

All TSOs' proposals for the Policy on Load Frequency Control and Reserves (LFCR) of the Synchronous Area Framework Agreement in accordance with Article 118 of Commission Regulation (EU) 2017/1485 of 2 August 2017 establishing a Guideline on Electricity Transmission System Operation:

- Article A-1 pursuant to Article 118 paragraph 1 (a) the dimensioning rules for FCR in accordance with Article 153.
- Article A-2 pursuant to Article 118 paragraph 1 (b) additional properties of FCR in accordance with Article 154(2).
- Article A-5 pursuant to Article 118 paragraph 1 (z) the methodology to determine limits on the amount of exchange of FRR between synchronous areas defined in accordance with Article 176(1) and the methodology to determine limits on the amount of sharing of FRR between synchronous areas defined in accordance with Article 177(1).
- Article A-6 pursuant to Article 118 paragraph 1 (aa) the methodology to determine limits on the amount of exchange of RR between synchronous areas defined in accordance with Article 178(1) and the methodology to determine limits on the amount of sharing of RR between synchronous areas defined in accordance with Article 179(1).

Response to public consultation comments received during the consultation held 30 March – 03 May 2018.

Remarks:

- (i) identical comments from different stakeholders have been grouped where possible, to improve the readability;
- (ii) the references to the articles and paragraphs are based on the versions of the proposals that were submitted to public consultation (see the [consultation](#) at ENTSO-E consultation hub).

No	Article	Specified Article	Comment/ Suggestion	Change in Article yes/no	Response	Reviewer affiliation
1	A-1	3	EDF considers that this article does not require any change or clarification. EDF agrees with the FCR dimensioning for the synchronous area Continental Europe in positive and negative direction to be equal to the reference incident of 3000 MW, according to SO GL article 153(2b.i) and as stated in Article 3 of Article A1 FCR Dimensioning. EDF also agrees with the shares of the reserve capacity on FCR required for each TSO, as defined in Article 3 of Article A1 FCR Dimensioning.	No	Thank you very much for your comment. Your input is noted.	EDF
2	A-1	3	<p>The proposed Article prescribes in Article 3 “The FCR dimensioning for the synchronous area Continental Europe in positive and negative direction is equal to the reference incident of 3000 MW, according to SO GL article 153(2b.i)”. However, the reference incident is defined as the maximum expected instantaneous power deviation between generation and demand in the synchronous area for which the dynamic behavior of the system is designed. This expected instantaneous power deviation includes the losses of the largest power generation modules or loads, loss of a line sector or a bus bar, or loss of a HVDC interconnector.</p> <p>According to ENGIE, it is necessary to change this article in order to add the definition of the reference incident. Setting the reference incident for Continental Europe to 3000 MW in both directions is not satisfying since the production units may change over the years (for instance, with the commissioning of the largest Nuclear Power Plant in France, or the increasing amount of wind production in the North Sea).</p> <p>ENGIE notes that the Article does not retain the option to use the probabilistic approach. ENGIE strongly disagrees that the absence of incidents in the recent past is a reassurance for the future. ENGIE asks ENTSOE to clarify its position, and to define a time schedule to implement the probabilistic approach.</p>	No	The reference incident is currently defined as 3.000 MW in Article 153 (2)(b)(i) SO GL, a change of this parameter is not possible. A definition of reference incident is not needed, since it is described in SO GL.	ENGIE

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3	A-2	Whereas (3)	<p>The Whereas (3) is in our opinion not complete. The last sentence of GL SO Art. 154.2 was not inserted in this text of the Whereas. With respect to Article 154 of SO GL which determines only FCR technical minimum requirements, all TSOs of a synchronous area have the right to specify, in the synchronous area operational agreement, common additional properties of the FCR required to ensure operational security in the synchronous area, by means of a set of technical parameters AND within the ranges in Article 15(2)(d) of COMMISSION REGULATION (EU) 2016/631 of 14 April 2016 establishing a network code on requirements for grid connection of generators and Articles 27 and 28 of COMMISSION REGULATION (EU) 2016/1388 of 17 August 2016 establishing a Network Code on demand connection. TO BE COMPLETED WITH :” The TSOs shall apply a transitional period for the introduction of additional properties, defined in consultation with the affected FCR providers. In this document, nothing is mentioned about this obligation. It has to be adapted by insertion of this obligation Also in this document the meaning the wording “AND” of Art.154.2 of GL SO is not respected.</p>	Yes	<p>Comment acknowledged. The proposed transitional period has been considered and defined in <i>Article 4 Publication and Implementation</i> accordingly to enable proper adaptation.</p>	VBG
4	A-2	General statement regarding whole article	<p>We request all TSOs to justify the provisions’ necessity and proportionality, especially in case of retrospective application of requirements.</p> <p>We also request all TSOs to consider the legal consistency in the setting of the methodology by respecting the SO GL and RfG scopes. It is not the purpose of any deliverable resulting from the application of SO GL to impose any requirements in terms of constructive capabilities. For legal consistency, any deliverable developed under SO GL should only deal with the operation of the system, strictly in the respect of either the declared constructive capabilities for the existing units/groups or of the RfG requirements for new units.</p> <p>If all TSOs assess it is necessary to apply the article 154 for setting new requirements to existing units, it can only be done after a clear justification for the necessity and proportionality of such provision. This justification should provide evidence that the solution proposed is the optimal one – and both necessary and proportionate - whether the</p>	<p>No in general Yes in details</p>	<p>The legal consistency between SO GL and RfG has been checked.</p> <p>It is in particular important to notice that:</p> <ul style="list-style-type: none"> <li>- RfG does not prevent to establish additional FCR properties for other production units than mentioned in Art. 15 RfG (Type C and D production modules).</li> <li>- As long as the requirements set in Table 4 of RfG can technically be applied to other units than Type C and D and at the same time that application does not affect compliance to Art. 13 RfG by the relevant units, there is no inconsistency.</li> </ul>	Eurelectric

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			<p>requirement proposed is copy/pasted from RfG, whether it is “within the range” of RfG requirements as described in article 154, or whether there is no real additional need requested.</p>		<ul style="list-style-type: none"> <li>- Article 154(6) imposes an obligation on all FCR providing units, both new and existing, to be able to activate FCR within the frequency ranges defined in Article 13(1) RfG, nevertheless the respective time periods have to be determined by the TSOs taking into account the technical boundary conditions of the respective FCR providing units or FCR groups.</li> <li>- In order to comply with EB GL as well, all additional FCR Properties should be applied for any FCR delivering production units, existing and newly connected, in a non-discriminatory way and should ensure to create a level playing field for all FCR providing producers,</li> <li>- FCR properties that do not result from RfG, should be included as additional properties as long as they are necessary and applied in a non-discriminatory way and not conflicting with RfG requirements.</li> </ul>	

