CNMC
COMISIÓN NACIONAL DE LOS MERCADOS Y LA COMPETENCIA

RESOLUCIÓN POR LA QUE SE APRUEBAN LAS PROPIEDADES ADICIONALES DE LAS RESERVAS DE CONTENCIÓN DE FRECUENCIA DE ACUERDO CON EL ARTÍCULO 154(2) DEL REGLAMENTO (UE) 2017/1485 DE LA COMISIÓN EUROPEA DE 2 DE AGOSTO DE 2017 POR EL QUE SE ESTABLECE UNA DIRECTRIZ SOBRE LA GESTIÓN DE LA RED DE TRANSPORTE DE ELECTRICIDAD– SAFA POLICY

DCOOR/DE/016/18

SALA DE SUPERVISIÓN REGULATORIA

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En Madrid, a 4 de marzo de 2021

La Sala de la Supervisión Regulatoria, de acuerdo con la función establecida en el artículo 7.1.b de la Ley 3/2013, de 4 de junio, de creación de la Comisión Nacional de los Mercados y la Competencia, modificada por el Real Decreto-ley 1/2019 y desarrollada a través de la Circular 3/2019, de 20 de noviembre, de la Comisión Nacional de los Mercados y la Competencia, por la que se establecen las metodologías que regulan el funcionamiento del mercado mayorista de electricidad y la gestión de la operación del sistema, y en cumplimiento de lo establecido en el artículo 23 de dicha Circular, y en cumplimiento de la función de aprobación de las condiciones y metodologías que se utilicen a efectos de preservar la seguridad de la operación, la calidad de la frecuencia y el uso eficiente del sistema y los recursos interconectados previstas en el artículo 6 del Reglamento(UE) 2017/1485, de la Comisión, de 2 de agosto de 2017, por el que se establece una directriz sobre la gestión de la red de transporte de electricidad, acuerda emitir la siguiente Resolución.

ANTECEDENTES DE HECHO

El 13 de septiembre de 2018 tuvo entrada en el Registro de la CNMC escrito de Red Eléctrica de España, S.A.U., presentando las propuestas de todos los TSO (*Transmission System Operators*) del área síncrona continental, elaboradas en el marco de ENTSO-E (*European Network of Transmission System Operators-*

Electricity), de acuerdos operacionales, según se definen en el artículo 118(1) del Reglamento (UE) 2017/1485.

Las propuestas, presentadas para aprobación, fueron las siguientes:

- Propuesta de reglas de dimensionamiento de reserva para la contención de la frecuencia de acuerdo con el artículo 153(2) del Reglamento (UE) 2017/1485.
- Propuesta de límites de intercambio y reparto de reservas para la recuperación de la frecuencia entre áreas síncronas, de acuerdo con los artículos 1761) y 177(1) del Reglamento (UE) 2017/1485.
- Propuesta de límites de intercambio y reparto de reservas de sustitución entre áreas síncronas, de acuerdo con los artículos 178(1) y 179(1) del Reglamento (UE) 2017/1485.

En el envío de estas propuestas se especificaba que continuaba el proceso de trabajo para acordar la propuesta opcional relativa a las Propiedades Adicionales de las reservas de Contención de la Frecuencia (RCF) recogida en el artículo 154(2) del Reglamento (UE) 2017/1485.

Con fecha 2 de abril de 2019, en el ámbito del Foro de Reguladores de Energía del área síncrona continental, las Autoridades Reguladoras acordaron aprobar las propuestas de acuerdos operacionales, según se definen en el artículo 118(1) del Reglamento (UE) 2017/1485 conforme a lo dispuesto en los arts. 6(2) a. y 40(6). Estas propuestas fueron aprobadas por la CNMC a través de la resolución por la que se aprueban las propuestas de todos los Gestores de la Red de Transporte del área síncrona continental de los acuerdos operacionales previstos en el artículo 118(1) del Reglamento (UE) 2017/1485 de la Comisión Europea de 2 de agosto de 2017 por el que se establece una directriz sobre la gestión de la red de transporte de electricidad.

Posteriormente, el 28 de enero de 2019, tras alcanzar un acuerdo, los Gestores de la red de Transporte de la Región síncrona continental remitieron la propuesta relativa a las Propiedades Adicionales para las Reservas de Contención de la Frecuencia. Las autoridades reguladoras solicitaron el reenvío de la misma como modificación de los acuerdos operacionales, y fue recibida el 24 de abril de 2021.

Las propiedades adicionales para la prestación de FCR son necesarias para reflejar las necesidades del área síncrona de Europa continental respecto a la activación y a la disponibilidad de FCR en una situación de estrés del sistema, poniendo especial atención en las nuevas tecnologías prestadoras de este servicio. De esta manera, se establecen condiciones particulares para las unidades o grupos de unidades proveedoras de FCR que están conectadas a la red a través de inversores, mantenido siempre el principio de no discriminación.

El 5 de octubre de 2020 las autoridades reguladoras de la región solicitaron a la Agencia para la Cooperación de los Reguladores de la Energía, ACER, una extensión de plazo de 3 meses para aprobar la propuesta, motivada por la necesidad de modificación de las propuestas recibidas por parte de las autoridades reguladoras, como habilita el artículo 5 del Reglamento (UE) 2019/942 del Parlamento Europeo y del Consejo, de 5 de junio de 2019, por el que se crea la Agencia de la Unión Europea para la Cooperación de los Reguladores de la Energía. El plazo para el acuerdo de los NRAs quedó así fijado en el 24 de enero de 2021.

El 21 de enero de 2021 las autoridades reguladoras alcanzaron en el ámbito del Foro de Reguladores de Energía del área síncrona continental el acuerdo de aprobación de las propiedades adicionales de las reservas de contención de frecuencia, ahora objeto de aprobación nacional en la presente Resolución.

FUNDAMENTOS DE DERECHO

El artículo 6 del Reglamento (UE) 2017/1485 regula la aprobación de las condiciones y metodologías que se utilicen a efectos de preservar la seguridad de la operación, la calidad de la frecuencia y el uso eficiente del sistema y los recursos interconectados.

En el artículo 5 del citado Reglamento se regula la fase previa de adopción de estos documentos, en el seno de los gestores de la red de transporte. Tanto en este artículo como en el art. 6 del mismo Reglamento se prevé que, tras esa fase inicial, las condiciones y metodologías se han de remitir a las Autoridades Reguladoras para su aprobación:

- *"Los GRT definirán las condiciones o metodologías exigidas por el presente Reglamento y las presentarán, a efectos de su aprobación, a las autoridades reguladoras competentes (…) dentro de los respectivos plazos previstos en el presente Reglamento…"* (art. 5.1).

- *"Cada autoridad reguladora aprobará las condiciones o metodologías desarrolladas por los GRT con arreglo a los apartados 2 y 3 (…)."* (art. 6.1.).

