megawatts up to tens of gigawatts (target of by 2030) of reference capacity is expected to take place in the next few years. This makes it necessary for system security that electrolysis plants can ride through faults in the future (fault-ride-through). Due to the expected large size of these installations requirements similar to type D PGMs have been introduced.</td>
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### Summary of respondents’ response

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<tr>
<td>NC R1G</td>
<td>Enel Group</td>
<td>Article 14a(5)(c)</td>
<td>Disagree</td>
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<td></td>
<td>E.ON</td>
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<tr>
<td></td>
<td>EDP, Eurelectric</td>
<td>Article 14a(4)</td>
<td>Disagree</td>
</tr>
<tr>
<td></td>
<td>BDEW</td>
<td>Article 14a(5)</td>
<td>Partly agree</td>
</tr>
<tr>
<td></td>
<td>EDP, E-ReDES, Eurelectric</td>
<td>Recital (**), Article 2(1)</td>
<td>Disagree</td>
</tr>
<tr>
<td></td>
<td>Finnish Energy</td>
<td>Recital (**), Article 2(1)</td>
<td>Disagree</td>
</tr>
<tr>
<td></td>
<td>EDP, Eurelectric</td>
<td>Recital (8)</td>
<td>Disagree</td>
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<tr>
<td></td>
<td>EDP, Eurelectric</td>
<td>Recital (13)</td>
<td>Disagree</td>
</tr>
<tr>
<td></td>
<td>EDP, E-ReDES, Eurelectric</td>
<td>Recital (14)</td>
<td>Partly agree</td>
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</table>

The stakeholder considers that the grid security management of the grid operator ensures local grid security, the prerequisite is that a frequency control (active power adjustment) brings any benefit at all. The stakeholder suggests exchanging the order of paragraphs (iii) and (iv).

- **Partly agree**
  - ACER considers that details regarding the prior authorisation may be prescribed through the national regulatory framework.

The stakeholders propose to explicitly provide in point (b) that the relevant system operator should inform the operator of the charging point on the expected timeline of authorisation.

- **Partly agree**
  - The usage of sub-metering or DMDs is not excluded; however, further details may be provided in the national regulatory framework. Article 14a(5)(d)(ii) provides requirements for fault recording of V2G electrical charging parks. Therefore, it is important to keep the reactive power as one of the parameters to be recorded.

The stakeholder considers that, for the avoidance of doubt, it should be clarified in Article 14a(5)(d)(iii) that the requirements with regard to reactive power do not apply in the case that EV2 electric vehicles and or associated V2G electric vehicle supply equipment is connected in the V2G electrical charging park.

- **Partly agree**
  - NC DC provides for capabilities for demand units in order to support the electricity system following a disturbance. To that extend the home energy management system is another layer on top of the demand units and as such cannot provide these capabilities.

The stakeholder argues that it is strange to focus on certain technologies and there are numerous other products that will be produced that are not gases. The stakeholder suggests widening the scope and making the definition technology neutral.

- **Partly agree**
  - The recital covers the demand facilities, distribution systems and demand units that are subject of the NC DC, according to Article 1.

- **Disagree**
  - New types of demand units, such as V1G electric vehicle supply equipment, power-to-gas demand units and heat pumps, are expected to be connected to the electricity system in masse. Therefore, it is imperative that these new devices can support the system during network disturbances. Thus, ACER proposes the introduction of a new Article under a new Title in the NC DC on frequency and voltage-related requirements in order the reinforcement of the energy system, transforming during the green transition, be ensured.

- **Partly agree**
  - ACER proposed recital (**1) states that demand units are subject to the requirements of this Regulation regardless of whether they are part of an energy community as defined in Regulation (EU) 2019/943, another entity, or a form of system users’ aggregation.

The stakeholder proposes to complement “kept within reasonable limits” with “and proportional to the consumer size”.

- **Disagree**
  - NC DC differentiates demand units providing demand response services based on their voltage level at their connection point (below or above 1000V) and not on their size.

The stakeholder proposes to add after “agreement for a third party to take action on their behalf” the wording in parentheses “(individually or as part of an aggregation portfolio)”,

- **Disagree**
  - According to Article 3 of the NC DC, the scope of its application covers connection requirements for new transmission-connected demand facilities, new transmission-connected distribution facilities, new distribution systems, including new closed distribution systems, new demand units used by a demand facility or a closed distribution system to provide demand response services to relevant system operators and relevant TSOs, new V1G electric vehicles and associated V1G electric vehicle supply equipment, heat-pumps and power-to-gas demand units, with maximum consumption capacity of 68 kW or more at any voltage level. Other devices are out of scope.

The stakeholder proposes to add “or jeopardise the European electricity network system” at the end of the recital.