No	Article	Specified Article	Comment/ Suggestion	Change in Article yes/no	Response	Reviewer affiliation
5	A-2	General statement regarding whole article	<p>ENGIE appreciates the consultation on the Synchronous Area Operational Agreement proposal. We are in favor of a market as large and diversified as possible in order that FCR need could be provided in an optimum way. As a consequence, according to ENGIE, the minimum technical requirements for FCR product shall stay as standard as possible. However, if TSOs assess that the current standard properties for frequency containment reserves do not meet the operational security in the synchronous area, then the additional requirements have to be defined in consultation with the affected FCR providers, and, if it is not possible, TSO shall specify the requirements for an additional standard product that matches their needs, on top of the FCR volumes. In addition to the Eurelectric answer, that ENGIE fully supports, we submit the following comments.</p> <p>Article 154.2 of the SOGL specifies that : “All TSOs of a synchronous area shall have the right to specify, in the synchronous area operational agreement, common additional properties of the FCR required to ensure operational security in the synchronous area, by means of a set of technical parameters” and “within the ranges in Article 15(2)(d) of Regulation (EU) 2016/631 and Articles 27 and 28 of Regulation (EU) 2016/1388. Those common additional properties of FCR shall take into account the installed capacity, structure and pattern of consumption and generation of the synchronous area. The TSOs shall apply a transitional period for the introduction of additional properties, defined in consultation with the affected FCR providers.” Which means that:</p> <ul style="list-style-type: none"> <li>• The additional requirement have to ensure operational security.</li> <li>• Those additional requirements have to be within the ranges defined in Article 15(2)(d) of the RfG NC</li> <li>• Those additional requirements have to be defined in consultation with the affected FCR providers during a transitional period.</li> </ul>	Yes	<p>Additional Properties have been defined based on operational experiences and to ensure operational security also going forward.</p> <p>It is the intention to define requirements which do not need individual interpretation. We tried to consider the comments as far as possible (e.g. transitional period).</p> <p>For further details please refer to the response to comment No 4.</p>	ENGIE
6	A-2	General statement regarding whole article	<p>No alternative wording on this article but a comment in relation to it and the general basic remark described in questions n° 6 to 10 "A2-additional properties of FCR". The choice of keeping 3000MW as an incidental reference and as a need for FCR volume should not mean that ENTSOE also needs to specify new requirements that are more</p>	Yes	<p>There is probably a misunderstanding concerning the scope of RfG and SO GL. According to Article 2 (1)(e) SO GL, the rules and requirements of SO GL are applicable to active power providing</p>	Compagnie Nationale du Rhône (CNR)

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			<p>restrictive but, above all, retroactive for existing plants (which have historically proved their worth), bringing them to no longer have ability. The impact of the proposals of the consultation and link with SO GL brings concretely in the case of run of river hydros existing of the National Company of the Rhone to remove them from the factory with ability (because not being able to be totally rebuilt at the equipment level). This is not acceptable especially since the debate and the transposition of the Rfg code validated that the new requirements only apply to new units and that existing units were defined in the context of past requirements (excluding substantial changes)</p>		<p>units, whereas RfG gives basic requirements for new units, which have to be fulfilled as preconditions for connection. These RfG requirements should not be mixed up with conditions for prequalification of reserves, which are procured to safeguard operational security.</p> <p>However the requirements proposed do in principle not go beyond the existing Policy 1 and in addition a transitional period has been defined to enable proper adaptation of existing providing units where necessary.</p> <p>The reference to RfG does no longer exist in the Article.</p> <p>Nevertheless, the requirements were adapted as far as possible to take the comments into account.</p>	
7	A-2	General statement regarding whole article	<p>In the past, almost all FCR supplying units were not coherent with the wide frequency ranges and durations imposed by RfG NC for NEW units and FCR has worked perfectly over the last 10 years and more. So experience has proved that no correlation exists between the two sets of requirements.</p> <p>By stipulating those additional requirements, ENTSOE is imposing the RfG NC on existing units.</p> <p>Such retrospective action on existing units has never been the intention of and was never allowed by the European Commission.</p> <p>VGB proposes to delete Art.3.2 of this document.</p>	Yes	Please refer to answer of comment No. 6.	VGB

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8	A-2	General statement regarding whole article	<p>First of all, and as a general principle, EDF considers that using provisions from RfG and extending their application without due justification, to existing units under SOGL is not acceptable (please see answer to Q7).</p> <p>Here, this article introduces, precisely with the sentence 'shall rise linearly or quicker', an additional requirement, in terms of constructive capabilities, that goes even beyond the provisions of the Network Code Requirement for Generators' (RfG), since the latter only requires two parameters in terms of dynamic performances: the initial delay and the time for full activation (respectively t1 &amp; t2 in Figure 6 of article 15 of the RfG - see hereunder). Furthermore without any due justification, this requirement is justified neither for new units, nor for existing ones.</p> <p>EDF would however like to underline that this Policy 1 document could be the opportunity to serve the purpose of harmonization for Frequency Sensitive Mode (FSM) requirements in operation. In fact, the RfG code left a lot of FSM requirements as non-exhaustive (to be defined at national level within a predefined range). Setting for operation strictly the same value for these FSM requirements (see IGD on FSM, in particular the droop) would ensure a level-playing field at European level (see the position paper presented in GC -European Stakeholder Committee on 09/12/2016).</p> <p>In summary, EDF considers that this paragraph, under the current circumstances and lack of justifications, should be removed.</p> <p>In conclusion, EDF recalls any deliverable developed under SOGL should only deal with the operation of the system, strictly in the respect of either the declared constructive capabilities for the existing units/groups or of the RfG requirements for new ones. If ENTSO-E wants to apply the article 154 from SO GL (FCR technical minimum requirements) for setting new requirements to existing units, this can by no means be done by copy/pasting some RfG requirements.</p> <p>Considering all the above, EDF believes that there is currently no justification underpinning the TSOs' proposal. In any case, CBA or detailed justification should provide evidence that the solution proposed is the optimal one – and both necessary and proportionate.</p>	No in general Yes in details	Please refer to answer of comment No.4 and No. 6.	EDF

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			<p>From a technical point of view, this requirement would lead to only two solutions for all existing FCR providing units/groups that are not compliant with this requirement: either a retrospective application of the requirement, or no more possibility to participate to FCR services. The upgrade for some of these units could prove difficult or even impossible due to technical constraints. Moreover, there is absolutely no link between FCR capability and this requirement: indeed, many existing units/groups have been capable of providing frequency sensitive mode (FSM) for many years, without the capability to withstand unlimited time at 51Hz, for example.</p> <p>As a consequence, imposing such a requirement would lower the liquidity for this product, and as a result would most probably increase the cost for the system and in the end for consumers.</p> <p>In summary, EDF considers that this paragraph, under the current circumstances and lack of justifications, should be removed.</p>			

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9	A-2	General statement regarding whole article	<p>Note below [1] valid for the various questions on the requested requirements and the SO GL interpretation of section 154 in particular. As part of the general remark made in question 5 above we can not accept that the articles described in this consultation and the interpretation of SO GL require retroactive application of the new requirements on existing units with the impact of inaptitude of our existing units that have proven themselves in the past. And all the more so since the debates and the transposition of the Rfg code have clearly defined that the new requirements are only necessary for new installations. The existing facilities (excluding substantial modifications) retained the past requirements and their past capacity. This fundamental remark (with very high stakes and impact: losses of existing facilities such as that of the CNR without real justifications and after historical investment and a impossibility of modification on the part of an impact of the global equipment of the plant) is the one we ask to study for all the following questions of the consultation and on the application of the SOGL code article 154 and especially for the remark at the end of the text (identified [2]). Thank you</p> <p>We ask you to take into account the consistency of texts and perimeters between SO GL and RfG. The purpose of the SO GL application is not to impose requirements in terms of constructive capabilities. SO GL should only deal with the operation of the system, the constructive capabilities are and have been dealt with in the Rfg for new units. For existing units the requirements remain those declared and in accordance with the historical test requirements. For the operation of the system it is not normal that SO GL imposes a deletion of existing capable facilities that have perfectly fulfilled their role previously.</p> <p>Moreover, the answers and numerical requirements requested or on particular tests can not be in the context of hydraulic power plant and particularly old existing (or it is not possible to renovate everything) to be of the same order as units with power electronics. The mechanics, the hydraulic effects (of water on the blades, of the hydraulics on the maneuvering organs, of safety, etc ...) on old installations are not the</p>	Yes	Please refer to answer of comment No.4 and No. 6.	Compagnie Nationale du Rhône (CNR)