Según lo establecido en el art. 6.3 del citado Reglamento: *"Las propuestas relativas a las siguientes condiciones o metodologías deberán ser aprobadas por todas las autoridades reguladoras de la región correspondiente (…): d) las metodologías, las condiciones y los valores incluidos en los acuerdos operativos de zona síncrona previstos en el artículo 118, respecto a:(…) iii) las propiedades adicionales de la RCF, de conformidad con el artículo 154, apartado 2, (…)*

La falta de acuerdo, en el plazo previsto, entre las autoridades reguladoras con respecto a la propuesta de que se trata, determinaría la necesidad de que la

Agencia para la Cooperación de Reguladores de Energía (ACER) adopte la correspondiente decisión, en los términos establecidos en el artículo 6.8 del Reglamento (UE) 2017/1485.

Vistos los citados antecedentes de hecho y fundamentos de derecho, la Sala de Supervisión Regulatoria de la CNMC, de conformidad con lo previsto en el artículo 21 de la Ley 3/2013, de 4 de junio, y el artículo 14.1 del Estatuto Orgánico de la CNMC

RESUELVE

PRIMERO. Aprobar la propuesta de todos los GRT del área síncrona continental, elaboradas en el marco de ENTSO-E, de acuerdos operacionales para la RCF, según se definen en el artículo 154(2) del Reglamento (UE) 2017/1485.

Comuníquese esta Resolución al operador del sistema y publíquese en la página web de la CNMC.

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

21 January 2021

Contents

Whereas

(1) This document regards the common additional properties of Frequency Containment Reserves (hereinafter referred to as "FCR additional properties") for Synchronous Area Continental Europe (hereinafter referred to as "Synchronous Area CE") in accordance with Article 154(2) of Commission Regulation (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation (hereinafter referred to as "SO Regulation").

(2) With respect to Article 154 of the SO Regulation which determines FCR technical minimum requirements, all TSOs of a synchronous area have the right to specify, in the synchronous area operational agreement developed pursuant to Article 118 of the SO Regulation, common FCR additional properties required to ensure operational security in the synchronous area, by means of a set of technical parameters and within the ranges set out 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 (hereinafter referred to as "RfG") and in Articles 27 and 28 of Commission Regulation (EU) 2016/1388 of 17 August 2016 establishing a Network Code on Demand Connection (hereinafter referred to as "DCC"). These additional properties as detailed in this document are subject to approval by the NRAs of the synchronous area according to Article 6(3)(d)(iii) of the SO Regulation.

(3) For Synchronous Area CE, the Synchronous Area Framework Agreement for Regional Group Continental Europe (hereinafter referred to as "SAFA") entered into force on 14 April 2019, following the approval by NRAs according to Article 6(3)(d) of the SO Regulation. The SAFA at that time did not include any FCR additional properties.

(4) To reflect the individual needs of the Synchronous Area CE, some common additional properties are nonetheless needed for FCR providing units and/or FCR providing groups with respect to the activation of FCR and to FCR availability in a stressed system status posing particular attention to the new technologies. To this extent particular conditions are specified for FCR providing units or FCR providing groups which are connected to the grid via inverters. However, the principle of non-discrimination is still respected since these conditions are based on the distinctive features of this technology without restricting the provision of FCR.

(5) Once approved, these FCR additional properties shall be included in the SAFA, as an integral part of this document.

(6) Where references to the RfG are cited, these references shall be intended as reflecting the possible extreme system status where FCR provision is essential for grid security. They shall not be deemed to contradict the application of RfG provisions only to new installations.

(7) The FCR additional properties are expected to reduce the risk of inappropriate activation of FCR and of unavailability of FCR in a stressed system state. With this in mind, these properties will contribute to system stability and therefore to the achievement of the objectives of Article 4 of the SO Regulation.

(8) The specification of activation of FCR has the goal to ensure fast response and therefore help to stabilise the system. Specifications for FCR providing units and/or FCR providing groups with limited energy reservoir (hereinafter referred to as "LER") 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.

(9) In conclusion, the FCR additional properties contribute to the general objectives of the SO Regulation to the benefit of all market participants and electricity end consumers.

Article 1
Subject matter and scope

1. The FCR additional properties as determined in this document shall be considered as the properties developed in accordance with Article 154(2) of the SO Regulation and shall establish the requirements in addition to those foreseen in Article 154 of the SO Regulation for FCR providing units and/or FCR providing groups.

Article 2
Definitions and interpretation

1. For the purposes of the FCR additional properties, terms used in this document shall have the meaning of the definitions included in Article 3 of the SO Regulation, Article 2 of Regulation (EU) 2019/943, Article 2 of Directive (EU) 2019/944, Article 2 of Commission Regulation (EU) 543/2013 and Article 2 of RfG.

2. In addition, the following definitions shall apply:
   a) Active Energy Reservoir Management: active charging/discharging of the reservoir depending on the state of charge which results from FCR activation to avoid a status of a completely full/empty reservoir;
   b) Centralised Frequency Measurement or Centralised FCR Controller: principle of using a single frequency measurement for activation of a number of decentrally located technical entities forming a FCR providing unit or providing group. The application of this principle requires the respective transmission of the frequency signal to the individual FCR providing unit or FCR providing group;
   c) Decentralised Frequency Measurement: principle of using independent on-site frequency measurements at the connection points or below at site of generating units of the technical entities forming FCR providing units or FCR providing groups and activation of FCR based on this on-site measurement;
   d) Effective Energy Reservoir: the energy reservoir of a storage device which can effectively be used for energy feed/absorption;
   e) LER FCR Providing Units or LER FCR Providing Groups: FCR providing units or groups with limited energy reservoirs, fulfilling the criteria according to Article 3(5);
   f) Normal Mode: activation of FCR depending on the deviation of system frequency;
   g) Reserve Mode: activation of active power response depending on short-term frequency deviations in relation to the mean frequency deviation;
   h) Technical Entity: single power generating module or demand unit.

3. In this document, 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 these common FCR additional properties;
   c) references to an “Article” are, unless otherwise stated, references to an Article of this document;
   d) references to a “paragraph” are, unless otherwise stated, references to a paragraph included in the same Article of this document where it is mentioned; and
   e) 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

1. Each TSO shall check the conformity of FCR providing units and of FCR providing groups with the rules under this Article and with the provisions set in Article 156(9), 156(10) and 156(11) of the SO Regulation in the course of the prequalification according to Article 155 of the SO Regulation and in addition by (ex-post) monitoring of activation of FCR according to Article 154(3) of the SO Regulation. Each TSO shall apply respective monitoring procedures.

2. Each TSO shall ensure that the activation of FCR providing units and FCR providing groups:
   a) is not artificially delayed and begins as soon as possible but no later than 2 seconds after a frequency deviation; and
   b) rises at least linearly.

