
All CE TSOs' proposal for additional properties of FCR in accordance with Article 154(2) of the Commission Regulation (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation

Date 13/03/2018

DISCLAIMER

This document is released on behalf of all CE transmission system operators ("TSOs") only for the purposes of the public consultation on the TSOs' proposal for additional properties of FCR ("FCR additional properties") in accordance with Article 154(2) of the Commission Regulation (EU) No 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation ("SO GL"). This version of the proposal for additional properties of FCR does not in any case represent a firm, binding or definitive TSOs' position on the content.

Contents

Whereas.....	3
Article 1 Subject matter and scope.....	4
Article 2 Definitions and interpretation.....	4
Article 3 ADDITIONAL PROPERTIES OF FREQUENCY CONTAINMENT RESERVES ACCORDING TO ARTICLE 154(2) SO GL.....	4
Article 4 Publication and implementation of the Proposal for additional properties of FCR	5
Article 5 Language	6

All TSOs, taking into account the following,

Whereas

- (1) This document is a common proposal developed by all transmission system operators from synchronous area of Continental Europe (hereafter referred to as “TSOs”) regarding the development of the additional properties of frequency containment reserves (hereafter referred to as “FCR additional properties”) in accordance with Article 154(2) of Commission Regulation (EU) 2017/1485 establishing a guideline on electricity transmission system operation (hereafter referred to as “SO GL”). This proposal is hereafter referred to as “FCR additional properties proposal”.
- (2) The FCR additional properties proposal takes into account the general principles and goals set in the COMMISSION REGULATION (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation. The goal of the COMMISSION REGULATION (EU) 2017/1485 is to ensure the operational security of the interconnected transmission system. It sets for this purpose requirements for approval of terms and conditions or methodologies of TSOs, in particular concerning additional properties of the FCR in accordance with Article 154(2).
- (3) 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 reflect the individual needs of the SA CE the TSOs of SA CE propose respective additional properties described below.
- (4) The proposal specifies conditions for FCR providing units and/or FCR providing groups: with respect to activation of FCR and in particular with respect to FCR availability also in stressed system status with a view also to new technologies.
- (5) Article 6(2)(d)(iii) of the SO GL requires all TSOs to develop methodologies, conditions and values included in the synchronous area operational agreements in Article 118 concerning the additional properties of the FCR in accordance with Article 154(2).
- (6) According to Article 6 of SO GL the proposal for additional properties of FCR is expected to reduce the risk of not appropriate activation of FCR and of non-availability of FCR in stressed system state. With this in mind the proposed additional properties presented below will contribute to system stability and therefore to the achievement of the objectives of Article 4 of the SO GL.
- (7) Specification of activation of FCR has the goal to ensure fast response and therefore help to stabilize the system. Specifications for FCR providing units and/or FCR providing groups with limited energy reservoir aim at ensuring sufficient availability also in stressed system status. Specifications for frequency measurement aim at ensuring availability of independent functionality of FCR providing units and/or FCR providing groups in particular in case of system split or communication problems. The transition period is defined to avoid too abrupt change of requirements for already existing FCR providing units and/or FCR providing groups.

- (8) In conclusion, the proposal for additional properties of FCR contributes to the general objectives of the COMMISSION REGULATION (EU) 2017 to the benefit of all market participants and electricity end consumers.

SUBMIT THE FOLLOWING PROPOSAL FOR ADDITIONAL PROPERTIES OF FCR TO ALL REGULATORY AUTHORITIES:

Article 1

Subject matter and scope

The additional properties of FCR as determined in this proposal shall be considered as the common proposal of all TSOs in accordance with Article 154 (2) of SO GL and shall cover the requirements in addition to Article 154 for FCR providing units and/or FCR providing groups.

Article 2

Definitions and interpretation

1. For the purposes of the proposal for additional properties of FCR, terms used in this document shall have the meaning of the definitions included in Article 3 of the SO GL, of Regulation (EC) 714/2009, Directive 2009/72/EC, Commission Regulation (EU) 543/2013 and COMMISSION REGULATION (EU) 2016/631.
2. In this proposal for additional properties of FCR, unless the context requires otherwise:
 - a. the singular indicates the plural and vice versa;
 - b. the table of contents and headings are inserted for convenience only and do not affect the interpretation of this proposal for additional properties of FCR; and
 - c. any reference to legislation, regulations, directive, order, instrument, code or any other enactment shall include any modification, extension or re-enactment of it then in force.