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			<p>same as for new units equipped with electronics of power or the response can be instantaneous and perfectly enslaved to the second without connection with important mechanical organs or fluid maneuvering in an open environment. This context impacts all of our run of river hydros.</p> <p>End note [1]</p> <p>IMPORTANT [2]: On the other hand, with regard to the increase part of the linear response (15s and 30s) and the link with Article 154 SO GL (response under step of +/- 200mHz), nothing is formalized for the proper taking into account of existing and old units of the hydraulic type if they maintain well the dynamics of variation expected on a variation of frequency induced by the loss of 3000MW (profile of frequency of -800mHz with -200mHz with 15s and 30s). This failure to take into account the requirements of existing hydraulic type plants with derived regulation and existing regulation that is in line with the safety of the system, impacts the ability of the existing plants and our remark [1] with the disappearance of our existing plants.</p> <p>We ask you that it can actually have a remark allowing the proper taking into account of this existing for the power plants of this type which bring a perfect setting for the security of system as it has always been done and in accordance with past requirements.</p> <p>We can understand that the formalism is described particularly for new power plants or power electronics but as described in [1] it does not allow to take into account the existing that works correctly. SO GL has to deal with the operation of the system but not with the technical construction requirements, all the more new and retroactive in detailed hypotheses not adapted for old hydraulic factories. The Rfg code was there to discuss and validate the different control sheets for new installations while maintaining the previous requirements for old installations. The consequence would be the disappearance of our existing hydropower renewable water plants (run of river) which are currently fully physically participating (and were able to demonstrate this during the 2006 incident) and in the liquidity of the market and whose maintenance is continuing to maintain quality service.</p>			

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10	A-2	General statement regarding whole article	<p>Each TSO shall ensure that each FCR providing unit stays connected to the grid within the frequency ranges specified for an unlimited time period in Article 13(1) of Commission Regulation (EU) 2016/631 and has to take into account possible under frequency load shedding actions of the relevant system operators which might include also FCR providing units. If frequency deviation exceed above specified frequency ranges FCR providing unit or FCR providing groups should continue the operation and provide FCR further, according to the technical capabilities and national requirements.</p> <p>Explanation:            The proposed frequency ranges are based on the NC RfG requirements, are foreseen in principle for NEW PGMs. Through the above provision in the proposal for additional properties of FCR, the requirement for NEW PGMs is transferred to the existing entities providing the FCR service, omitting the procedure specified in Article 4(3) NC RfG (e.g. Cost-Benefit Analysis, Public Consultation). The required frequency ranges below 49.0 Hz and operating times are not consistent with the current national requirements (Polish Grid Code) and the technical capabilities of the existing conventional generation units which are main FCR providers in Polish Power System. Maintaining the provisions proposed by ENTSOE could result that exist FCR providers will be classified as not meeting European requirements. Therefore they will be forced for adaptation, which would result in significant unreasonable cost for PGMs owners, even if the differences between new frequency range vs time requirements and existing capabilities are not significant (influence on the security of the system is not essential and this issue could be neglected from this perspective). This change is all the more justified as the problem may concern not only the Polish power system, but it may affect other countries of continental Europe because frequency ranges haven't been unify so far within continental Europe and new values from NC RfG deviate from technical standards.</p>	Yes	Please refer to answer of comment No.4 and No.6.	Polish Power Transmission and Distribution Association

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11	A-2	General statement regarding whole article	<p>We believe the Article shall be clarified, as in current wording it would lead to application of RfG code to all generators, even to existing ones. RfG requires application to new or modernised generating units only, this Article thus goes behind the RfG application and is disproportionate.</p> <p>We believe this is a mere wording issue and we hope it will be addressed in the final proposal for NRAs.</p> <p>We would also like to support the position of our association eurelectric regarding all paragraphs of Article 3 of All CE TSOs' proposal for additional properties of FCR.</p>	Yes	Please refer to answer of comment No.4 and No.6.	CEZ Group
12	A-2	General statement regarding whole article	<p>This article leads to a retrospective application of frequency ranges of RfG to, inter alia, all generating units which provide FCR, including existing ones. Still, the application of RfG to existing units was excluded during the drafting phase of this code. The retrospective application of any requirement of RfG must be justified in particular by a Cost-Benefit Analysis.</p>	Yes	Please refer to answer of comment No.4 and No.6.	Eurelectric
13	A-2	General statement regarding whole article	<p>This requirement is based on 'constructive capabilities' as defined in RfG. EDF would like to recall that the "frequency ranges specified in Article 13(1) of Commission Regulation (EU) 2016/631" (as well as the overall RfG code requirements) apply to new generation units and not to existing units unless specific cases that are :</p> <p>(i) retrospective application on TSOs' call, due to major changes in system operation, and subject to cost-benefit analysis ;</p> <p>(ii) modification of the unit on generators' call requiring a substantial modification of the connection agreement.</p> <p>Therefore, if the operation leads to require specific capabilities, including for existing units, this has to be transparently identified/established and justified notably through a cost-benefit analysis. By no means can a simple reference to RfG extend the scope of requirements to existing units.</p> <p>Furthermore, EDF considers that this requirement appears to be in contradiction with the result of the discussions that occurred, during the drafting phases of both RfG and SOGL:</p> <p>(i) regarding whether RfG should apply to existing units or not: the conclusion was that existing units are not in the scope of RfG (except in</p>	Yes	Please refer to answer of comment No.4 and No.6.	EDF

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			<p>the cases mentioned above) ;</p> <p>(ii) for the SOGL, about the fact that any reference to RfG should only apply to those units in the scope of the RfG, and otherwise for existing units to the extent of their present capabilities declared to the TSO.</p> <p>[Third] This requirement also appears to be in contradiction with the SOGL/Art. 127(9) according which 'All TSOs shall endeavour to comply with the values for the frequency quality defining parameters or for the frequency quality target parameter [Annex III].' In fact, generators already questioned the consistency between these SO frequency quality parameters (in particular 'Standard frequency range' of +/- 50 mHz) and the constructive capabilities required by RfG (in particular, unlimited period for range of +/- 1000 mHz) for new units, while an uncertainty remains on the speed and the extend of development of generation connected through power electronics.</p>			
14	A-2	General statement regarding whole article	<p>ENGIE supports the answer written by Eurelectric. Moreover we note that no legal basis exists for the proposal of ENTSOE since the frequency ranges and durations imposed in this sentence to Power Generating Modules are not imposed by Article 15(2)(d) of the RfG NC.</p>	Yes	Please refer to answer of comment No.4 and No.6.	ENGIE
15	A-2	3(1)	<p>This article introduces an additional requirement/constraint in terms of constructive capabilities. The provision goes beyond RfG since RfG only requires 2 parameters in terms of dynamic performances (t1 &amp; t2, Fig. 6). eurelectric calls for justification of this new requirement.</p> <p>Moreover, ENTSO-E doesn't even harmonise the way constructive capabilities of RfG (many of them being non-exhaustive) are used in operation, at least during FCR procurement: yet, the present consultation could be a good opportunity to reach more harmonisation. In article 3.1, the wording "the activation shall rise linearly <u>or quicker</u>" even risks to decrease the harmonisation again.</p>	Yes	<p>For the first paragraph please refer to answers of comments No.4 and No. 6.</p> <p>Harmonisation is indeed a goal for A-2. Since e.g. required activation within the first 15 seconds has not been determined yet, Article 3(1) requires a minimum activation behaviour considering the fact that strict linear activation is not possible for all technologies.</p>	Eurelectric