- **Partly agree**
  - The word “equipment” in this recital does not exclude network equipment.
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<tr>
<td>NC DC</td>
<td>Eurelectric</td>
<td>Article 1</td>
<td>As regards to 2(a)(b)(c)(d) – Rate of change of frequency and considering a “level playing field” among grid users, it is surprising that a VIG electric vehicle and associated VIG electric vehicle supply equipment, power-to-gas demand unit and heat-pump have to comply to these ROCOF requirements while other demand facilities do not have to comply to ROCOF requirements. The stakeholder inquires about the reasoning for this discrepancy.</td>
<td>New types of demand units, such as VIG electric vehicle supply equipment, power-to-gas demand units and heat pumps, are expected to be connected to the electricity system en masse. Therefore, it is imperative that these new devices can support the system during network disturbances. Thus, ACER proposes the introduction of a new Article under a new Title in the NC DC on frequency and voltage-related requirements in order to reinforce the energy system, transforming during the green transition, be ensured.</td>
</tr>
<tr>
<td>NC DC</td>
<td>EDP, Eurelectric</td>
<td>Article 2(12)</td>
<td>The stakeholders propose to delete the definition of “demand/ response transmission constraint management” as it not clear the difference between this type of demand response and the one defined in paragraph 16 (demand response active power control). Otherwise, a description highlighting the differences should be provided.</td>
<td>The definitions in Article 2(16) and (18) refer to the demand response services provided to system operators as stated in Article 27. ACER considers that these terms are adequately defined.</td>
</tr>
<tr>
<td>NC DC</td>
<td>EDP, E-REDES, Eurelectric</td>
<td>Article 2(18)</td>
<td>The stakeholders propose to delete the definition of “distribution systems” as it is not clear if the term covers only “on load tap changer” as the market already offers different solutions (after the transformer), for example, based on power electronics, to achieve the same objective.</td>
<td>The abbreviation P2G is not used in the NC DC.</td>
</tr>
<tr>
<td>NC DC</td>
<td>Undisclosed stakeholder</td>
<td>Article 2(*)</td>
<td>The stakeholder considers that there is a chance that the current definition of ‘power-to-gas unit’ is too vague and will not include the hydrogen productions converted to liquid fuels. Therefore, the stakeholder proposes to add a sentence as follows: This also includes units where electricity is converted to hydrogen that is ultimately converted to liquid fuels.</td>
<td>ACER considers that the currently proposed definition adequately defines the notion of a power-to-gas demand unit.</td>
</tr>
<tr>
<td>NC DC</td>
<td>E-REDES</td>
<td>Article 2(**)</td>
<td>The stakeholder proposes to include the abbreviation of power-to-gas demand unit – P2G – to the definition.</td>
<td>The abbreviation P2G is not used in the NC DC.</td>
</tr>
<tr>
<td>NC DC</td>
<td>EDP, E-REDES, Eurelectric</td>
<td>Article 3(1)(b)</td>
<td>The stakeholders argue that there is a need to clarify what constitutes a “(b) new transmission-connected distribution facility”. They also argue that although this definition is laid in the present version of the NC DC, it is not clear and creates different interpretations.</td>
<td>ACER considers that the wording is clear as the definition is given in Article 2(3): “Transmission-connected distribution facility” means a part of a distribution system connection or the electrical plant and equipment used at the site of the connection point to the transmission system.</td>
</tr>
<tr>
<td>NC DC</td>
<td>EDP, E-REDES, Eurelectric</td>
<td>Article 12(1), Article 13(1)</td>
<td>The stakeholders propose to change the wording “distribution systems” to “distribution systems assets managed by the DSO”, as in their view distribution systems is vague since it can also include the clients that are part of the distribution network. The DSO does not have control over the clients’ facilities.</td>
<td>Article 2(7) defines transmission-connected distribution system as a distribution system connected to a transmission system, including transmission-connected distribution facilities. Moreover, the notion of distribution system is used in the DIRECTIVE (EU) 2019/944.</td>
</tr>
<tr>
<td>NC DC</td>
<td>EDP, E-REDES, Eurelectric</td>
<td>Article 13(7)</td>
<td>The stakeholders propose to include DSO to agree on the voltage range, following the spirit of DC Regulation.</td>
<td>The relevant TSO shall specify the voltage range at the connection point that the distribution systems connected to that transmission system shall be designed to withstand.</td>
</tr>
<tr>
<td>NC DC</td>
<td>EDP, E-REDES</td>
<td>Article 15(2)</td>
<td>The stakeholders propose to delete “where applicable” in the second abstract of the paragraph, as it is not clearly defined.</td>
<td>ACER considers that it can be beneficial to leave certain level of discretion to allow for the consideration of local specificities.</td>
</tr>
<tr>
<td>NC DC</td>
<td>EDP, E-REDES, Eurelectric</td>