   When one of the requirements a) or b) cannot be met, the FCR providing group or FCR providing unit shall provide technical evidence to the reserve connecting TSO. The reserve connecting TSO assesses these justifications and decides whether or not the unit or group can be qualified to provide FCR. A refusal to be qualified shall be duly motivated by the reserve connecting TSO. The motivated decision shall be communicated to the FCR provider and relevant regulatory authority.

3. According to Article 154(6) of theSO Regulation, each FCR providing unit or group shall be capable of activating FCR within the frequency range of 47,5 to 51,5 Hz and for time periods defined at national level by the competent entity according to Articles 7 and 13 of RfG, taking into account the technical boundary conditions of the respective FCR providing units or FCR providing groups. Each TSO shall, in coordination with the DSOs, ensure that distributed FCR is not significantly reduced by load shedding actions.

4. 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 a frequency deviation outside the frequency range of +/- 200 mHz up to the frequency ranges as defined in paragraph 3.

5. FCR providing units or FCR providing groups are deemed as LER FCR Providing Units or LER FCR Providing Groups in case a full continuous activation for a period of 2 hours in either positive or negative direction might, without consideration of the effect of an Active Energy Reservoir management, lead to a limitation of its capability to provide the full FCR activation in accordance with Article 156(8) of the SO Regulation, due to the depletion of its energy reservoir(s) taking into account the Effective Energy Reservoir effectively available.

   For the avoidance of doubt, FCR providing units or groups that contain technical entities with unlimited energy reservoirs and technical entities with limited energy reservoirs shall not be considered LER FCR providing unit or group in case their energy reservoir does not limit the capability to provide FCR according to Article 156(7) of the SO Regulation.

   FCR providing units or groups not deemed as LER FCR providing units or groups that contain technical entities with limited energy reservoirs shall thus ensure to be able to fully activate their FCR provision in accordance with Article 156(7) of the SO Regulation.

   Technical entities with unlimited energy reservoir of FCR providing units or FCR providing groups shall not limit their FCR provision in case technical entities with limited energy reservoir (of that FCR

providing group/unit) are already exhausted in either the positive or negative direction according to Article 156(8) of the SO Regulation.

For prequalification, the TSOs shall require that:

- LER FCR Providing Units or LER FCR Providing Groups shall have an Active Energy Reservoir management. Active Energy Reservoir management shall ensure a continuous physical activation of FCR in normal state according to Article 156(9) of the SO Regulation.
- In accordance with Article 156(9) of the SO Regulation, the FCR provider shall ensure that LER FCR Providing Units or LER FCR Providing Groups have an energy reservoir dimensioned to guarantee the minimum activation period set in accordance with Article 156(10) of the SO Regulation, by additionally taking into account possible frequency deviations that might happen before entering into alert state.
- To enable an Active Energy Reservoir Management, LER FCR Providing Units or LER FCR Providing Groups may prequalify a power for FCR limited to 0.8 of the rated power (i.e. a ratio of rated power to prequalified power of at least 1.25:1); a deviation from this requirement is possible in case an alternative solution with an equivalent effect as in guaranteeing a continuous FCR provision while applying an Energy Reservoir Management. Any lead time for the charging process needs to be considered for Active Energy Reservoir management.
- Active Energy Reservoir Management of LER FCR providing units and LER FCR providing groups shall not rely on over fulfilment of activation.
- Besides ensuring that the energy reservoir is sufficient to continuously activate FCR in normal state and fully activate FCR in alert state for the time period pursuant to Article 156(9) of the SO Regulation, LER FCR providing units (either single or belonging to a LER FCR providing group) that are prequalified for the first time after the entry into force of the methodology and are technically capable (especially inverter-connected assets) shall ensure that close to the upper or lower bounds of the energy reservoir the remaining capacity is sufficient for keeping a proper response on short-term frequency deviations. Therefore, they shall switch from the Normal Mode (reaction to normal frequency deviation) into a Reserve Mode (reaction to zero-mean frequency deviation). Annex I provides the standard criteria governing the operation in Reserve Mode and the transition from Normal Mode to Reserve Mode and viceversa with reference to LER FCR providing units. Each TSO may decide the relevant criteria to be applied in its control area: if no criteria are defined, the standard ones referring to LER FCR providing units apply.

6. FCR providing units (either single or belonging to a FCR providing group) shall be equipped with local frequency measurement at least per connection point or below when it is technically feasible at the Technical Entity of the FCR providing unit.

7. FCR providing groups shall implement alternatively one of the following approaches:
   a) Decentralised Frequency Measurements at least per connection point in analogy to what is foreseen for FCR providing units in paragraph 6;
   b) a Centralised FCR Controller with Decentralised Frequency Measurements per connection point (based on local frequency measurement) to be used as a fallback solution to ensure an autonomous function and a proper activation in case of errors in the Centralised FCR Controller itself (e.g. outage of SCADA, faults of communication lines) or in case of a system split affecting the perimeter of the group; if the group includes FCR providing units, local frequency measurements available for these units pursuant to paragraph 6 shall be part of the fallback solution; or

c) an alternative solution with equivalent effect to the fallback solution pursuant to b), as in guaranteeing a proper activation in case of errors in the Centralised FCR Controller or in case of a system split.

8. In case the Decentralised Frequency Measurements are used as a fallback solution pursuant to paragraph 7(b):
   a) an observation function shall detect any kind of errors of the central control or frequency discrepancies among the technical entities within the perimeter of the group;
   b) the FCR provider shall immediately initiate appropriate counter-measures to ensure that the FCR provision is not significantly negatively impacted by switching to the Decentralised Frequency Measurements; and
   c) the minimum accuracy of the local frequency measurement used as a fallback solution can be reduced according to the national terms and conditions applicable to the reserve connecting TSO.

9. In case the alternative solution with equivalent effect pursuant to paragraph 7(c) is implemented:
   a) if the FCR providing group includes FCR providing units, the local frequency measurements available for these units pursuant to paragraph 6 may be integrated in the alternative solution;
   b) the FCR provider shall demonstrate the effectiveness of the alternative solution with respect to the decentralised frequency measurements; and
   d) the solution may be implemented only if allowed by the national terms and conditions, applicable to the reserve connecting TSO.

10. For a time period of 4 years after the entry into force of the FCR additional properties, the implementation of a Centralised FCR Controller non compliant with the requirement set in paragraph 7 is temporary allowed under the following conditions:
    a) To mitigate the risk of misbehavior of technical entities in case of errors of the Centralised FCR controller (e.g. outage of SCADA, faults of communication lines) and to limit the impact on frequency, a single non compliant Centralised FCR Controller shall not control a FCR capacity greater than 1% of the reference incident for Synchronous Area CE according to Article 153(2)(b)(i) of the SO Regulation .
    b) The reserve connecting TSO shall monitor the share of FCR capacity managed by non compliant Centralised FCR Controllers within the procurement process; in order to ensure operational security pursuant to Article 154(4) of the SO Regulation, in each LFC Block the amount of FCR capacity managed by centralised controllers shall not exceed 2.5% of the reference incident for Synchronous Area CE according to Article 153(2)(b)(i) of the SO Regulation .