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16	A-2	3(1)	<p>Energy Pool A clarification is required to define precisely the performance criteria attached to this 2 seconds. For example, has the FCR unit / group to reach a percentage of the committed Power in 2s ? And how the two seconds maximum response time are measured.</p> <p>In addition, we warn that in some pooling aggregation configuration, we may face technical limitations (telecom response time) to dispatch and to execute the appropriate instruction orders within this 2s.</p>	Yes	<p>The reaction-time has been estimated taking into account the current state of technology and the needs of operational security in terms of frequency stability. Since frequency changes very quickly due to a system imbalance and adequate response time of FCR is indispensable the purpose of this rule is to ensure sufficiently quick reaction of the FCR providing units. In particular activation shall start (i.e. a change in active power output is measured) at the latest 2 seconds after occurrence of the frequency deviation. Moreover the activation shall follow at least a linear shape (but can, of course, be quicker). After 15 seconds 50% of the total FCR has to be activated, after 30 seconds 100% according to Article 154(7) of SO GL.</p> <p>The requirement will be checked as part of the prequalification process for providing units by the connecting TSO.</p>	Energy Pool
17	A-2	3(1)	<p>This article needs a clarification as to how the 2 seconds delay for activation is calculated. It should be considered, for FCR providing groups, to be from when the frequency deviation is measured for the pool of assets, to when the first of any of the distributed resources that make the FCR providing group starts activation with some gradients. While 2 seconds is demanding, and the wording seems to allow to go beyond, it should not exceed 5 seconds.</p> <p>This requirement for linearity could bias the competition between stand alone FCR providing units and FCR proving groups made of multiple units. Thus the following sentence could be added "If the activation of active power frequency response cannot be linear, the power generating facility owner shall provide technical evidence</p>	Yes	<p>Please refer to answer of comment No. 16.</p>	NUVVE

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			demonstrating why the rise cannot be linear and what shape it would be”.			
18	A-2	3(1)	<p>It is important to make sure that FCR reacts in a timely manner and can cope with sudden frequency deviations. In that sense smartEn supports a maximum delay in activation time of 5 seconds, but some clarifications and exemptions are needed concerning the 2 second delay.</p> <p>Most importantly, clarifications are needed on how these 2 seconds are calculated. The approach must not discriminate against FCR providing groups that comprise multiple even hundreds or thousands of decentralised assets, as opposed to standalone FCR providing units. Since the communication with distributed assets might take up additional time (1 or 2 seconds more), we recommend having a derogation for some types of assets on this rule, as long as they are able to react under the 5 second maximum. This would avoid discriminating against certain technologies and business models.</p> <p>Further clarifications are needed also on what is meant by “technical evidence” when providing reasons for a greater than two seconds activation. The term “technical evidence” should be replaced by clear requirements on when it is possible to have a longer delay in activation time.</p> <p>Finally, the term “owner” is also not clear in this context. The “pre-qualifying party” should be the one responsible to provide the technical evidence or to comply with the requirements. smartEn proposes the following sentence to be added to clarify this point: “If the activation of active power frequency response cannot be linear, the power generating facility owner shall provide technical evidence demonstrating why the rise cannot be linear and what shape it would be”.</p>	Yes	Please refer to answer of comment No. 16.	smartEn
19	A-2	3(1)	We agree that 2 seconds are a plausible interval and that a quicker-than-linear response should be allowed. We feel that the quick response of batteries should also be acknowledged, when conceptualizing the FCR response system of the future. In this regard, the frequency response should be studied for the case of provision of FCR from batteries and the effect of such a case on the FCR dimensioning and frequency containment dynamics should be	No	Thank you very much for this comment. The TSOs are aware of the fact that activation of inverter connected units will probably be much quicker than that of conventional units and some studies with batteries are in progress.	DSOs

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			investigated by the TSOs.			
20	A-2	3(2)	Each TSO shall ensure that each FCR providing unit stays connected to the grid within the frequency ranges specified in Article 13(1) of Commission Regulation (EU) 2016/631 as long as possible and at least according to the minimum time periods of operation according to same regulation and.... This is a violation of the wording “AND” of Art.154.2 GL SO (see in the “Whereas” above).The frequency ranges and durations of PGMS have no relationship with the characteristics of FCR described in Art.15.2.d of RfG NC.	Yes	Please refer to answers of comment No.4 and No.6.	VGB
21	A-2	3(2)	From a legal point of view, EDF has doubts concerning the legal aspect of this paragraph Firstly, the article 154(2) states ‘All TSOs of a synchronous area shall have the right to specify, in the synchronous area operational agreement, common additional properties of the FCR required to ensure operational security in the synchronous area, by means of a set of technical parameters and within the ranges in Article 15(2)(d) of [RfG] and Articles 27 and 28 of [DCC]’. EDF’s interpretation is that the additional properties should only concern parameters mentioned: - either in the Article 15(2)(d) of RfG for generating units, which makes sense as the Article 15(2)(d) precisely deals with FSM - or in the Articles 27 and 28 of DCC, for demand facilities Therefore, the article 3 paragraph 2 is out of scope.  [Fourth] the terms “as long as possible” introduce a new obligation that goes even beyond RfG requirements, still without any due and sound justification	Yes	Please refer to answers of comment No.4 and No.6.	EDF
22	A-2	3(2)	Each TSO shall ensure that each FCR providing unit stays connected to the grid within the frequency ranges specified for an unlimited time period in Article 13(1) of Commission Regulation (EU) 2016/631 and has to take into account possible under frequency load shedding actions of the relevant system operators which might include also FCR providing units. If frequency deviation exceed above specified frequency ranges FCR providing unit or groups should continue the operation and FCR providing further, according to the technical capabilities of the units and national requirements. Justification:	No	Thank you very much for the comment.	Towarzystwo Gospodarcze Polskie Elektrownie Each

No	Article	Specified Article	Comment/ Suggestion	Change in Article yes/no	Response	Reviewer affiliation
			Taking into account NC RfG' requirements which are dedicated, as a role, to new power generating modules, proposed wording is in line with the conditions foreseen therein. Moreover, it mitigates the risk for existing units without prejudice to the derogation procedure stated in Title V of NC RfG.			
23	A-2	3(2)	Not only under frequency load shedding actions but also over frequency generation shedding actions have to be taken into account. These actions might be mandated by system operator, local distribution system operator or smart inverter standards. We recommend Entso-E carefully aligns with requirements of DSOs to ensure TSO-DSO coherence on reaction to frequency deviations. For example some DSO require power to remain the same when the frequency changes and disconnection at a certain threshold. These thresholds have to be coherent with the frequency ranges specified in Article 13(1) of Commission Regulation (EU) 2016/631. Some DSOs are not keen to have linear response to RoCoF (Rate of change of frequency), to prevent islanding in the grid. They instead have shedding concepts, that must be coherent. When DSOs have several steps in their automatic system defence disconnection scheme, FCR providing units should not be in the first step; but this will be difficult to control with distributed resources. SO GL must also be coherent with smart inverter standards (such as VFR 2014 DIN VDE 0126-1-1/A1 which sets decoupling at 50,6 Hz.).	No	Thank you very much for this comment. Of course these aspects have to be taken into account. It is clear that the mentioned coherence is of utmost importance.	NUVVE
24	A-2	3(2)	It is important to consider under-frequency load shedding, but also over-frequency generation shedding actions have to be considered. These actions might be mandated by transmission or system operators, or smart inverter standards. smartEn recommends coherence and alignment between TSO-DSO on reaction to frequency deviations. Disconnection thresholds after frequency changes, for example, have to be coherent with the frequency ranges specified in Article 13(1) of Commission Regulation (EU) 2016/631. Since some DSOs have shedding concepts instead of liner response to the rate of change of frequency, these have to be coherent. SO GL must also be coherent with smart inverter standards (such as VFR 2014 DIN VDE 0126-1-1/A1 which sets decoupling at 50,6 Hz.).	No	Thank you very much for this comment. Of course these aspects have to be taken into account. It is clear that the mentioned coherence is of utmost importance.	smartEn