<td>Article 21(1)</td>
<td>The stakeholders propose to specify after “Transmission-connected demand facilities and transmission-connected distribution systems” the condition “if agreed between DSO and TSO”. They argue that the distribution network models are dependent on the behaviour of the clients connected to the distribution grid and currently there is no requirement for distribution grid client to provide the DSO with a model of its installation.</td>
<td>Article 2(2) of the NC DC states that each TSO may require simulation models or equivalent information showing the behaviour of the transmission-connected demand facility, or the transmission-connected distribution system, or both, in steady and dynamic states. Therefore, the ability to use equivalent information is provided. Furthermore, DSOs are in a position to be aware of the behaviour of their systems.</td>
</tr>
<tr>
<td>NC DC</td>
<td>EDP, E-REDES, Eurelectric</td>
<td>Article 27(1)(a), Article 28(1)</td>
<td>The stakeholders propose to delete the separate point on demand response transmission constraint management, arguing that there is no practical difference between this and demand response active power control. They suggest referring that demand response active power control can be used for constraint management services.</td>
<td>Demand response transmission constraint management is a service provided by the demand response units to the system operators to help the management of transmission constraints. Therefore, ACER does not consider appropriate to remove this service. Nevertheless, the upcoming amendments to the SO GL and/or Demand Response NC may revise the concerned provisions.</td>
</tr>
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<tr>
<td>NC DC</td>
<td>Undisclosed stakeholder</td>
<td>Article 27, Article 28, Article 29, Article 30</td>
<td>As regards the current differentiation of remotely controlled demand response services which could be provided to SDs, the stakeholder considers that transmission constraint management should be within the purview of TSOs. With regard to autonomously controlled demand response services, the stakeholder would like to simplify the existing categorisation, as frequency response services include very fast active power control. In addition, the stakeholder would like to underline that autonomously controlled demand response services can be delivered based on what can be measured, namely frequency control, voltage and current. To this end, the stakeholder suggests the introduction of a second category for system voltage control, which includes reactive power support. The above suggestions are aimed at attracting private investments which is needed to expand the pool of flexible, behind the meter assets which are able to decarbonise the grid at scale by providing demand response services. The stakeholder proposes to delete paragraph (1)(a)(ii). Additionally, the stakeholder considers that the delivery of demand response services should not be dependent on the existence of a third party for aggregation. Therefore, the stakeholder recommends to further simplify the rules by removing reference to a third party for aggregation purposes. In addition, the stakeholder is concerned that requirements in Article 29 may be overly restrictive, specifically with regards to measurement of actual system frequency and detection of a change in system frequency. Finally, the stakeholder is wondering why there are no wording for data recording.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>EDP, E-REDES, Eurelectric</td>
<td>Article 28(2)(k)</td>
<td>The stakeholders propose to establish that the common value for the RoCoF withstanding capability shall be proposed by ENTSO-E.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>EDP, E-REDES, Eurelectric</td>
<td>Article 32(1) and Article 32(6)(d)</td>
<td>The stakeholders propose to provide that, for the provision of demand response services, it is possible to qualify demand units not yet connected to the distribution network. The wording “within a demand facility or a closed distribution system connected” should be complemented with “or proposed to be connected”. It is also suggested to delete point (d) of paragraph 6, to consider demand units not yet connected.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>EDP, E-REDES</td>
<td>Article 49</td>
<td>The stakeholder proposes to change “unless agreed otherwise by the relevant TSO” to “unless agreed otherwise by the relevant system operators”, to include DSOs.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>EDP, E-REDES</td>
<td>Annex I</td>
<td>The stakeholders argue that frequency requirements must be the same for different synchronous areas and ENTSO-E has to be mandated to propose a uniform value by researching a consensus.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>EDF</td>
<td>Annex I</td>
<td>As is the case for the NC RIG proposal, the stakeholder states that no clear cost/benefit analysis was performed regarding the 51.5Hz-52.5Hz during 10s frequency requirement and asks for the removal of this requirement for all zones.</td>
<td>Disagree</td>
</tr>
</tbody>
</table>