    After 4 years after the entry into force of the FCR additional properties, Centralised FCR Controllers non compliant with the requirements set in paragraph 7 are no longer allowed.

Article 4
Publication and implementation of the FCR additional properties proposal

1. The TSOs shall publish the FCR additional properties without undue delay after the approval by the NRAs of the Synchronous Area CE.

2. The TSOs shall start to implement the FCR additional properties as specified in this proposal immediately after the approval by all NRAs of the Synchronous Area CE.

3. The transitional period for the implementation of additional properties of FCR by the existing affected FCR providers shall be two years as of the NRAs' approval: one year for TSOs to adapt their national Terms and Conditions and one additional year for FCR providers to implement the FCR additional properties.

4. Each TSO may recommend to extend the provisions of the Reserve Mode to existing LER FCR providing units which are connected to the grid by means of inverters: in this case the rules for the application of requirements to existing units reported in Article 4(1)(b) of RfG apply and the deadline for the implementation is set accordingly.

Article 5
Language

1. The reference language for these FCR additional properties shall be English. For the avoidance of doubt, where TSOs need to translate these FCR additional properties 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 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 FCR additional properties.

Annex I – Normal vs Reserve Mode

LER FCR Providing Units (either single or belonging to a LER FCR Providing Group) that are prequalified for the first time after the entry into force of the methodology and are technically capable (e.g. inverter-connected assets) shall be able to switch from Normal Mode to Reserve Mode when upper (soc_{max}) or lower (soc_{min}) state of charge limits are exceeded. These limits are defined by the amount of energy necessary to provide FCR for a time interval equal to full activation time of aFRR:

$$soc_{min} = \frac{P * \Delta t_{FAT}}{C}$$
$$soc_{max} = 1 - soc_{min}$$

where

C is the storage capacity in MWh;

P is the power offered for FCR provision in MW;

Δt_{FAT} is the aFRR full activation time in h.

When charge is restored, the unit shall revert to Normal Mode.

During Normal Mode the unit shall react to the normal frequency deviation $\Delta f(t)$ while in Reserve Mode the unit shall react only on the short-term frequency deviation by following the zero-mean frequency:

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

During the transition period from Normal Mode to Reserve Mode and viceversa, the unit shall react on the combination $f_{reaction}(t)$ of normal frequency deviation and short-term frequency deviation as described by the following equation:

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

where T is the weighting function defined as follows.

For the transition from Normal Mode to Reserve Mode:

$$T = \begin{cases} 0 & t < t_{start} \\ \frac{t - t_{start}}{\Delta t_{FAT}} & for\ t_{start} \leq t < t_{start} + \Delta t_{FAT} \\ 1 & t \geq t_{start} + \Delta t_{FAT} \end{cases}$$

where t_{start} is the time when upper or lower state of charge limits are exceeded.

For the transition from Reserve Mode to Normal Mode

$$T = \begin{cases} 1 & t < t_{restore} \\ \frac{t_{restore} - t}{\Delta t_{FAT}} + 1 & for\ t_{restore} \leq t < t_{restore} + \Delta t_{FAT} \\ 0 & t \geq t_{restore} + \Delta t_{FAT} \end{cases}$$

where $t_{restore}$ is the time when upper or lower state of charge limits are restored.

Both in normal as well as in Reserve Mode the interval for frequency sensitivity mode shall be respected (the full frequency range is used as input signal, but the FCR provision is limited to short term frequency deviations in Reserve Mode).

POSITION PAPER OF THE REGULATORY AUTHORITIES OF CONTINENTAL EUROPE SYNCHRONOUS AREA

ON

THE 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

21 January 2021

I. Introduction and legal context

This document constitutes the agreement of the Regulatory Authorities of Continental Europe synchronous area (hereinafter referred to as: CE NRAs), as voted on 21 January 2021 on the Continental Europe TSOs' (hereinafter referred to as: CE TSOs) proposal for the Additional Properties of FCR (hereinafter referred to as: FCR additional properties) 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 (hereinafter referred to as: SO GL).

This agreement of the CE NRAs shall provide evidence that a decision on the FCR additional properties does not, at this stage, need to be adopted by ACER pursuant to Article 6(8) of SO GL. It is intended to constitute the basis on which the Regulatory Authorities will each subsequently approve the above-mentioned methodology pursuant to Article 6 of SO GL.

The legal provisions that lie at the basis of the FCR additional properties, and this CE NRAs agreement on the above-mentioned methodology, can be found in Articles 4, 6, 118, 154 and 156 of SO GL and in Article 5 of the Regulation (EU) 2019/942 of the European Parliament and of the Council of 5 June 2019 establishing a European Union Agency for the Cooperation of Energy Regulators (recast) (hereinafter referred to as: Regulation 2019/942).They are set out here for reference.

SO GL

Article 4
Objectives and regulatory aspects

1 This Regulation aims at:
- *i) determining common operational security requirements and principles;*
- *ii) determining common interconnected system operational planning principles;*
- *iii) determining common load-frequency control processes and control structures;*
- *iv) ensuring the conditions for maintaining operational security throughout the Union;*
- *v) ensuring the conditions for maintaining a frequency quality level of all synchronous areas throughout the Union;*
- *vi) promoting the coordination of system operation and operational planning;*
- *vii) ensuring and enhancing the transparency and reliability of information on transmission system operation;*
- *viii) contributing to the efficient operation and development of the electricity transmission system and electricity sector in the Union.*

2 When applying this Regulation, Member States, competent authorities, and system operators shall:
- *(a) apply the principles of proportionality and non-discrimination;*
- *(b) ensure transparency;*
- *(c) […]*
- *(d) […]*
- *(e) respect the responsibility assigned to the relevant TSO in order to ensure system security, including as required by national legislation;*

[…]

Article 6
Approval of terms and conditions or methodologies of TSOs

1. Each regulatory authority shall approve the terms and conditions or methodologies developed by TSOs under paragraphs 2 and 3. The entity designated by the Member State shall approve the terms and conditions or methodologies developed by TSOs under paragraph 4. The

designated entity shall be the regulatory authority unless otherwise provided by the Member State.