No	Article	Specified Article	Comment/ Suggestion	Change in Article yes/no	Response	Reviewer affiliation
25	A-2	3(2)	On the principle note [1] with respect to the retroactive but for information our installations already integrate well this constraint	No	Thank you very much for this comment.	Compagnie Nationale du Rhône (CNR)
26	A-2	3(2)	<p>This article raises several remarks or questions:</p> <p>There is no obvious link between extreme frequency ranges withstand capability and FCR needs.</p> <p>This article leads to only two solutions for all existing FCR providing units/groups that are not compliant with this requirement: retrospective application or stepping down from participating in FCR services.</p> <p>Not only would it be difficult, if not impossible, to upgrade the units due to technical constraints, but there is also absolutely no link between FCR capability and this requirement: many existing units/groups have been capable of providing FSM for many years, without the capability to withstand unlimited time at 51Hz, for example. Moreover, imposing such a requirement would lower the liquidity for this product, and as a result would most probably increase the cost for the system.</p> <p>The article 3.2 also introduces a new obligation which goes beyond RfG requirements with the wording “as long as possible”, which should be justified.</p>	Yes	Please refer to answers of comment No.4 and No.6.	Eurelectric
27	A-2	3(2)	<p>Is the article legally consistent?</p> <p>The article 154(2) states ‘All TSOs of a synchronous area shall have the right to specify, in the synchronous area operational agreement, common additional properties of the FCR required to ensure operational security in the synchronous area, ‘by means of a set of technical parameters <u>and</u> within the ranges in <u>Article 15(2)(d)</u> of [RfG] and Articles 27 and 28 of [DCC]’. Our interpretation is that the additional properties should only concern parameters mentioned:</p> <ul style="list-style-type: none"> <li>- in the Article 15(2)(d) of RfG for generating units, which makes sense as the Article 15(2)(d) precisely deals with FSM</li> </ul>	Yes	Please refer to answers of comment No.4 and No.6.	Eurelectric

No	Article	Specified Article	Comment/ Suggestion	Change in Article yes/no	Response	Reviewer affiliation
			<p>- in the Articles 27 and 28 of DCC, for demand facilities eurelectric also emphasises the provision is related to 'constructive capability' (which is the scope of RfG) and not the 'operation' (in scope of SO GL). If the operation requires a specific capability, including existing units, this has to be established, and can by no means simply refer to RfG requirements for legal consistency.</p> <p>This article is in contradiction with the result of the debate that occurred, during the drafting phases of both RfG and SO GL:</p> <p>(i) For the RfG, whether RfG should apply to existing units or not. The conclusion was that existing units are not in the scope of RfG (except in case of substantial modification of the connection agreement) as specified in RfG art. 4.1;</p> <p>(ii) For the SO GL, about the fact that any reference to RfG should only apply to those units in the scope of the RfG, and otherwise for existing units to the extent of their declared capabilities.</p>			
28	A-2	3(2)	<p>There is a contradiction with the principle of frequency quality target. Furthermore this is in contradiction with the principle the SO GL/Art. 127.9, according which "All TSOs shall endeavour to comply with the values for the frequency quality defining parameters or for the frequency quality target parameter [Annex III]." Generators already regret the inconsistency between these frequency quality parameters (in particular 'Standard frequency range' of +/- 50 mHz) and the constructive capabilities of RfG (in particular, unlimited period for range of +/- 1000 mHz) for <u>new units</u>, while an uncertainty remains on the speed and the extend of development of generation connected through power electronics. All TSOs are now introducing an obligation for existing units to comply with some RfG requirements (in particular here, Article 13(1)), otherwise they are no more allowed to participate to FCR. This is not acceptable.</p>	No	<p>We cannot see any contradiction to the frequency quality defining parameters or for the frequency quality target parameters since these parameters shall ensure in principle frequency mean values below certain limits. Even being within these limits does not prevent from being outside in specific situations. Please refer to answers of comment No.4 and No.6.</p>	Eurelectric
29	A-2	3(2)	<p>Article 3 paragraph 2 refers to the Article 13(1) of the Commission Regulation (EU) 2016/631 which requires at least 30 minutes of</p>	Yes	<p>Concerning the question of 15/30 minutes there is a study (<i>Link to Study:</i></p>	CELEST

No	Article	Specified Article	Comment/ Suggestion	Change in Article yes/no	Response	Reviewer affiliation
			<p>operation and even, for a frequency deviation between 49 Hz and 51 Hz, an unlimited operation time for operation. This brings two observations:</p> <ul style="list-style-type: none"> <li>- Based on network behaviour over last years in continental Europe, a 15 minutes response is amply enough to guaranty the frequency stability.</li> <li>- FCR providing groups with a limited reservoir are effectively excluded from the market by these rules, either due to technical limitation (unlimited operation) or economic limitation (batteries storage being very expensive).</li> </ul> <p>We therefore request a 15 minutes time of operation instead of 30 minutes/unlimited time in order to avoid unnecessary cost to the European consumers, allow the development of a European battery-storage industry and allow an equitable market regarding the limited energy reservoir groups.</p>		<p><a href="https://consultations.entsoe.eu/system-operations/cbam/">https://consultations.entsoe.eu/system-operations/cbam/</a>) in progress to find out which value to be applied. Therefore it is out of the scope of this proposal. (in fact, there are already several battery providers participating in markets with a 30-minute-rule).</p>	
30	A-2	3(3)	<p>Regarding the so called "Reserve Mode", we request TSOs to be very prescriptive in the parameters that unit with Limited Energy Reservoirs would have to respect in this mode and how they will be measured and verified.</p> <p>Moreover, market players must have sufficient time to implement this complex mode.</p>	Yes	<p>An additional prescription is provided. New requirements are important for security of supply. Moreover the transitional period has been introduced to enable proper adaptation of existing providing units where necessary.</p>	Energy Pool
31	A-2	3(3)	<p>This paragraph establishes that "FCR providing units or FCR providing groups with limited energy reservoir in stand-alone operation shall have a ratio of rated power to prequalified power of at least 1.25:1 and a sufficient energy reservoir dimensioning of at least [1] MWh per 1 MW prequalified power to be sufficient to cover a <math>\Delta f</math> of 200 mHz for at least [30] minutes in positive and negative direction."</p> <p>These measures are unjustifiably too strict and will not lead to a better frequency regulation but to a completely unfair market where FCR providing groups with limited energy reservoir (such as batteries) will be out of competition.</p> <p>Last years tendency shows that frequency variations does not show great deviations and do not last long (they have a symmetric profile that will assure a charge/discharge ratio near to 1), consequently there is no need to oversize the equipment. Furthermore, the recharge</p>	Yes	<p>FCR is needed to stabilize the system. The requirements are determined with respect to the responsibility of ensuring security of supply in possible stressed system conditions. They represent harmonized rules which are applied in the same way to all kinds of technologies. It is up to the provider to comply by managing/optimizing its pool.</p> <p>The conclusion from the view that "<i>last years tendency shows that frequency</i></p>	CELEST