Demand response transmission constraint management is a service provided by the demand response units to the system operators to help the management of transmission constraints. Therefore, ACER does not consider appropriate to remove this service. Furthermore, according to Articles 2(20) and 2(21), system frequency control is response to frequency fluctuations whereas very fast active power control aims to capture fast frequency deviations. In addition, according to Article 2(17) reactive power control, which is affecting the system voltage, is a service that is available for modulation by the relevant system operator, as they have complete view of the system voltages, and not to be autonomously controlled. Therefore, ACER does not deem appropriate to substitute the service for very fast active power control with system voltage control. Nevertheless, the upcoming amendments to the SQ GL and/ or Demand Response NC may revise the concerned provisions. There needs to be a third party since demand aggregation means a set of demand facilities or closed distribution systems which can operate as a single facility or closed distribution system for the purposes of offering one or more demand response services. Furthermore, the provisions in these articles are identical to the current NC DC and have been agreed with Member States. ACER does not see a need to change these provisions at this point.

It is up to the relevant TSO to specify the value for the RoCoF. ENTSO-E may publish an Implementation Guidance Document providing guidance regarding this value.

The provisions of Articles 31-33 of the NC DC describe procedures for connected demand units providing demand response services within a demand facility or a closed distribution system. There is no need to include demand units proposed to be connected as these units will eventually be connected in order to provide these services.

According to Article 48 of the NC DC it is the responsibility of the relevant TSO to undertake a quantitative cost-benefit analysis and to agree on the timeline for providing the necessary data.

The flexibility for TSOs to set different times for the frequency ranges should be retained. Minimum level of frequency stability of the European electricity system is achieved based on the defined minimum time periods.

When a system split is occurring, frequency in the overfrequency island can transiently overshoot before it is stabilised to a lower value. If, during that transient, all load is tripped due to transient over-frequency, the island will black out, even if it would have been possible to stabilise the frequency below 51.5 Hz. This system behaviour will be aggravated with decreasing system inertia. The proposed modification delays the tripping of load during the transient and therefore prevents the island from blacking out. Thus, system resilience increases. (see ENTSO-E’s submission to ACER’s 2022 Public Consultation on the amendments to the grid connection network codes).
### Summary of respondents’ response

#### NC DC

**Respondent:** IFIEC  
**Section:** General comment

The stakeholder considers that the specific topic of the discrepancy between NC DC (sites/CDSs and provisions applicable on their connection points) and NC RfG (installations and provisions applicable on the equipment) has not yet been addressed. The concern is expressed that a NC DC site can contain one or several installations falling under the NC RfG, which can directly lead to potential conflicts. E.g., under the NC RfG a PGM is requested to provide reactive power, while at the same time under NC DC the site where that PGM is based needs to remain between certain thresholds (maybe not succeeding to comply and then being exposed potentially to penalties).

To this regard, the stakeholder proposes to add an article to the NC DC (and/or NC RfG) stipulating that all requirements are only applicable insofar under NC RfG (or other codes, e.g., the future NC DSR) and no conflicting requirements are applicable, in which case the requirements under NC DC would only be applicable insofar taking into account those other required/requested actions.

<table>
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<tr>
<td>Partly agree</td>
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</table>

As regards the alleged discrepancy between the NC DC (sites/CDSs and provisions applicable on their connection points) and the NC RfG (installations and provisions applicable on the equipment), it is worth mentioning that the codes define connection requirements. Thus, as they both define ranges and capabilities, they should not be in conflict. The fundamental goal is to support the grid. For example, when there is an underfrequency event, the demand should reduce and the generation should increase within the site, thus all working at supporting the system to eventually recover the frequency back to the nominal value. As regards reactive power again the NC RfG and DC NCs define ranges and capabilities. Assuming there is only one connection point, then from the SO’s point of view they would like this connection point’s voltage to remain within the specified ranges from all equipment within the facility.

The amendment of Recital (9) of the NC RfG aimed at addressing the aggregation/bundling capacities of units of same underlying technologies to ensure the harmonisation of rules for mass-market products, it also to necessary to allow for hybridisation of power generating facilities. Therefore, ACER has amended Recital (9) of the NC RfG to ensure that these kinds of installations can properly be addressed. However, operational issues of the mixed customer site are out of scope of the connection codes as the scope of these codes is precisely defined. In any case whatsoever, these issues may be tackled within the national regulatory framework or within the connection agreement.

#### NC DC

**Respondent:** Undisclosed respondent, EHI  
**Section:** Article 59

The stakeholder proposes to set different grace periods for each application and scope, and gradually increase the number of devices equipped with functions. In addition, if launched models without the requirements are prohibited from being sold, significant switching costs are required. EHI further questions the timeline for the application and reiterates their position that any change in technical requirements forced on products requires a sufficiently long lead-time (e.g., 2-3 years) before becoming applicable.

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<td>Partly agree</td>
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Undoubtedly the European Commission will coordinate any grace periods and adoption related issues with Member States. Moreover, the adoption of the NC DC is expected in late 2024.
### 15. DEMONSTRATION OF COMPLIANCE

