

All TSO-s proposal of the Continental Europe for the additional characteristics of FCR according to Article 145 (2) of the EU Commission Regulation 2017/1485 dated 2 August 2017 on establishing a guideline on the Electricity Transmission System Operator

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All Transmission System Operators of the Synchronous Area of Continental Europe shall undertake as follows:

Whereas:

- (1) This document is the common proposal of all TSO-s of the Synchronous Area of Continental Europe (as follows TSO-s) regarding the draft of additional characteristics of for the Frequency Containment Reserves FCR (as follows “additional characteristics of FCR” according to Article 154 (2) of EU Commission Regulation 2017/1485, dated 2 August 2017, for establishing a guideline for the electricity transmission system operation (“SO GL).
- (2) The proposal of the additional FCR characteristics shall take into consideration the general principles and purposes defined on EU Commission Regulation 2017/1485 dated 2 August 2017, for the establishment of the electricity transmission system operator. The Purpose of the EU Commission Regulation 2017/1485 is to guarantee the operational security of the interconnected transmission system. For this purpose shall define the requirements to approve the TSO-s terms and conditions or the methodologies, especially regarding additional characteristics of FCR according to Article 154 (2).
- (3) Regarding Article 154 of SO GL, that defines the minimum technical characteristics of FCR, all TSO-s of the Synchronous Area shall have the right to specify, at the operational agreement of the synchronous area the common additional characteristics of FCR that are required to ensure the operational safety of the Synchronous Area, by technical parameters and within the intervals of Article 15 (2) (d) of the EU Commission Regulation 2016/631 dated 14 April 2016 for the establishment of the network code on the requirements for the generators grid connection and Articles 27 and 28 of the EU Commission Regulation 2016/1388 dated 17 August 2016 for the establishment of the Network Code for the connection request. To reflect the individual needs of the Synchronous Area of Continental Europe, the TSO-s of the Synchronous Area of Continental Europe shall propose the additional respective characteristics described hereinbelow
- (4) The proposal shall define for the FCR providing units and/or the providing groups of FCR: regarding the FCR activation and especially regarding FCR availability even for the system status to the security limits with a point of view even to new technologies.
- (5) Article 6 (2) (d) (iii) of SO GL requires that all TSO-s shall draft the methodology, condition and values included on the operational agreement of the Synchronous Area, Article 118 regarding the additional characteristics of FCR according to Article 154 (2).
- (6) According to Article 6 of SO GL, the proposal for the additional characteristics of FCR is expected to reduce the activation risk of unappropriate FCR and of unavailable FCR to the status of the system regarding the security limits. Having this into consideration, the proposed additional characteristics submitted hereinbelow shall contribute to the

sustainability of the system and to reach the objectives of Article 4 So LG.

- (7) Specification of FCR activation aims to ensure the quick response and for this reason helps in the sustainability of the system. The specifications for the safety units of FCR and/or the providing groups of FCR with limited reserves of electricity aim to ensure sufficient availability even for the status of the system in limited operational security. The specifications for frequency metering aim to ensure the operational availability of independent FCR providing units and/or providing groups of FCR especially in case of allocating the system or the communication problems. The transitory period shall be defined to avoid also the quick amendment of the requests for the currently existing units for providing the FCR and/or the FCR providing groups.
- (8) Finally, the proposal of FCR additional characteristics shall contribute to general objectives of EU Commission Regulation 2017/1485 for the best of all electricity market participants and end – use customers.

SUBMISSION OF THE FOLLOWING PROPOSAL FOR THE ADDITIONAL CHARACTERISTICS OF FCR FOR ALL REGULATORY AUTHORITIES:

Article 1

Subject matter and scope

Additional characteristics of FCR as defined on this proposal shall be considered as a common proposal of all Continental Europe TSO-s according to Article 154 (2) of SO GL and shall cover the requirements except those of Article 154 for the FCR providing units and/or FCR providing groups.