No	Article	Specified Article	Comment/ Suggestion	Change in Article yes/no	Response	Reviewer affiliation
			<p>strategy will assure that the SOC does not reach 0% or 100% values. The dimensioning of 1 MWh per 1 MW qualified is again a gross underestimation of the tightness of this kind of equipment. Considering a 15 minute of symmetric response test for continental Europe, a dimensioning of 0.5 MWh per 1 MW will be enough and allow the energy storage systems market to develop in Europe which will permit to this strategic technology to develop in Europe.</p> <p>There is also stated that if the group is outside stand-alone operation "...the FCR provider shall be able to compensate a possible lack of energy and hence a lack of FCR by shifting FCR activation to providing groups or providing units with unlimited energy reservoirs." This measure is unacceptable, as the unlimited energy reservoir groups do not have a back-up group neither the limited energy ones may have. In case of default an economical penalization should be imposed, as it is done now.</p> <p>As a conclusion we strongly oppose these unnecessary burden imposed on FCR providing groups with a limited reservoir, which would result in unnecessary cost to European customers, deteriorate competitiveness of European economies and kill the European nascent battery-storage industry and operators. Quite on the opposite, battery-storage should be viewed as a strategical priority by ENTSOE and encouraged as such.</p>		<p><i>variations does not show great deviations and do not last long</i>" cannot be supported since the observations show clearly degrading quality of frequency.</p> <p>The application to individual units would be only relevant in cases where an FCR provider offers only one single unit which is not realistic.</p> <p>The TSO is entitled to agree with the provider a solution equivalent to the 1.25:1 ratio.</p>	
32	A-2	3(3)	<p>Stand alone FCR providing units cannot be considered in the same way as stand alone FCR providing groups. Aggregated resources can be optimised differently than single units, and derating them by 20% (ie 1.25:1) limits the FCR provider's ability to optimise and utilise its resources for the good of the energy system.</p> <p>Artificially de-rating stand alone FCR providing groups with limited energy reservoir to a ratio of rated power to prequalified power of at least 1.25:1 does not allow for optimisation of the group. It removes management of the resources in the group from the aggregator's hands and having the regulation artificially manage them. It would create an unfair bias to single utility scale FCR providing units. A FCR providing group is not only characterized by the size of its resources but also by the sophistication of its management system. Rated power and energy reservoir dimensioning should only be based on capabilities of the FCR</p>	Yes	<p>FCR is needed to stabilize the system. The requirements are determined with respect the responsibility to ensure security of supply in possible – in particular stressed - system conditions. They represent harmonized rules which are applied in the same way to all kinds of technologies. It is up to the provider to comply by managing/optimizing its pool.</p> <p>The application to individual units would be only relevant in cases where an FCR provider offers only one single</p>	NUVVE

No	Article	Specified Article	Comment/ Suggestion	Change in Article yes/no	Response	Reviewer affiliation
			<p>providing group to fulfil its bids.</p> <p>Fair competition would be prevented if FCR providers are not able to differentiate by the sophistication of their aggregation. They have for example possibilities to meet the requirements by replacing the units that make up the group or releasing constraints on individual units in their group.</p> <p>FCR providers should be allowed to prove the rating their group deserves, as part of the pre-qualification when they explain their charging strategy. An auditable management system combined with strong penalties for failing to deliver would leave the risk on the FCR provider side. Any action to incentivise providers to act responsibly with their bidding behaviour should not automatically remove risk by forcing derating. Rather, market participants should be left to manage their own resources, and heavily penalised if they fail to fulfil their bids. PJM in the US does this, with favourable results.</p> <p>Energy reservoir dimensioning should be allowed to take into account the energy losses of the system for negative direction.</p>		<p>unit which is not realistic.</p> <p>The requirement as such does not prevent from any optimizing approach.</p> <p>Moreover the TSO is entitled to agree with the provider a solution equivalent to the 1.25:1 ratio.</p>	
33	A-2	3(3)	<p>Stand alone FCR providing units cannot be considered in the same way as stand alone FCR providing groups. Aggregated resources can be optimised differently than single units, and derating them by 20% limits the FCR provider's ability to optimise and utilise its resources for the good of the energy system.</p> <p>Artificially de-rating standalone FCR providing groups with limited energy reservoir to a ratio of rated power to prequalified power of at least 1.25:1 does not allow for optimisation of the group. This removes management of the resources in the group from the aggregators hands and having the regulation artificially manage them. It would create an unfair bias to utility scale FCR providing units. An FCR providing group is not only characterized by the size of its resources but also by the particularities of its management system. Rated power and energy reservoir dimensioning should only be based on capabilities of the FCR providing group to fulfil its bids.</p> <p>Further clarification is needed on what this ratio encompasses and when it is applied since pre-qualified power is not necessarily equal to offered power.</p> <p>For pools of batteries where these are not on standalone basis, smartEn proposes that the ratio should not be a "hard cut", or at least</p>	Yes	<p>Please refer to answers of comment No. 32</p>	smartEn

No	Article	Specified Article	Comment/ Suggestion	Change in Article yes/no	Response	Reviewer affiliation
			the total MWs of the pool should be considered as the rated power, and not only the individual battery. Energy reservoir dimensioning should be allowed to take into account the energy losses of the system for negative direction.			
34	A-2	3(3)	Art. 3.3 specifies : FCR providing units or FCR providing groups are deemed to have limited energy reservoirs in case a full activation for the time frame contracted by the TSO might, without active state-of-charge..... The wording “active state-of-charge” is only used for batteries and batteries are excluded of the scope of GL SO. This because Art. 2.1.a of the GL SO is clear : only the installations subjected to the RfG NC are within the scope of GL SO. VGB proposes to review this article completely for devices with a limited energy reservoir, subjected to RfG and so included in the scope of GL SO	No	There is no contradiction to GL SO - Art. 2, 1. (a). It refers to SGUs and not to reserve providing units which represent another category (apart from that batteries could be type B as well). It is a fact that batteries participate in FCR services and respective harmonized rules for all technologies are needed to ensure security or power supply also under stressed system conditions and a level playing field.	VDE
35	A-2	3(3)	eurelectric requests for clarity on the scope of this article. “Active State of Charge management” and the order of magnitude of active power (1 MW) indicates that this article deals with battery storage. As the application of SO GL to battery storage is not yet clear, eurelectric urges ENTSO-E to further involve stakeholders for this clause before finalizing the proposal.	Yes	Please refer to answer of comment No. 34	Eurelectric
36	A-2	3(3)	EDF understands that this paragraph deals with battery storage. EDF considers that this proposal is premature: a global reflection must be carried out on this technology, on the future results of the CBA but also more generally on regulatory aspects (as exchanged in GC&SO-ESCs), in order to achieve consistent requirements.	No	Thank you very much for this comment. It will be taken into account during the further development of requirements in the future.	EDF
37	A-2	3(3)	ENGIE supports the answer written by Eurelectric. Moreover we note that no legal basis exists for applying the proposed article 3.3 on batteries. The wording “active state-of-charge” is only used for batteries and batteries are excluded of the scope of the SOGL as specified in Article 2.1.a of the SOGL. This article specifies that only Power Generating Modules subjected to RfG NC are in the scope of SOGL and batteries are not subjected to the RfG NC.	Yes	Please refer to answer of comment No. 34	ENGIE