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<td>NC RfG and NC DC</td>
<td>EFAC</td>
<td>Recital (26) (NC RfG) Recital (17) (NC DC)</td>
<td>The stakeholder proposes to complement the recital with the following: “Setting up procedures for operational notification and compliance schemes including tests, simulations and the application of certificates will promote standardised grid connection and non-discriminatory access to the European market for manufacturers and project developers.”</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>ENTSO-E, CENELEC, COGEN Europe, EUGINE, EUROGEN, EUrTurbines, Moeller Operating Engineering GmbH</td>
<td>Article 2, Article 7, Article 29, new article in Title IV</td>
<td>The stakeholders propose to introduce a new article called “common provisions on equipment certificates” in the Chapter 1 “Compliance Monitoring” under Title IV “Compliance” with the motivation of: 1) The stakeholder states the need for specifying a compliance scheme, in case the RSO decides to use equipment certificates; 2) possibility of mutual recognition of equipment certificates between Member States; and 3) possibility of issuing certificates for power generating units or components that belong to a family. Apart from this new article, there is a need for new definitions related to certification process.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>EFAC</td>
<td>Article 2(46)</td>
<td>Based on EG HCF final report, the stakeholder suggests changing the definition of ‘authorised certifier’, to clarify that any authorized certifier issuing an equipment certificate shall hold a valid accreditation according to the international accreditation standard on product certification, i.e., ISO/IEC 17065. It was also proposed introducing the option for issuing equipment certificates “and/or” PGMD as not all authorised certifiers may issue both conformity statements but only one of these.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>EFAC</td>
<td>Article 2(47)</td>
<td>Based on EG HCF final report, the stakeholder proposes to clarify the definition of ‘equipment certificate’ that any equipment certificate issued under the regime of this Regulation is based on a certification scheme (as required by ISO/IEC 17065) according to the relevant standard (currently ISO/IEC 17067) and issued based on a conformity assessment with respect to specified requirements.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>KCORC, EFAC</td>
<td>Article 2 (new definitions)</td>
<td>The stakeholders propose to introduce new definitions on “power generating unit family” and “PGU Family”. One stakeholder (KCORC) proposes to define “PGU Family Certificate”. Another stakeholder (EFAC) also suggests providing definitions of ‘component’, ‘component family’, ‘compliance scheme’, ‘specified requirements’ and ‘statement of conformity’.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>KCORC</td>
<td>Article 3 (new paragraph)</td>
<td>The stakeholder proposes to add a new paragraph describing the power generating unit family and the conditions that need to be met to consider that a group of PGUs belongs to a specific family. The stakeholder argues that certification and family concepts are on PGU and not PGM level. PGU Family definition is missing in existing NC RfG and is essential for acceptance of PGU certification among EU countries.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG and NC DC</td>
<td>EFAC</td>
<td>Article 7 (new) (NC RfG) Article 6 (new) (NC DC)</td>
<td>The stakeholder proposes to introduce a new paragraph on the procedure for the provision of compliance schemes on national level – equivalent to the provisions on requirements of general application in paragraph (4).</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG and NC DC</td>
<td>EFAC</td>
<td>Article 29(2) (NC RfG) Article 31(4) (NC DC)</td>
<td>The stakeholder proposes to embed the compliance scheme into the operational notification process, providing that the compliance scheme shall address the use of equipment certificates of PGU and component.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>EFAC</td>
<td>Article 32(2)(d)</td>
<td>The stakeholder proposes to remove “in respect of power-generating modules” as equipment certificates, in general, are not issued in respect of a PGM. In general equipment certificates are issued for PGUs and component – however, here the final project characteristic as “in respect of a PGM” are not defined.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>EFAC</td>
<td>Article 32 (new)</td>
<td>The stakeholder proposes to introduce new paragraph 5 to enable that the consecutive scheme of EON, ION and FON may be also applied for type B and C PGMs, as this is the practise e.g., in Germany (Einzelneinschweisverfahren according to VDE AR N 4110).</td>
<td>Partly agree</td>
</tr>
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<tr>
<td>NC RfG</td>
<td>EFAC</td>
<td>Article 33 (new)</td>
<td>The stakeholder proposes to introduce a new paragraph 2 to enable that – equivalent to Article 32(4) the documentation may be checked by authorised certifiers (as in practise in Germany according to NELEV and VDE AR N 4120).</td>
<td>Partially agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>EFAC</td>
<td>Article 40(1)</td>