Article 2

Definitions and interpretation

1. For the purposes of proposing the additional FCR characteristics, the terms used on this document shall have the meaning of the definitions included on Article 3 of SO GL, Article 2 of EU Regulation 714/2009, article 2 EC Directive 2009/72/EC, article 2 of EU Commission Regulation 543/2013 and Article 2 of EU Commission Regulation 2016/631.
2. On this proposal of FCR additional characteristics, except when the concept requires otherwise:
 - a) the singular defined the plural and vice-versa;
 - b) the table of content and the titles are set only for facilitation purpose and do not affect the interpretation of this proposal of the additional FCR characteristics; and

- c) any reference to the legislation, regulation, directive, order, instrument, code or any other act shall include any amendment, addition or re-approval effective at the approval time.

Article 3

Additional characteristics of FCR

1. Each TSO shall guarantee that, or that any FCR providing unit and the group that ensures the FCR or – if one TSO uses combined responses to comply with the FCR safety – the activation of all FCR providing units and the safety groups of FCR is not delayed artificially, shall initiate as soon as possible but not later than 2 seconds from the Frequency Deviation and the activation shall be linear increased or quicker. If the delay for the initial activation of active power response to the frequency is higher than two seconds and/or the activation of active power response to the frequency may not be linear or quicker, the owner of the electricity generating facility shall ensure the technical evidence for the respective TSO, showing why it is necessary a longer time. These requirements shall be controlled during the prequalification according to Article 155 SO GL.
2. Each FCR unit or group of providers shall be able to stay connected to the network within the frequency range of 47.5 to 51.5 Hz for the time periods determined by the TSO, taking into account the technical limits of the respective units FCR insurance or FCR insurance groups in accordance with Article 154 (6) of SO GL. Each TSO in dialogue with DSOs must ensure that FCR in distribution is not significantly reduced by load switching actions.
3. The providing units of the FCR or the FCR providing groups shall be considered to have reserved a limited FCR of electricity (LER) in case of full continuous activation for a period of 2 hours if it is possible positive or negative direction , without considering the effects of managing the reserve of active energy, which may lead to a restriction of its ability to ensure full FCR activation according to Article 156 (8) of SO GL, due to the draining of its energy reserve considering the effective energy reservoirs. The FCR providing units or groups that are not considered as LER that are composed of technical facilities with limited reservoirs of electricity, shall be provided to be able to fully activate the FCR provision, according to Article 156 (7) of SO GL. To avoid doubts, the FCR providing units or groups that contain technical facilities with unlimited energy reserves and technical facilities with limited energy reserves shall not be considered LER if their energy reservoir does not limit the ability to provide FCR according to Article 156 (7) of SO GL.

If the FCR providing units of FCR providing groups that contain technical facilities with limited reservoirs of energy shall compensate the possible lack of energy and the lack of FCR, they shall be able to shift the FCR activation to available technical facilities to ensure FCR provision. On each case the shift of FCR activation shall guarantee the continuation of FCR provision. The FCR providing units or groups are considered as LER shall respect the minimum term of full FCR activation according to Article 156 (9), 156 (10) and 156 (11) of SO GL. The technical facilities with unlimited energy reserves of FCR providing units or groups shall not limit their FCR provision if the technical facilities with limited energy reservoir (of that FCR providing groups/units) are currently draining to negative or positive direction according to Article 156 (8) of SO GL.

Regarding the pre-qualification, the TSO-s shall require that the FCR providing units or groups shall respect as follows:

- The FCR providing groups or units that use the technical facilities with limited reservoir of energy, shall have the reservoir management of active energy. The management of active energy reservoir shall provide a continuous physical activation of FCR in normal status according to Article 156 (9) of SO GL. Following Article 156 (9) of SO GL, the FCR provider shall provide that the FCR groups or units that are considered as LER shall have a dimensioning of energy reservoir sufficient to cover the Frequency Deviation of 200 mHz for at least [15-30] minutes in positive, negative direction having into consideration the possible frequency deviations that may occur before the initiation of alarm status. To enable the management of active energy reservoir such providing units of FCR or FCR providing groups that are considered as LER shall have a report of nominal power with the pre-qualified power of about 1.25: 1 or an alternative solution with equivalent impact. Any time necessary for the filling process of the reservoir shall be considered for the management of energy reservoir. The value in brackets given on this paragraph depends on the minimum activation period that must be ensured by FCR providers according to Article 156 (9), (10) and (11) of SO GL.
- The management of the energy reservoir of FCR providing units or groups shall not be supported on the activation compliance.
- The FCR providing units or groups of FCR with limited energy reservoirs that are connected to the network by intervals shall ensure that to the limit of its energy reservoir, the remaining capacity is sufficient to maintain the counter response to the frequency deviations in short-term terms.