No	Article	Specified Article	Comment/ Suggestion	Change in Article yes/no	Response	Reviewer affiliation
38	A-2	3(3)	<p>Although the 25% offset power hard limit is understandable, as discussed in the explanatory note, it has the same effect as the reserve mode discussed below. Here the definition of the alert state is a relevant point. The alert state definition should take into account the long-lasting deviations up to 50mHz in a dynamic way and not in a static way, as today. A deviation of 49.9mHz for longer than 15 mins (today defined as normal state - there are examples in the frequency historical data of such deviations that last for hours) is equally or more dangerous than a 50 mHz deviation for more than 15 minutes (today defined as alert state). Thus the 25% requirement should not be hard and instead a concept similar to the reserve mode should be applied, assigning the mean deviation to FRR (as it should be conceptually) and the short term deviations to FCR. We feel that the reserve mode and the 25% requirements eventually have the same effect both on the FCR reserves activated and on the SoC of LERs with active SoC management. We feel that the reserve mode method should be applied generally for long-lasting frequency deviations that do not trigger the alert state (see comment above). Such a mechanism truly distinguishes the FCR task from the FRR task and makes the 25% offset requirement obsolete. Additionally we feel the existing grid codes for FRR are sufficient and if enforced adequately will render reserve mode less relevant or obsolete altogether.</p>	Yes	<p>The 25% rule shall ensure that FCR providing units/groups with limited energy reservoirs can recharge without impacting the availability for bigger deviations. In general FRR shall not intentionally be used to replace FCR which is not available. FCR has therefore to be always available according to Article 156(7,8) of SO GL. In general, FCR and FRR should be provided independently.</p>	Elektrizitätswerke Kanton Zürich (EKZ)
39	A-2	3(3)	<p>NUVVE We support the ability for the FCR provider to compensate a possible lack of energy and hence a lack of FCR by shifting FCR activation to providing groups or providing units with unlimited energy reservoirs.</p> <p>We support the possibility of a Reserve Mode close to exhaustion of the energy reservoir due to maximum FCR provision in one direction. It is not only a method of decreasing potential resource volatility, it also acknowledges the traits of batteries as an energy resource. Our system already has this capability, and we use it to safeguard the batteries in the EVs we aggregate to avoid fully charging or discharging the individual resources that constitute our capacity.</p>	Yes	Thank you very much for the comment	NUVVE

No	Article	Specified Article	Comment/ Suggestion	Change in Article yes/no	Response	Reviewer affiliation
40	A-2	3(3)	Compagnie Nationale du Rhône (CNR) For remark if necessary, run of river hydros are LER and do not have a "SOC" (term used for batteries). Their primary source which is water is available according to weather conditions, tributaries, and under regulatory operating constraints of the levels	Yes	In general the requirements do not distinguish between technologies to ensure a level playing field (exemption: the reserve mode requires power electronics).  The adapted requirements clarify that FCR providing units or groups that contain technical entities with unlimited energy reservoirs and technical entities with limited energy reservoirs shall not be considered as LER in case their energy reservoir does not limit the capability to provide FCR according to Article 156(7) of SO GL.	Compagnie Nationale du Rhône (CNR)
41	A-2	3(3)	We support the ability for the FCR provider to compensate a possible lack of energy and hence a lack of FCR by shifting FCR activation to providing groups or providing units with unlimited energy reservoirs. We support the possibility of a Reserve Mode close to exhaustion of the energy reservoir due to maximum FCR provision in one direction. It is not only a method of decreasing potential resource volatility, it also acknowledges the traits of batteries as an energy resource	Yes	Thank you very much for the comment.	smartEn
42	A-2	3(3)	eurelectric would request for clarity on the scope of this article. "Active State of Charge management" and the order of magnitude of active power (1 MW) indicate that this article deals with battery storage. As the application of SO GL to battery storage is not yet clear, eurelectric would urge ENTSO-E to further involve stakeholders for this clause before finalizing the proposal.	Yes	Please refer to answer of comments No. 40.	Eurelectric
43	A-2	3(3)	I have only one remark re. the proposal of the rated power to prequalified power ratio of 1.25 / 1.  We have experience operating an FCR qualified unit in The Netherlands (Li-ion, 10 MW <sub>nom</sub> / 10 MWh capacity). This one ALWAYS fulfills it's FCR obligation although there is active SOC management. The FCR obligation at Tennet is just for 30 minutes so the SOC will only become active AFTER the obligation window has passed (and in the rare case	Yes	FCR has to be always available according to Article 156(7,8) of SO GL. In general, FCR and FRR should be provided independently.  The 25% rule shall ensure that FCR providing units/groups with limited energy reservoirs can recharge (at up to 49,99 mHz frequency deviations)	Yuso

No	Article	Specified Article	Comment/ Suggestion	Change in Article yes/no	Response	Reviewer affiliation
			<p>where the deviation was 200 mHz for the 30 minute interval).            We believe that the SOC management does not mean that FCR obligation can not always be fulfilled, it really depends on how the SOC management is defined/programmed. In fact and in The Netherlands, the SOC management and FCR deliveries to Tennet go hand in hand because of the algorithm chosen. As a consequence, we believe it to be unnecessary to demand overpowering the rated/pre-qualified power for finite reservoir FCR eligible assets such as batteries. You can not expect SOC management to do exactly what is doing in the example underpinning the 25% overcompensating requirement. SOC is imposed for a multitude of reasons but better not in a brute-force manner like in the example.</p> <p>For your info here a screenshot of the active operation of the Zeeland asset we manage. Blue is the actual activation in MW of the unit and green a steering signal. You can see the corresponding SOC curve on the chart below. The SOC is actively managed but as you can see, it closely matches the 50% despite the FCR obligation requiring sometimes 40% activation. The reason is of course that the frequency itself varies rapidly around 50 Hz and FCR actually requires little energy throughput. Nevertheless, units like this have an own demand (cooling primarily) requiring the SOC management more than the FCR does.</p>		<p>without impacting the availability for bigger deviations.            Recent observations show definitely longer lasting periods with similar deviations.</p> <p>Anyway, the TSO is entitled to agree with the provider a solution equivalent to the 1.25:1 ratio.</p> <p>The adapted requirements moreover clarify that FCR providing units or groups that contain technical entities with unlimited energy reservoirs and technical entities with limited energy reservoirs shall not be considered as LER in case their energy reservoir does not limit the capability to provide FCR according to Article 156.7.</p>	
44	A-2	3(4)	<p>The requirement of frequency measurement and control on every single potential electrical "island" implies unequal market access for flexibility aggregators; in fact, aggregators with a significant geographical spread of their assets will be more penalized than their competitors. Such a consequence cannot be the intention behind the recent, and repeated, CE orientations, pushing for facilitated market access for all technologies.</p> <p>Besides, this requirement is out of proportion, considering that the aggregator would have to equip all of its potential islands equivalently, while its actual contribution to FCR would not be equivalent.</p> <p>However, Voltalis does appreciate the rationale for this requirement. A</p>	Yes	<p>The requirement has been amended. Decentralized solutions are favored but in justified cases centralized solutions are allowed under certain conditions to ensure that a single event does not result in an outage of more than 150MW of FCR.</p>	VOLTALIS

No	Article	Specified Article	Comment/ Suggestion	Change in Article yes/no	Response	Reviewer affiliation
			more balanced approach could be to impose island FCR management to a BSP only in islands where its aggregated capacity is over a predefined threshold; this threshold would be set at a level consistent with the BSP ability to significantly contribute to FCR in an island situation.			
45	A-2	3(4)	Art. 3.4 specifies : Where centralized control of FCR providing units or FCR providing groups is applied ... VGB is convinced that this requirement describes an installation and is a subject for the RfG NC and not for the GL SO	Yes	There is probably a misunderstanding concerning RfG. RfG gives basic requirements for new units which have to be fulfilled as preconditions for connection. This should not be mixed up with conditions for prequalification of reserves which are procured and paid by TSOs.	VGB
46	A-2	3(4)	The proposed article specifies that: "Where centralized control of FCR providing units or FCR providing groups is applied each TSO shall ensure, that in case of regional disturbances, system split or communication problems separate frequency measurements for every geographical area behind a connection point to the voltage level of 110 kV and above are used and the autonomous activation of FCR is still possible." we note that such requirement is a description of an installation and it is a subject for the RfG NC and not for the SOGL.	Yes	There is probably a misunderstanding concerning RfG. RfG gives basic requirements for new units which have to be fulfilled as preconditions for connection. This should not be mixed up with conditions for prequalification of reserves which are procured and paid by TSO.s	ENGIE
47	A-2	3(4)	EDF considers that this article does not require any change or clarification.	Yes	thank you very much for the comment	EDF
48	A-2	3(4)	NUVVE It should be clarified small FCR units in a group should be allowed to have a virtual frequency meter for a given zone for the group and not for every single unit. Requiring a meter for each unit making a group is disproportionate. Clarification is needed on what "autonomous activation" means. FCR providing groups can be made of units scattered across a large territory. Functionality of independent units making the group cannot be guaranteed to be the same functionality as the group's, should it be split. However individual units could continue to provide FCR within the limits of their individual or sub-group capabilities.	Yes	Please refer to answer of comments No. 44	NUVVE