<td>The stakeholder proposes to delete the phrase “issued as per Regulation (EC) No. 765/2008” as that regulation only defines the accreditation of certification bodies but not the issuing of certificates; and the issuing of certificates can be sufficiently addressed by the amended definitions (46) and (47) and the new Article 22 as proposed by EG HCF.</td>
<td>Partially agree</td>
</tr>
<tr>
<td>NC RfG and NC DC</td>
<td>EFAC</td>
<td>New article after Article 43 (NC RfG) Article 36 (NC DC)</td>
<td>The stakeholder proposes to introduce a new article on common provisions on equipment certificates that would establish the general requirements and procedure.</td>
<td>Partially agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Undisclosed stakeholder</td>
<td>Article 40, Article 41</td>
<td>The stakeholder proposes to introduce a unique equipment certificate model in the EU for all types of power-generating modules in order to prevent market fragmentation. While PGMs of type C and D do not currently face the same regulatory barrier, the stakeholder would like to pre-empt future barriers for the uptake of such critical technologies which are able to manage the electricity grids more efficiently. Moreover, the stakeholder suggests that such certificates should be valid only when issued by European certification body located in the EU in order to ensure product safety. Indeed, often European certification bodies are located outside the EU territory, and in particular in countries with lower standards for product safety, such as the PRC. In addition, the stakeholder proposes to further amend this Article with a view to allow the verification of compliance with the NC RfG of PGMs through automated and automatic type testing of devices based on existing standards for installation. As a result, testing should only take place when the related devices are not installed according to such standardised type-testing procedures. This will limit SO discretion as much as possible and, in turn, promote investment to expand the pool of flexible, behind the meter assets that are needed to support high variable renewables grids.</td>
<td>Partially agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Undisclosed stakeholder</td>
<td>Article 42</td>
<td>The stakeholder considers that the introduction of additional requirements for compliance testing of power-generating modules could become too cumbersome where different national rules set out different requirements. The stakeholder proposes to amend this Article with a view to introduce requirements on compliance testing based on standardised type-testing procedures for any sites. Such procedures should include the power measurement of the concerned device and a demonstration of the connection with smart meters in order to guarantee that the device is not reexporting power to the grid, and/or the delivery of grid ancillary services.</td>
<td>Partially agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Undisclosed stakeholder</td>
<td>Article 43</td>
<td>The stakeholder considers that the introduction of additional requirements for compliance simulation of power-generating modules could become too cumbersome where different national rules set out different requirements. The stakeholder suggests amending this Article with a view to introduce requirements on compliance simulation based on standardised type-testing procedures for any sites. Such procedures should include the power measurement of the concerned device and a demonstration of the connection with smart meters in order to guarantee that the device is not reexporting power to the grid, and/or the delivery of grid ancillary services. In addition, the stakeholder proposes to further amend this Article to limit SO discretion to carry out compliance simulations as this could derail the market uptake of many flexible, behind the meter assets that are needed to support high variable renewables grid.</td>
<td>Partially agree</td>
</tr>
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<tr>
<td>NC RfG</td>
<td>VDE FNN, Bundesverband Solarwirtschaft e.V., AEE, Iberdrola, E.ON, Enel Group</td>
<td>Article 14(5)</td>
<td>The stakeholders argue that there must be a uniform interface for communication in Europe. Any agreements or contracts should be made solely between the facility owner and the relevant system operator. The communication protocol has to be set by the relevant system operator. Any data exchange to the TSO has to be agreed between the relevant system operator and the relevant TSO. Another stakeholder suggests that ACER should have the right to specify the real time interface after consultation with relevant stakeholders since there must be a uniform interface for communication in Europe. One stakeholder considers that the metering device and communication link should be defined. One stakeholder considers that the adoption of low latency communication network should be provided in (d)(i) and (d)(ii).</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>EDP, E-REDES, Eurelectric</td>
<td>Article 29(3)</td>
<td>The stakeholders propose to provide that the provision on the permanent decommissioning notification is also applicable to the existing power generation facilities.</td>
<td>Disagree</td>
</tr>
</tbody>
</table>