2. *(…)*
3. *The proposals for the following terms and conditions or methodologies shall be subject to approval by all regulatory authorities of the concerned region, on which a Member State may provide an opinion to the concerned regulatory authority:*
   (a) (…)
   (b) (…)
   (c) (…)
   (d) methodologies, conditions and values included in the synchronous area operational agreements in Article 118 concerning:
      i) (…)
      ii) (…)
      iii) the additional properties of the FCR in accordance with Article 154(2);

[…]

6. *The proposal for terms and conditions or methodologies shall include a proposed timescale for their implementation and a description of their expected impact on the objectives of this Regulation. Proposals on terms and conditions or methodologies subject to the approval by several or all regulatory authorities shall be submitted to the Agency at the same time that they are submitted to regulatory authorities. Upon request by the competent regulatory authorities, the Agency shall issue an opinion within 3 months on the proposals for terms and conditions or methodologies.*
7. *Where the approval of the terms and conditions or methodologies requires a decision by more than one regulatory authority, the competent regulatory authorities shall consult and closely cooperate and coordinate with each other in order to reach an agreement. Where the Agency issues an opinion, the competent regulatory authorities shall take that opinion into account. Regulatory authorities shall take decisions concerning the submitted terms and conditions or methodologies in accordance with paragraphs (2) and (3), within 6 months following the receipt of the terms and conditions or methodologies by the regulatory authority or, where applicable, by the last regulatory authority concerned.*
8. *Where the regulatory authorities have not been able to reach an agreement within the period referred to in paragraph 7 or upon their joint request, the Agency shall adopt a decision concerning the submitted proposals for terms and conditions or methodologies within 6 months, in accordance with Article 8(1) of Regulation (EC) No 713/2009.*

[…]

Article 118
Synchronous area operational agreements

1. *By 12 months after entry into force of this Regulation, all TSOs of each synchronous area shall jointly develop common proposals for:*
   (a) (…);
   (b) additional properties of FCR in accordance with Article 154(2);
   […]
2. *All TSOs of each synchronous area shall submit the methodologies and conditions listed in Article 6(3)(d) for approval by all the regulatory authorities of the concerned synchronous area. Within 1 month after the approval of these methodologies and conditions, all TSOs of each synchronous area shall conclude a synchronous area operational agreement which shall enter into force within 3 months after the approval of the methodologies and conditions.*

Article 154
FCR technical minimum requirements

1. *Each reserve connecting TSO shall ensure that the FCR fulfils the properties listed for its synchronous area in the Table of Annex V.*

2. *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.*
3. *The reserve connecting TSO shall have the right to set out additional requirements for FCR providing groups within the ranges in Article 15(2)(d) of Regulation (EU) 2016/631 and Articles 27 and 28 of Regulation (EU) 2016/1388 in order to ensure operational security. Those additional requirements shall be based on technical reasons such as the geographical distribution of the power generating modules or demand units belonging to an FCR providing group. The FCR provider shall ensure that the monitoring of the FCR activation of the FCR providing units within a reserve providing group is possible.*

[…]

6. *Each FCR providing unit and each FCR providing group shall comply with the properties required for FCR in the Table of Annex V and with any additional properties or requirements specified in accordance with paragraphs 2 and 3 and activate the agreed FCR by means of a proportional governor reacting to frequency deviations or alternatively based on a monotonic piecewise linear power-frequency characteristic in case of relay activated FCR. They shall be capable of activating FCR within the frequency ranges specified in Article 13(1) of Regulation (EU) 2016/631.*
7. *Each TSO of the CE synchronous area shall ensure that the combined reaction of FCR of a LFC area comply with the following requirements:*
   a) *the activation of FCR shall not be artificially delayed and begin as soon as possible after a frequency deviation;*
   b) *in case of a frequency deviation equal to or larger than 200 mHz, at least 50 % of the full FCR capacity shall be delivered at the latest after 15 seconds;*
   c) *in case of a frequency deviation equal to or larger than 200 mHz, 100 % of the full FCR capacity shall be delivered at the latest after 30 seconds;*
   d) *in case of a frequency deviation equal to or larger than 200 mHz, the activation of the full FCR capacity shall rise at least linearly from 15 to 30 seconds; and*
   e) *in case of a frequency deviation smaller than 200 mHz the related activated FCR capacity shall be at least proportional with the same time behaviour referred to in points (a) to (d).*

[…]

Article 156
FCR provision

[…]

4. *An FCR provider shall guarantee the continuous availability of FCR, with the exception of a forced outage of a FCR providing unit, during the period of time in which it is obliged to provide FCR.*

[…]

7. *An FCR providing unit or FCR providing group with an energy reservoir that does not limit its capability to provide FCR shall activate its FCR for as long as the frequency deviation persists. (…)*
8. *A FCR providing unit or FCR providing group with an energy reservoir that limits its capability to provide FCR shall activate its FCR for as long as the frequency deviation persists, unless its energy reservoir is exhausted in either the positive or negative direction. (…)*
9. *For the CE and Nordic synchronous areas, each FCR provider shall ensure that the FCR from its FCR providing units or groups with limited energy reservoirs are continuously available during normal state. For the CE and Nordic synchronous areas, as of triggering the alert state and during the alert state, each FCR provider shall ensure that its FCR providing units or groups with*

limited energy reservoirs are able to fully activate FCR continuously for a time period to be defined pursuant to paragraphs 10 and 11. Where no period has been determined pursuant to paragraphs 10 and 11, each FCR provider shall ensure that its FCR providing units or groups with limited energy reservoirs are able to fully activate FCR continuously for at least 15 minutes or, in case of frequency deviations that are smaller than a frequency deviation requiring full FCR activation, for an equivalent length of time, or for a period defined by each TSO, which shall not be greater than 30 or smaller than 15 minutes.

[…]

12. *The FCR provider shall specify the limitations of the energy reservoir of its FCR providing units or FCR providing groups in the prequalification process in accordance with Article 155.*
13. *A FCR provider using FCR providing units or FCR providing group with an energy reservoir that limits their capability to provide FCR shall ensure the recovery of the energy reservoirs in the positive or negative directions in accordance with the following criteria:*
    a) *(…)*
    b) *for the CE and Nordic synchronous areas, the FCR provider shall ensure the recovery of the energy reservoirs as soon as possible, within 2 hours after the end of the alert state.*

Regulation 2019/942

Article 5

Tasks of ACER as regards the development and implementation of network codes and guidelines

[…]

3. *Where one of the following legal acts provides for the development of proposals for terms and conditions or methodologies for the implementation of network codes and guidelines which require the approval of all the regulatory authorities of the region concerned, those regulatory authorities shall agree unanimously on the common terms and conditions or methodologies to be approved by each of those regulatory authorities:*
    (a) a legislative act of the Union adopted under the ordinary legislative procedure;
    (b) network codes and guidelines that were adopted before 4 July 2019 and subsequent revisions of those network codes and guidelines; or
    (c) network codes and guidelines adopted as implementing acts pursuant to Article 5 of Regulation (EU) No 182/2011.

    The proposals referred to in the first subparagraph shall be notified to ACER within one week of their submission to those regulatory authorities. The regulatory authorities may refer the proposals to ACER for approval pursuant to point (b) of the second subparagraph of Article 6(10) and shall do so pursuant to point (a) of the second subparagraph of Article 6(10) where there is no unanimous agreement as referred to in the first subparagraph.