This means, that the unit shall transit from normal modality to reserve modality t_{FAT} (full activation period of aFRR according to Article 158 (1) (f) of SO GL) before the draining of energy reservoir due to maximum provision of FCR to that direction. During the reserve modality the unit shall react only to short term frequency deviations following the frequency with normal standart of distribution:

- $\overline{\Delta f_{zero-mean}(t)} = \Delta f(t) - \frac{1}{n(t-t_{FAT})} \sum_{i=0}^{n(t-t_{FAT})} \Delta f(t - t_i)$ (reserve modality)
- The transition from normal modality to reserve modality is implemented to a transitory linear operation T within the transitory period $t_{drainage} - t_{FAT}$ to $t_{drainage}$:
- $f_{aktivation}(t) = \overline{\Delta f_{zero-mean}(t)} \cdot T + (1 - T) \cdot \Delta f(t)$

The compliance of the above mentioned requests and those of Article 156 (9), (10) and (11) of SO GL shall be subject to the pre-qualification process defined by the TSO.

4. FCR providing units and groups shall bebased on local frequency measurement at least for connection point or when technically possible below on the side of the generating units, the power generating module or the demand unit.
5. FCR providing groups shall have decentralized frequency measurements for each connection point (based on local frequency measurement) that may be used either as default or as a backup solution to provide independent function and proper activation in case of central control errors, e.g. SCADA outage, faults in communication lines) or breakdown of the power grid system. In the case of central control, the additional requirements are as follows:
 - i. The monitoring operation shall detect any type of error of central control or frequency deviations between technical objects. FCR providers shall immediately initiate countermeasures to provide that FCR provision is not significantly adversely affected.
 - ii. The minimum local frequency measurement accuracy used for the fully decentralized **reserve / back-up** procedure may be reduced if accepted by the TSO to which the backup is connected.
6. For a period of 4 years after the entry into force of this proposal and in the event that a decentralized reserve procedure cannot be applied according to paragraph 5, it can be applied within a FCR providing group or in the event that the reserve procedure cannot meet the requirements of the TSO where the reserve is connected (eg accuracy or reliability of local frequency measurements) the implementation of a centralized control of FCR insurance groups is temporarily allowed under the following conditions:
 - i. To mitigate the risk of malfunctioning of technical facilities in case of central control errors (eg SCADA outage, problems in communication lines) and to limit the frequency impact, a single centralized regulator of FCR should not regulate more than 30 MW of FCR.

- ii. In accordance with Article 156 (6a) of the SOGL, the TSOs where the reserve is linked shall observe the part of the FCR provided in this way of the central control within the procurement process and apply a limit of the total quantity of the volume procured for each block of LFC up to 75 MW according to article 154 (4) of SOGL.
7. Each TSO shall require that FCR providing units and FCR providing groups continue to provide FCR and are not allowed to reduce activation in case of frequency deviation outside the frequency range +/- 200 mHz up to the specified frequency ranges in Article 3.2.

Article 4

Publication and implementation of the proposal for FCR additional characteristics.

1. The TSO-s shall publish the proposal of the FCR additional characteristics without unnecessary delays because all National Regulatory Authorities have the right to approve the proposal or the decision approved from the Agency for Energy Regulators Cooperation according to Article 8 (1) and Article 11 of SO GL.
2. The TSO-s shall begin to implement the FCR additional characteristics as specified on this project proposal immediately after the National Regulatory Authorities have approved the proposal according to Article 6 (3) SO GL or the decision is approved from the Agency according to Article 6 (8) SO GL. The transitory period for the implementation of additional FCR characteristics from FCR providers that are affected shall be two years: one for the TSO to adopt their Terms and Conditions and another additional year for FCR providers to implement the additional FCR characteristics.

Article 5

Language

The reference language for this proposal of additional FCR characteristics shall be the english language. To avoid doubts, when the TSO-s shall translate this proposal of FCR additional characteristics in their native language, in case of incompatibilities between the english language version published from the TSO according to Article 8 of SO GL regulation and any version in another language, the respective TSO-s according to the national legislation, shall ensure to the respective national regulatory authorities an updated translation of the proposal for the FCR additional characteristics.