ACER views:
- The NC RfG should not provide for every detail. Reference could be made for example, to ENTSO-E’s Implementation Guidance Document on real-time data and communication which serves national implementation for network codes on grid connection. According to this document:
  - In order to create a seamless, efficient and secure information exchange it is necessary to apply harmonized standards at various stages, as the number of entities and/or parties is dramatically increased – TSOs, DSOs, RSO, Grid Users, Third party service providers etc.
  - The ENTSO-E recommended standards to be applied for market related and structural data exchange of information can be found on ENTSO-E website via the following link: https://www.entsoe.eu/major-projects/common-information-model/cim/Pages/default.aspx
  - Recommendations on applicable standards for information security and best practice on handling confidential information can be found in the IEC 62351, ETSI X.501 as well as the ISO27000 standard series. The global best practice recommended to be applied can be found in the following report: Smart Energy Grid – Coordination Group Cyber Security & Privacy, SEG-CG/CSP-Draft Report-V07.pdf
  - The communication protocol needs to respect the capabilities of the owner’s equipment; hence the owner’s agreement is important.
### 16. OTHER AREAS NOT COVERED BY THE POLICY PAPER EXPLICITLY

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<td>NC RfG</td>
<td>COGEN Europe</td>
<td>Article 3</td>
<td>The stakeholders propose to provide that the documents defining the requirements and verification of compliance should be made available in English. One stakeholder proposes that these should be available within three months of publication of the original document.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>Undisclosed stakeholder</td>
<td>Article 7, Article XX3</td>
<td>The stakeholder considers that as there are 39 different TSOs in the different Member States, having different requirements in different countries leads to an unclear situation and that obligations and Regulation should be fixed with harmonised standards within the European community.</td>
<td>Partially agree</td>
</tr>
<tr>
<td>NC DC</td>
<td>Undisclosed stakeholder</td>
<td>Article 27</td>
<td>The stakeholder considers that as chargers are brought to the market under a CE declaration, a harmonised standard for functions and interface is needed. (harmonised standard to be inserted in paragraph 3).</td>
<td>Partially agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>ENTSO-E</td>
<td>Article 16(3)(a)</td>
<td>The stakeholder argues that the FRT profile is less strict for type D installation connected below the 110 kV and does not go at Uret of zero. It is suggested changing this need because a large number of offshore projects are expected to be connected at 66kV, mainly DC connected. In the future, DC connected PPMs will have 66 kV connection point to the offshore HVDC platform, in scale 400-500MW. Therefore, the stakeholder considers that FRT shall be down to zero.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG and NC DC</td>
<td>ENTSO-E, Oesterreichs Energie</td>
<td>Article 13(2)(b), Article 13a(1)(b) (NC RfG), Article XX (NC DC)</td>
<td>The stakeholder generally agrees with ACER’s proposal. However, it was proposed to introduce some additional specifications to ensure that RoCoF assessment spursurious frequency measurements caused by distortion and transients. It is important that plants do not trip during faults/hasmine jumps due to RoCoF protection.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>VGBE, COGEN Europe, EUGINE, Eurelectric, EU-Turbine, Undisclosed stakeholder, Gunnar Kaeste, Energie-Nederland, EDF</td>
<td>Article 19(4)</td>
<td>The stakeholders do not support the exclusion of type D SPGMs based on the 400 MW capacity threshold. The RoCoF withstand capability is a major design parameter for power systems. One stakeholder proposes to allow a type D SPGM to apply for an exception to the relevant TSO from the 24h’s over a period of 0.6s requirement.</td>
<td>Partially agree</td>
</tr>
<tr>
<td>NC RfG</td>
<td>VGBE, COGEN Europe, EUGINE, Eurelectric, EU-Turbine, Undisclosed stakeholder, Gunnar Kaeste, Energie-Nederland, EDF</td>
<td>Article 13(2)(b), Article 19(4)</td>
<td>Some stakeholders propose to apply RoCoF of 1Hz/s for all SPGMs type D. It is not allowed to block investments due to this RoCoF requirement due to two major advantages of SPGMs: (i) saving CO2 emissions in cogeneration units and (ii) increasing the robustness of the electricity system by adding “real” inertia. Another stakeholder proposes that PGMs shall provide information on the maximum acceptable RoCoF withstand capability, with minimum withstand capability not less than 1/1Hz/s and for type D SPGMs RoCoF protection settings shall be agreed with Power Generating Facility Owner.</td>
<td>Partially agree</td>
</tr>
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<tr>
<td>NC RIG</td>
<td>IFIEC, National Grid, ESO</td>
<td>RoCoF, Article 13(2)(b)</td>
<td>One stakeholder expresses doubts regarding the proposed RoCoF and considers that the topic was not sufficiently studied to allow the incorporation of specific values and requirements in the Regulation. One stakeholder notes that the changes in the rate of change of frequency withstand capability are quite sensitive. The rate of change of frequency withstand capability will vary from synchronous area to synchronous area and the security standards that apply. Some TSOs may not have a system split condition in their security criteria, and, in this case, it is questionable whether such high rates of change of system frequency withstand are required. Also, there is a difference in the requirements between synchronous power generating modules and power park modules, so there is a risk that if high rates of change of frequency occurred in a synchronous area, the synchronous plant would trip first making it very difficult for the system to survive based on the remaining power park modules.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>ENTSO-E, WindEurope</td>
<td>Article 21(3), Article 26</td>
<td>The stakeholders propose a legal text for the forced oscillations requirement of PPGMs, starting from type C.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>VGBE</td>
<td>Article 24</td>
<td>The stakeholder proposes to improve the clarity of the text with regard to the references to other articles.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>VGBE, IFIEC</td>
<td>Article 60</td>