    The Director or the Board of Regulators, acting on its own initiative or on a proposal from one or more of its members, may require the regulatory authorities of the region concerned to refer the proposal to ACER for approval. Such a request shall be limited to cases in which the regionally agreed proposal would have a tangible impact on the internal energy market or on security of supply beyond the region.

[…]

6. *Before approving the terms and conditions or methodologies referred to in paragraphs 2 and 3, the regulatory authorities, or, where competent, ACER, shall revise them where necessary, after consulting the ENTSO for Electricity, the ENTSO for Gas or the EU DSO entity, in order to ensure that they are in line with the purpose of the network code or guideline and contribute to market integration, non-discrimination, effective competition and the proper functioning of the market. ACER shall take a decision on the approval within the period specified in the relevant network codes and guidelines. That period shall begin on the day following that on which the proposal was referred to ACER.*

II. The Continental Europe TSOs' proposal

The FCR additional properties are one of the terms & conditions and methodologies to be included in the Continental Europe Synchronous Area Operational Agreement (hereinafter referred to as: CE SAOA), in line with Article 118 of SO GL and to be subject to NRAs approval according to Article 6(3)(d) of SO GL.

All the CE SAOA's terms & conditions and methodologies subject to NRAs approval were consulted by the CE TSOs through ENTSO-E for one month from 30 March 2018 to 03 May 2018 in line with Article 11 of SO GL[1], in time for them to be submitted to CE NRAs by 14 September 2018, i.e. 12 months after the entry into force of SO GL, as foreseen by Article 118(1) of SO GL.

Nonetheless, the initial package submitted by the CE TSOs did not include the FCR additional properties, since the CE TSOs had not been able to reach an agreement by the required qualified majority on that topic. The last CE NRA received the original CE SAOA package on 2 October 2018. All CE NRAs agreed on 31 March 2019 to approve this package. The national decisions followed in the subsequent months and the terms & conditions and methodologies included in CE SAOA package were explicitly referred in the wider Synchronous Area Framework Agreement for Regional Group Continental Europe (hereinafter referred to as: CE SAFA) entered into force on 14 April 2019. The CE SAFA encompassed a reference to FCR additional properties as well: the proposal was listed in the A-section with the statement "to be included".

After the submission of the initial CE SAOA package to the CE NRAs, the CE TSOs kept working on the FCR additional properties with the aim to converge on a final proposal to be submitted to the CE NRAs at a second stage. On 28 January 2019, an agreement was reached by the CE TSOs and the FCR additional properties were finalised: hence the CE TSOs started submitting the proposal to the CE NRAs.

This submission was not considered legally sound by CE NRAs, since the FCR additional properties, despite being mentioned in the CE SAFA, were submitted after the original deadline of 14 September 2018 – and also well ahead of the final approval of the CE SAOA package referred to in the CE SAFA. For this reason, CE NRAs asked CE TSOs to resubmit the FCR additional properties proposal, clearly stating that this submission shall be intended as an amendment to the CE SAOA original package referred to in the CE SAFA.

The CE TSOs resubmitted the FCR additional properties between December 2019 and April 2020. The last NRA received the FCR additional properties proposal on 24th April 2020, thus a relevant decision by the CE NRAs was due by 24th October 2020 according to Article 6(7) of SO GL. On 5 October 2020 the CE NRAs asked ACER for a 3-month's prolongation of the legal deadline to reach an agreement on the FCR additional properties in order to allow some national regulatory authorities to run a public consultation at national level. ACER granted the extension with the Decision 28/2020, setting the new deadline on 24 January 2021.

The FCR additional properties foresees some requirements applicable to all the FCR providing units and groups; namely:

a) the FCR activation shall not be artificially delayed and shall start no later than 2 seconds after a frequency deviation with at least a linear rise; when one of these requirements cannot be met, the reserve connecting TSO shall be provided with technical evidence;

[1] The public consultation is available on the ENTSO-e website: https://consultations.entsoe.eu/system-operations/synchronous-area-operational-agreement-policy-1-lo/consult_view/

b) the operation shall be ensured within the frequency range 47.5 Hz – 51.5 Hz; the activation of FCR cannot be reduced in case of frequency deviation exceeding 200 mHz and up to the above-mentioned range;
c) FCR providing units shall be based on local frequency measurements;
d) FCR providing groups shall be equipped with decentralised frequency measurements to be used as a fallback solution in case of errors in FCR centralised controller or in case of system split; the reserve connection TSOs may reduce the accuracy required for the fallback decentralised frequency measurements; this requirement becomes compulsory 4 years after the entry into force of the FCR additional properties;
e) during this transitional period of 4 years the presence of FCR providing groups not matching the requirement mentioned in letter d) is allowed, subject to the following limitations:
    i) a single centralised controller cannot manage more than 30 MW;
    ii) each TSO shall ensure that in a single LFC block the amount of FCR managed by centralised controllers not compliant with letter d) does not exceed 75 MW.

Further requirements are foreseen for Limited Energy Reservoir FCR providing units or groups (hereinafter referred to as: LER FCR providing units or groups). In particular a FCR providing unit or group is deemed to be a LER FCR providing unit or group in case a full continuous activation for a period of 2 hours in either positive or negative direction might lead to a limitation of its capability to provide the full FCR activation in accordance with Article 156(8) of the SO GL, due to the depletion of its energy reservoir(s). FCR providing units and groups not deemed as LER may include technical entities with limited reservoirs: they shall nonetheless ensure a continuous FCR activation, even if the limited reservoirs are depleted.

LER FCR providing units and groups shall implement an Active Energy Reservoir management in order to ensure the continuous FCR activation in normal state, as required by Article 156(9) of SO GL; for this reason, the ratio between the prequalified and the rated power shall not overcome 0.8 (or equivalently the rated power shall be at least 1.25 times the prequalified power) or an alternative solution with equivalent effect shall be proposed.

Moreover, LER FCR providing units or groups connected by inverters shall implement the so-called Reserve Mode, i.e. keeping a proper response to short-term frequency deviations close to the limit of the energy reservoir to preserve the inertia of the system.

The FCR additional properties are compulsory for both new and existing units: the affected FCR provider have two years to comply with the new provisions.

The proposal will enter into force once approved by the CE NRAs.

The proposal includes also a description of its expected impact on the objectives of SO GL, in line with Article 6(6) of SO GL.

III. The Regulatory Authorities' position

On the content of the TSOs' proposal

Article 154(2) of SO GL allows the TSOs to define some additional properties for FCR providing units and/or groups: these properties can be established when setting up the SAOA according to Article 118 or at a later stage and may be extended to all the FCR providing units and/or groups according to article 2 of SO GL and not limited to new units only, as instead generally foreseen for the provisions included in the connection codes[2]. Up to this extent, a transitional period shall be foreseen in order

[2] The connection codes indeed allows the TSOs to extend the provisions to existing units as well, subject to a specific cost-benefit analysis.

to provide the affected FCR providers with a proper amount of time to update their equipment to comply with the new provisions.