No	Article	Specified Article	Comment/ Suggestion	Change in Article yes/no	Response	Reviewer affiliation
49	A-2	3(4)	<p>smarten It should be clarified that small FCR providing units in a group are allowed to have a virtual frequency meter for a given zone for the group and not for every single unit.</p> <p>Clarification is needed on what “autonomous activation” means. FCR providing groups can be made of units scattered across a large territory. Functionality should be guaranteed to be the same between the units forming the group, otherwise these groups should be split. In general, local frequency measure is acceptable if the possibility exists for small consumers to have a virtual frequency meter for a given zone rather than for every single asset.</p> <p>Regarding autonomous delivery of FCR providing units in case of frequency split:</p> <p>Today TSOs procure up to 70% of FCR capacities at the European scale, and at least 30% within their control area. For the FCR capacities acquired beyond their own control area, TSOs have no control on the location of the assets, and therefore cannot guarantee that the system will be well balanced in case of a frequency split. The measure of autonomous response cannot ensure this. What can be guaranteed, however, is that in case of frequency split, the units/groups can behave as a unique asset, delivering the full FCR in autonomous fashion according to pre-agreed conditions.</p> <p>There is no need to require every single asset of a pool to be qualified to deliver FCR on its own in case of frequency split. This would make pools obsolete. Further clarification from the TSOs is needed to understand the reasoning behind the need for autonomous activation of FCR providing units.</p>	Yes	Please refer to answer of comments No. 44	
50	A-2	3(5)	<p>Art 3.5 specifies : Each TSO shall require that FCR providing units and FCR providing groups continue providing FCR and are not allowed to reduce activation in case of a frequency deviation outside the frequency range of +/- 200 mHz up to the frequency ranges as defined in Article 3.2.</p> <p>VGB is convinced that the real characteristics of the existing FCR providing unit have to be respected as indicated in the comment above.</p>	No	<p>Full activation also in case of frequency deviations of more than 200 mHz has always been an obvious requirement for FCR providing units according to existing Policy 1 of Operation Handbook for RG CE.</p> <p>Activation of full (procured) FCR also beyond a frequency deviation of 200 mHz is a must. The requirement reflects the current level of security.</p>	VGB

No	Article	Specified Article	Comment/ Suggestion	Change in Article yes/no	Response	Reviewer affiliation
51	A-2	3(5)	<p>What means " are able" in the sentence: "FCR providing units or groups which are able to further increase/decrease power output beyond the frequency range of +/- 200mHz shall not limit their activation to the procured volume." ?</p> <p>Such a constraint seems to be unrealistic for FCR units committed on several mechanisms such as R3. Which contract / mechanism would be prior? Would this additional service be paid? How deal with penalties in case of misexecution ? How be in a position to guarantee to TSO the volume contracted on the different reserves ? How would TSO manage the availability of their reserves in such situations?</p> <p>In addition we warn that the demand facilities will be reluctant to participate in FCR program and as so, such a requirement will reduce the available volume on the market, if they must increase/decrease there load consumption outside the procured volume range.</p> <p>While awaiting clarification on the meaning of "are able", we suggest that demand facilities are excluded of such a requirement to help TSO enlarging the volume of qualified FCR on the market.</p>	Yes	The requirement to "further increase/decrease power output" was deleted.	Energy Pool
52	A-2	3(5)	<p>Art. 3.5 specifies: FCR providing units or groups which are able to further increase/decrease power output beyond the frequency range of +/- 200 mHz shall not limit their activation to the procured volume</p> <p>VGB is convinced that an activation beyond the procured volume is no longer qualified as FCR but as aFRR and so subjected to a dedicated contract and subjected to dedicated documents describing aFRR.</p> <p>Outside the frequency range of +/- 200 mHz, the requirements for LFSM-O and LFSM-U apply and not the FSM requirements. Both LFSM requirements have to be described in a dedicated document and not in this document.</p>	Yes	The requirement to "further increase/decrease power output" was deleted.	VGB
53	A-2	3(5)	<p>This article deals with the activation of low-frequency sensitive mode (LFSM) and not FCR. As long as there is no European market for LFSM, the 'activation scheme' and the remuneration of this function, that is also an ancillary service, will have to be discussed at national level.</p>	No	<p>LFSM is not an issue in this article as the requirements apply to already prequalified and procured reserves and not as a connection requirement in this context.</p> <p>Additionally, the requirement to "further increase/decrease power output" was deleted.</p>	EDF

No	Article	Specified Article	Comment/ Suggestion	Change in Article yes/no	Response	Reviewer affiliation
54	A-2	3(5)	<p>ENGIE supports the answer written by Eurelectric. The proposed article specifies that “Each TSO shall require that FCR providing units and FCR providing groups continue providing FCR and are not allowed to reduce activation in case of a frequency deviation outside the frequency range of +/- 200 mHz up to the frequency ranges as defined in Article 3.2. FCR providing units or groups which are able to further increase/decrease power output beyond the frequency range of +/- 200 mHz shall not limit their activation to the procured volume.”</p> <p>We note that each activation beyond the procured volume shall not be qualified as FCR but as aFRR and subjected to the dedicated documents describing aFRR.</p>	Yes	The requirement to “further increase/decrease power output” was deleted.	ENGIE
55	A-2	3(5)	<p>FCR providing units and FCR providing groups with limited reservoir could further increase/decrease power output beyond the frequency range of +/- 200 mHz only if they are compensated for their activation beyond the procured volume and as long as the energy in their reservoir is sufficient for them to meet their duration commitments.</p>	Yes	The requirement to “further increase/decrease power output” was deleted.	NUVVE
56	A-2	3(5)	<p>Nationale du Rhône (CNR) Applies to the LFSM mode. Must not be treated in the SOGL framework. It is discussed in the framework of the Rfg.</p> <p>For information, run of river hydros participate in LFSM type mode as long as their primary source, water levels and security are available</p>	Yes	Please refer to answer of comments No. 50 and No. 53.	Compagnie Nationale du Rhône (CNR)
57	A-2	3(5)	<p>FCR providing units and FCR providing groups with limited reservoir could further increase/decrease power output beyond the frequency range of +/- 200 mHz only if a) they are compensated for their activation beyond the procured volume, and b) as long as the energy in their reservoir is sufficient for them to meet their duration commitments.</p>	Yes	The requirement to “further increase/decrease power output” was deleted.	smartEn
58	A-2	3(5)	<p>This article deals with the activation of limited frequency sensitive mode (LFSM) and not FCR. So we wonder about legal consistency of this article, since the article 154 of SO GL, according to which ENTSO-E proposes these additional properties, is on ‘FCR technical minimum requirements’.</p> <p>Moreover, as long as there is no European market for LFSM, the ‘activation scheme’ and the remuneration of this function, that is also</p>	Yes	Please refer to answer of comments No. 50 and No. 53.	Eurelectric

No	Article	Specified Article	Comment/ Suggestion	Change in Article yes/no	Response	Reviewer affiliation
			an ancillary service, will have to be discussed at national level.			
59	A-5	General statement regarding whole article	For EDF, this article does not require any change or clarification.	No	Thanks for your comment.	EDF
60	A-6	General statement regarding whole article	For EDF, this article does not require any change or clarification.	No	Thanks for your comment.	EDF