Article 3

ADDITIONAL PROPERTIES OF FREQUENCY CONTAINMENT RESERVES ACCORDING TO ARTICLE 154(2) SO GL

1. Each TSO shall ensure that either each FCR providing unit and FCR providing group or – in case a TSO utilizes combined responses to fulfil its FCR delivery – the activation of all FCR providing units and FCR providing groups are not artificially delayed, begin as soon as possible but no later than 2 s after a frequency deviation, and the activation shall rise linearly or quicker. If the delay in initial activation of active power frequency response is greater than two seconds, the power generating facility owner shall provide technical evidence demonstrating why a longer time is needed. These requirements should be checked during prequalification according to Article 155 in the SO GL.
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 has to take into account possible under frequency load shedding actions of the relevant system operators which might include also FCR providing units.
3. 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 (SOC) management, lead to a full exhaustion of the energy reservoir taking into account the effective SOC available at the beginning of that time frame. For prequalification the TSOs shall require that FCR providing units or FCR providing groups to respect the following:

- FCR providing units or FCR providing groups with limited energy reservoirs can operate in stand-alone operation in case they have an active SOC management. Stand-alone operations means that operation is completely separated from operation of FCR providing units or FCR providing groups with unlimited energy reservoirs. The active SOC management shall ensure a continuous physical activation of automatic FCR. To enable the SOC management, such 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 Δf of 200 mHz for at least [30] minutes in positive and negative direction. In any way any lead time for the charging process needs to be considered for the energy management. The values in brackets given in this paragraph are depending on the minimum activation period to be ensured by FCR providers according art.156 (9, 10, 11) of the SO GL.
- In case FCR providing units or FCR providing groups with limited energy reservoirs are supplying FCR outside stand-alone operation as defined above, 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. In any case the shifting of FCR activation shall guarantee continuity of the FCR provision.
- The SOC management of FCR providing units and FCR providing group shall not rely on over fulfilment of activation.
- FCR providing units or FCR providing groups with limited energy reservoirs which are connected to the grid by means of inverters shall ensure that close to the limit of its energy reservoir the remaining capacity is sufficient for keeping its reactivity on short-term frequency deviations. Therefore, the unit shall switch from normal mode into reserve mode at t_{FAT} (full activation time of aFRR according to Art. 158 (1f) SO GL) before exhaustion of the energy reservoir due to maximum FCR provision in one direction. During the reserve mode the unit shall only react on short-term frequency deviations by following the zero-mean frequency:

$$\overline{\Delta f_{zero-mean}(t)} = \Delta f(t) - \frac{1}{n(t-t_{FAT})} \sum_{i=0}^{n(t-t_{FAT})} \Delta f(t-t_i) \text{ (reserve mode)}$$

For transition from normal mode into reserve mode a linear transition function T should be applied within the transition period of $t_{exhaustion} - t_{FAT}$ to $t_{exhaustion}$:

$$f_{reaction}(t) = \overline{\Delta f_{zero-mean}(t)} \cdot T + (1 - T) \cdot \Delta f(t)$$

4. 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.
5. 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.

Article 4

Publication and implementation of the Proposal for additional properties of FCR

1. The TSOs shall publish the proposal for additional properties of FCR without undue delay after all NRAs have approved the proposal or a decision has been taken by the Agency for the Cooperation of Energy Regulators in accordance with Article 8(1) and Article 11 of the SO GL.

2. The TSOs shall implement the proposal for additional properties of FCR provided one month after the regulatory authorities have approved the proposal in accordance with Article 6(3) SO GL or a decision has been taken by the Agency in accordance with Article 6(8) SO GL. The transitional period for the implementation of additional properties of FCR by the affected FCR providers shall be two years: one year for TSOs to adapt their Terms & Conditions and one additional year for FCR providers to implement the additional properties on FCR.

Article 5 **Language**

The reference language for this proposal for additional properties of FCR shall be English. For the avoidance of doubt, where TSOs need to translate this proposal for additional properties of FCR into their national language(s), in the event of inconsistencies between the English version published by TSOs in accordance with Article 8 of the SO GL Regulation and any version in another language, the relevant TSOs shall, in accordance with national legislation, provide the relevant national regulatory authorities with an updated translation of the proposal for additional properties of FCR.