The FCR additional properties proposed by the CE TSOs match what is mentioned above: the properties are extended to both new and existing units and the compliance is requested in two years (but for the fallback approach based on decentralised frequency measurement that becomes compulsory 4 years after the entry into force of the FCR additional properties).

The CE NRAs have nonetheless some concerns about the technical content of the FCR additional properties

Fallback approach

The compulsory installation of decentralised frequency measurements to be used as a fallback represents a significant cost that might turn some FCR providers to cease the service and exit from the already developed FCR markets. This would be detrimental to the competition. Moreover, the CE TSOs don't seem to have properly evaluated all the possible alternatives: the FCR additional properties consider the decentralised frequency measurement as the only possible fallback solution, tolerating a reduced accuracy in the samples with respect to the data used for FCR direct activation, while no alternative approaches are explored. The CE NRAs think that more flexibility should be allowed: only the main requisites of the fallback solution should be set (i.e. capability to cope with errors in FCR centralised controller and to compensate any frequency difference because of system split), leaving the FCR providers to define their own solution, either based on decentralised frequency measurements or on other smart approaches.

Moreover, the parameters governing the 4 years transitory period for FCR centralised controllers are given in absolute value (30 MW under the same controller and 75 MW in a single LFC block), while a link with the reference incident should be more opportune to allow an automatic adaption in case the reference incident is updated.

LER definition

The LER definition proposed in the FCR additional properties is significantly different from the LER definition reported in the assumptions for the cost benefit analysis (hereinafter referred to as: CBA) to identify the minimum delivery time period in alert state in accordance with Article 156(9) of SO GL approved by the CE NRAs in 2019[3]. Both definitions refer to a minimum period of continuous FCR activation (hereinafter referred to as: LER prequalification period), but:

a) the FCR additional properties consider a LER prequalification period equal to 2 hours, neglect the contribution of the Active Reservoir Management and don't have any reference to the level of the reservoir at the beginning;
b) the CBA refers to the effectively timeframe contracted by the TSO for FCR activation, includes the positive effect of the Active Reservoir Management and is based on the starting level of the reservoir.

The CBA definition would indeed lead to a better representation of the reality, considering the likeliness of a unit to limit its FCR activation because of effectively existing constraints on its reservoir. Up to this extent even a large water storage might be considered as LER if the available margin is low and the contracted FCR high. Nonetheless this definition is quite difficult to apply, since it requires monitoring the starting level of the energy reservoirs and the behaviour of the Active Reservoir Management.

[3] The decision was a joint one with the regulatory authorities of Nordic Synchronous Area.

The FCR additional properties approach is, instead, much easier to implement: each unit is assessed on the basis of its standard performances, avoiding modelling the effective initial status and given for granted that the Active Reservoir Management is capable to restore the reservoir after two hours as required by Article 156(13)(b) of SO GL.

The CE NRAs thus welcome the new approach and recommend the CE TSOs to adopt it while identifying the minimum delivery time period for LER FRC providing units in alert state. It is nonetheless worth noticing that the new definition doesn't require to rerun the CBA: as yet remarked by the CE NRAs while approving the CBA, the LER definition doesn't affect the simulations, but it plays a role in assessing the results where the effective LER share in the system (evaluated according to the LER definition) shall be compared with the CBA scenarios.

LER additional requirements

The Active Reservoir Management is fundamental in order to allow LER FCR providing units and groups to provide FCR for an indefinite period in normal state in accordance with Article 156(9) of SO GL: the 0.8 ratio between prequalified power and rated power is an effective solution, but other equivalent approaches should be investigated as well.

The Reserve Mode is not described properly: the transition criteria are only drafted with a general reference to a combination of full and short-term frequency deviations. More details should be given. Moreover, this provision may lead to significant retrofitting cost for existing units since the already installed inverters may not be capable to implement this feature: a proper cost benefit analysis as the one foreseen for the requirements in the connection codes should be opportune. Besides for this feature the CE TSOs refer to inverters only, while there may be other technologies capable to ensure the same performance.

NRAs amendments

The CE NRAs deem that FCR additional properties shall be significantly amended to accommodate the concerns mentioned above. To this extent the CE NRAs intend to exploit the provisions of Article 5(6) of the Regulation 2019/942, requiring the NRAs to revise the terms and conditions and methodologies, where necessary. With a standard RfA there would be, in fact, the concrete risk for the proposal to come back under the responsibility of the CE NRAs: the new version should be, in fact, subject to a further TSOs' voting, and, given the previous experience in approving the original FCR additional properties, a qualified majority might not be reached by the prescribed deadline (i.e. two months); this might lead to a missing resubmission that, according to the amendments to SO GL to be published in the coming weeks, should lead to a direct revision by the CE NRAs.

The main changes applied to the FCR additional properties by the CE NRAs are:

a) including some definitions to improve the quality and the overall readability of the proposal;
b) clarifying that the reserve connecting TSO is responsible to check all the FCR requirements (both reported in SO GL and in the FCR additional properties) in the prequalification phase and by the mean of an ex-post monitoring; this provision is implicit in the proposal, but the CE NRAs deem opportune to mention it to avoid any further misunderstanding;
c) clarifying that the reserve connecting TSO shall assess the technical justifications about a delay larger than 2 seconds or about the impossibility to follow at least a linear rise and shall decide whether the unit or group can be qualified; any refusal shall be duly motivated and communicated to the FCR provider and relevant regulatory authority; these provisions are included in Article 155 of the SO GL, but the CE NRAs deem it opportune to have them mentioned in the FCR additional properties for sake of completeness;
d) clarifying that the LER FCR providing units or groups may not comply with the 0.8 ratio between prequalified power and rated power if an alternative solution with an equivalent effect in terms of Active Reservoir Management is in place;

e) foreseeing the compulsory implementation of the Reserve Mode only for the LER FCR providing units or groups prequalified for the first time after the entry into force of the FCR additional properties and that are based on technically capable technologies; the extension to already prequalified units or groups based on the same technically capable technologies may be recommended by each TSO at national level, subject to the same rules foreseen for existing units by Regulation 2016/631;
f) describing the standard requirements for the transition from the Normal Mode to the Reserve Mode and vice versa, allowing each TSO to define different requirements at national level;
g) clarifying that the local frequency measurement is compulsory for FCR providing units only as the main driver for FCR activation; for FCR providing groups, three alternatives are in place:
    i) local frequency measurements as for FCR providing units;
    ii) centralised controller with local frequency measurements to be used as a fallback;
    iii) centralised controller with an alternative fallback solution with the same equivalent effect of local frequency measurements, subject to a favourable opinion by the reserve connecting TSO;
h) expressing the parameter governing the operation of centralised controllers for 4 years after the entry into force of the FCR additional properties as a fraction of the reference incident.