<td>The stakeholders propose to give ACER the authority to introduce a derogation at the level of the European Union, added to the existing national ones and persisting during the lifetime of the concerned PGMs.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>ENTSO-E</td>
<td>Article 70a</td>
<td>Recital 32, as given by the proposal of ACER should be included in Article 70a (Repeal), as it is not considered a transitional provision. Moreover, the wording is not precise enough regarding the modifications which makes the PGM fall within the scope of application of the regulation. For example, it is necessary to give more details for the case of new PGMs that will arrive after the entry into force of this regulation and before the date on which the requirements it provides begin to apply (to avoid that none of the NC apply to them). Introducing new requirements without specifying their temporal application (scope ratione temporis) entails the risk of legal uncertainty for PGMs, which existed already before the entry into force of the newly adopted regulation, due to its retroactive application.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RIG</td>
<td>ENTSO-E</td>
<td>Article 71a</td>
<td>The stakeholders proposes a reviewed legal text for the Article 71a in order to ensure clarity.</td>
<td>Partly agree</td>
</tr>
<tr>
<td>NC RIG and DC</td>
<td>EU DSO, EDF, E-REDIE, Eurelectric</td>
<td>Article 58 (NC RIG), Article 56 (NC DC)</td>
<td>The stakeholders propose that the ENTSO for Electricity shall, in co-ordination with the EU DSO Entity, prepare and thereafter every two years provide non-binding written guidance to its members and other system operators.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>ENTSO-E</td>
<td>Article 2(4)</td>
<td>The stakeholder considers that the part of the legal text proposal as “being part of a demand facility or part of a closed-distribution system,” is important to avoid legal ambiguity and misinterpretation for the applicability of the technical requirements.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>ENTSO-E, Undisclosed stakeholder</td>
<td>New paragraph in Article (2), Article 3, Title XX</td>
<td>One stakeholder proposes to add a definition for data centre demand units in the definitions of NC DC and to introduce technical requirements for these units. Another stakeholder shares the interest in defining requirements for a certain number of new uses (V1G, heat pumps, power to gas units). However, other technologies representing an increasingly significant share of consumption and being technologically capable of meeting similar requirements such as data centres could logically also be included in the scope of the NC DC. The stakeholder considers that further justification is necessary for this partial broadening of the scope of application of the NC DC.</td>
<td>Disagree</td>
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<td>NC DC</td>
<td>ENTSO-E</td>
<td>Article 1(1), Article 19</td>
<td>The stakeholder proposes to add a new point in the subject matter, namely, “distribution-connected demand facilities, if specified by the relevant TSO, in coordination with the relevant system operators, to provide demand disconnection and reconnection.”</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>ENTSO-E</td>
<td>Article 6(7)</td>
<td>The stakeholder proposes to remove the provision that relevant regulatory authority or designated entity can also deem an amendment necessary, allowing regulatory authorities to propose an amendment.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>ENTSO-E</td>
<td>Article XX</td>
<td>The stakeholder proposes to add a requirement on HVRT to avoid mass disconnection of large-scale power to gas demand facilities due to grid disturbances. This is an important requirement together with the FRT.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC DC</td>
<td>ENTSO-E</td>
<td>Article XX</td>
<td>The stakeholder argues that power-to-gas is foreseen to represent several GW in a very restricted geographical area. A fault could then impact GW of load whose behaviour could impact drastically the stability of close generators as well as the system frequency. The recovery after fault should be discussed between TSO and P2G facility owner in order to address this risk. For France for example, we could have to delay the active power recovery of hundreds of ms after voltage recovery to improve transient stability of close nuclear power plants. However, a recovery of 5s could be too long and lead to LFQS-activation, which is perhaps not intended for normal faults. A recovery ramp of active power after voltages recovery could be better than just a time recovery. The line should allow these discussions and set only maximum tolerable values. For Germany the time for active power recovery is much too long for the requirements in the German grid.</td>
<td>Disagree</td>
</tr>
<tr>
<td>NC DC</td>
<td>T&amp;D Europe</td>
<td>Recital 7, Article 2(21), (22)</td>
<td>The stakeholder argues that the term ‘demand response’ is used as these codes do not consider the demand facility, demand unit to be comprised of any generation source. They suggest demand response be replaced by demand side flexibility. As the latter covers more granular control strategies to make demand elastic, irrespective of whether there is a generation unit or not.</td>
<td>Agree</td>
</tr>
<tr>
<td>NC DC</td>
<td>T&amp;D Europe</td>
<td>Articles 1(1)(e) and 3(1)(e)</td>
<td>As regards V1G electric vehicles and associated V1G electric vehicle supply equipment, heat pumps and power-to-gas demand units, the stakeholder suggests treating these new demand facilities not separately from other demand units. Especially if these new demand units are part of a demand facility, the requirements from the NC DC should apply to the grid connection of this demand facility and it is subject to the energy management within the demand facility to fulfill these requirements utilising the available capability of all controlled demand units, even if these demand unit standalone would not meet the NC DC requirement. Therefore, a merger of points (d) and (e) of Article 1 is proposed and apply this throughout the legal text.</td>
<td>Disagree</td>
</tr>
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ACER agrees with the addition of HVRT provision for power-to-gas demand units to improve the robustness of the system. Relevant amendments have been introduced in the NC DC.
17. **NEXT STEPS**

Following the evaluation of the stakeholders’ responses to the 2023 public consultation, ACER plans to submit recommendations for the amendments of the NC RfG and NC DC to the Commission by the end of 2023.