TSOs and stakeholders' consultation

The CE NRAs discussed the amended FCR additional properties with the CE TSOs during bilateral interactions and in a proper hearing phase at the end of the process. The interaction was fruitful and lead to the wide acceptance of the proposed changes. Some further editorial comments were provided during the hearing phase and accommodated by the CE NRAs.

Before the formal hearing phase with the TSOs, three regulatory authorities run also a public consultation at national level. The stakeholders provided a number of suggestions and complains. Some hints about a proper link to national terms and conditions whenever a TSO decision is foreseen in the prequalification process or for the criteria ruling the Reserve Mode transition and about the need to clarify the scope of the Reserve Mode and of the fallback approach for centralised controllers were welcomed by the CE NRAs, while a number of other considerations were discarded because out of scope or already included in the proposal. More details about these latter suggestions and the reasons for which they were not considered are reported in Annex I.

IV. Conclusions

The CE NRAs have consulted and closely cooperated and coordinated with each other and with the relevant TSOs and ENTSO-E in order to amend and approve the FCR additional properties submitted by the CE TSO as outlined above and annexed to this decision paper in both clean (Annex II) and track change (Annex III) versions.

ANNEX I – ANSWERS TO STAKEHOLDER COMMENTS

EU-wide consultation

A EU-wide consultation was held by the CE TSOs on the ENTSO-E platform from 30 March 2018 to 03 May 2018. The consulted version encompassed a LER definition similar to the one already included in the assumption for the cost benefit analysis pursuant to Article 156(9) of SO GL, the LER requirements for the Active Reservoir Management and the Reserve Mode and some general provisions about autonomous activation of FCR when centralised controllers are in place and a system split and/or communication errors occur.

The version sent to the CE NRAs was indeed a bit different with respect to the consulted one. In particular, the CE TSOs:

a) changed the LER definition preferring a formulation easier to implement and no longer linked with the initial state of charge;
b) confirmed the LER provisions about Active Reservoir Management and the Reserve Mode, giving some more details;
c) explicated the concept of the autonomous activation of FCR by introducing the standard fallback approach based on decentralised frequency measurements.

The CE NRAs acknowledge that in the NRA decision process the FCR additional properties underwent significant changes and that the final version is different from both the originally consulted version and the originally submitted one. A new EU-wide consultation is nonetheless not foreseen by the European regulatory framework: the only public consultation should be run by the TSOs according to Article 11 of SO GL; the NRAs may indeed run consultations at national level and this opportunity was exploited by three different authorities between end October and November 2020.

Anyhow the amendments by the CE NRAs address most of the technical concerns raised by the stakeholders in the EU-wide consultation and not accommodated by the CE TSOs:

a) the reserve connecting TSO shall assess the technical justifications about a delay larger than 2 seconds or about the impossibility to follow at least a linear rise and shall decide whether the unit or group can be qualified; any refusal shall be duly motivated and communicated to the FCR provider and relevant regulatory authority;
b) the possibility to introduce alternative approaches for the Active Reservoir Management with respect to the 0.8 ratio between prequalified and rated power is clarified;
c) the Reserve Mode criteria are better explained and some flexibility is allowed also in this field;
d) the autonomous FCR activation may be ensured also by smart solutions to be subject to the reserve connecting TSO's approval and not only by a prescriptive fallback approach based on decentralised frequency measurements.

A number of legal concerns related to the right for the CE TSOs to apply additional properties to already qualified FCR providing units were provided in the EU-wide consultation as well: the stakeholders considered this choice as a retroactive application of the connection codes to existing units, decided without running a proper cost benefit analysis as foreseen by Regulation 2016/631. The CE NRAs cannot accept these concerns. Imposing FCR additional properties is allowed by SO GL even to already prequalified units according to article 2 of SO GL: this obeys to the need to update the FCR provisioning criteria in order to take into account the evolution of the system in terms of inertia, renewables and demand forecast. In addition, the requirements relate to the qualification of FCR and not to the connection to the grid, so they cannot be seen as a retroactive application of connection codes. In order to limit the impact of these update on the stakeholders, a transitional period is foreseen. Anyway the CE NRAs decided to limit the Reserve Mode provisions only to the LER FCR providing units that are qualified for the first time after the entry into force of the FCR additional properties: the extension to other units may be recommended by the CE TSOs subject to the same approach (i.e. cost benefit analysis) foreseen for the application of the requirements for generators to existing units in the Regulation 2016/631.

TSOs' leeway

The original FCR additional properties submitted by the CE TSOs were deemed too prescriptive by the CE NRAs: a proper flexibility was thus added to allow national TSOs to evaluate alternative approaches, especially with respect to the fallback approach and the criteria for the Reserve Mode transition.

As far prequalification is concerned, the new version of the FCR additional properties simply encompasses the provisions of Article 155 of SO GL: a restriction in the responsibility delegated to the reserve connecting TSOs would thus be legally unacceptable.

Anyway the CE NRAs included a specific reference to national terms and conditions wherever a leeway is granted to the TSOs: in this way the flexibility ensured by the FCR additional process is linked to the national regulatory framework, ensuring more transparency towards the stakeholders.

Unit based concept vs group based concept

The unit concept is defined in SO GL as the entity capable to provide FCR, FRR or RR under a single connection point. A group may be formed by grouping units and/or other technical entities incapable of stand-alone reserve provision.

The FCR additional properties are coherent with the above mentioned approach, listing the provisions the FCR providing units of groups shall match to be prequalified for FCR provision. This defines the content of the FCR service: it's then up to the stakeholders to identify the most suitable technologies and perimeter of aggregation.

Aggregators and fallback approach

The installation of fallback decentralised frequency measurements or of an alternative solution with an equivalent effect doesn't prevent the aggregators to form FCR a providing group to be managed by a centralised controller. The fallback provisions are introduced only to ensure that the FCR may still be activated in case of system split and/or communication errors hampering the ordinary operation of the centralised controller.

Smart fallback approaches

The formulation for the alternative solution to a fallback based on decentralised frequency measurements is deliberately left general in order to encompass any technologies and approaches, including, but not limited to, SIM and APN connections or geographically limited local measurement. The stakeholders are encouraged to interact with the reserve connecting TSO in order to demonstrate the effectiveness of the solution they intend to implement.

Moreover, the CE NRAs are aware that in some cases the decentralised frequency measurement is difficult to be implemented: in this case the stakeholders shall propose an alternative approach that may ensure a proper FCR activation even without a local frequency measure.

Reserve Mode

The original proposal submitted by the CE TSOs foresaw the Reserve Mode only for LER FCR providing units. The CE NRAs acknowledge the opportunity to shift or extend this provision to LER FCR providing groups, nonetheless this couldn't be achieved for this version of the FCR additional properties since a proper investigation should be run to understand how a centralised controller may ensure the Reserve Mode only when only some of its LER FCR providing units have reservoirs about to deplete. The CE NRAs will keep discussing the issue with the CE TSOs and, if opportune, they will endeavor to have a new version of the FCR additional properties issued.