Elia’s LFC block operational agreement

February 22, 2024

Contents

THE BELGIAN TRANSMISSION SYSTEM OPERATOR, TAKING INTO ACCOUNT THE FOLLOWING,

Whereas

1. This document is a proposal developed by Elia Transmission Belgium (hereafter referred to as “Elia”) regarding the methodologies and conditions included in the LFC block operational agreement (hereafter referred to as “LFCBOA”) for the Elia LFC block.
2. The Elia LFC block is determined in a common proposal developed by all Transmission System Operators (hereafter referred to as “TSOs”) of synchronous area Continental Europe (hereafter referred to as “CE”), regarding the development of a proposal for the determination of LFC blocks in accordance with Article 141(2) of Commission Regulation (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation (hereafter referred to as the “SOGL”)
3. The subject matter of the SOGL is to safeguard operational security, frequency quality and the efficient use of the interconnected system and resources as specified in Article 1 of the SOGL, including the rules aiming at the establishment of a Union framework for load-frequency control and reserves.
4. Article 119(1) of the SOGL lists the requirements of the LFCBOA for which all TSOs of each LFC block shall jointly develop common proposals by 12 months after entry into force of the SOGL. Elia is the only TSO operating in its LFC block and Elia’s proposal constitutes therefore a LFC block operational methodology proposed unilaterally by Elia.
5. At least those methodologies and conditions referred to under Article 119 of the SOGL, and detailed by Article 6(3)e of the SOGL and by the relevant national legislation have to be submitted for approval to the relevant regulatory authorities by application of Article 6(5) of the SOGL. Since Elia is the only TSO operating in its LFC block, Elia submits those proposals for methodologies and conditions for approval to the relevant national regulatory authority, i.e. CREG.
6. Elia consulted the stakeholders on the draft proposals in accordance with Article 11 of the SOGL.
7. The LFCBOA is compliant with the common proposals provided for under the Synchronous Area Operational Agreement developed by all TSOs of each synchronous area according to Article 118 of the SOGL, hereafter referred to as SAOA.

PRESENTS THE FOLLOWING PROPOSAL AFTER APPROVAL BY THE CREG:

Introduction

This LFC block operational agreement (hereafter referred to as “LFCBOA”), applies to the ELIA LFC block and contains the methodologies listed in Article 119 of Commission Regulation (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation (hereafter referred to as “SOGL”).

TITLE 1 General Provisions

Article 1. Objective

1. By dimensioning the frequency restoration reserve (hereafter referred to as FRR) and defining the processes to fulfil the frequency quality target parameters, the methodologies and conditions specified in this LFCBOA proposal contribute to the general objectives as defined in Article 4 of the SOGL to the benefit of all TSOs, the Agency, regulatory authorities, market participants and the end consumers. In particular, by determining the dimensioning rules for FRR and specifying the operational processes to fulfil the load-frequency obligations, the LFCBOA serves the objectives of:
    1. determining common operational security requirements and principles;
    2. determining common interconnected system operational planning principles;
    3. determining common load-frequency control processes and control structures;
    4. ensuring the conditions for maintaining operational security throughout the Union;
    5. ensuring the conditions for maintaining a frequency quality level of all synchronous areas throughout the Union;
    6. promoting the coordination of system operation and operational planning;
    7. ensuring and enhancing the transparency and reliability of information on transmission system operation;
    8. contributing to the efficient operation and development of the electricity transmission system and electricity sector in the Union.

Article 2. Timing for implementation

1. The implementation of the fallback procedure for aFRR dimensioning specified in Article 9(10) will enter into force on October 1, 2024 (delivery date) after approval of the CREG, together with the entry into force of the dynamic aFRR dimensioning methodology approved in the previous version of the LFCBOA, on July 19, 2023 (Decision B2538).

2. The implementation of the bidding obligation in Article 13(9) and 13(10) will enter into force on November 1, 2023 (delivery date), after approval of the CREG.

3. The modifications in Article 4, Article 7, Article 12 and Article 13 approved by CREG on July 19, 2023 (Decision B2538) will enter into force together with the modifications approved by CREG on February 10, 2022 (Decision B2344) including the reduction of the full activation time of mFRR to 12.5 minutes specified in Article 14 of the LFCBOA. The modifications in Article 4, Article 7, Article 12, Article 13 and Article 14 will enter into force

together with the entry into force of explicit bidding for mFRR balancing energy and the modification of the full activation time of mFRR in the version of the Terms and Conditions for Balancing Service Providers for Frequency Restoration Reserve with manual activation (mFRR), hereafter referred to as T&C BSP mFRR facilitating the accession of Elia to the mFRR platform.

4. The reduction of the full activation time of aFRR to 5 minutes specified in Article 14, approved by CREG on July 19, 2023 (Decision B2538) of the LFCBOA will enter into force together with the entry into force of the revision of the full activation time of aFRR in a next version of the Terms and Conditions for balancing service providers for Frequency Restoration Reserve with automatic activation (aFRR), hereafter referred to as T&C BSP aFRR.

Article 3. Definitions and interpretations

1. For the purposes of this proposal, the terms used have the meaning of the definitions included in Article 3 of the SOGL.
2. All references to other legislation is explicitly defined. All articles without explicit reference to other legislation concern articles in this LFCBOA.
3. Balancing Service Provider or BSP is defined according to Article 2(6) of the commission regulation (EU) 2017/2195 of 23 November 2017 establishing a guideline on electricity balancing.

Article 4. Subject

1. According to Article 119(1) of the SOGL, the LFC block operational agreement will contain proposals for the following methodologies :
    a. where the LFC block consists of more than one LFC area, FRCE target parameters for each LFC area defined in accordance with Article 128(4) of the SOGL;
    b. LFC block monitor in accordance with Article 134(1) of the SOGL;
    c. ramping restrictions for active power output in accordance with Article 137(3) and (4) of the SOGL;
    d. where the LFC block is operated by more than one TSO, the specific allocation of responsibilities between TSOs within the LFC block in accordance with Article 141(9) of the SOGL;
    e. if applicable, appointment of the TSO responsible for the tasks in Article 145(6) of the SOGL;
    f. additional requirements for the availability, reliability and redundancy of technical infrastructure defined in accordance with Article 151(3) of the SOGL;
    g. operational procedures in case of exhausted FRR or RR in accordance with Article 152(8) of the SOGL;
    h. the FRR dimensioning rules defined in accordance with Article 157(1) of the SOGL;
    i. the RR dimensioning rules defined in accordance with Article 160(2) of the SOGL;

j. where the LFC block is operated by more than one TSO, the specific allocation of responsibilities defined in accordance with Article 157(3) of the SOGL, and, if applicable, the specific allocation of responsibilities defined in accordance Article 160(6) of the SOGL;

k. the escalation procedure defined in accordance with Article 157(4) of the SOGL and, if applicable, the escalation procedure defined in accordance with Article 160(7) of the SOGL;

l. the FRR availability requirements, the requirements on the control quality defined in accordance with Article 158(2) of the SOGL, and if applicable, the RR availability requirements and the requirements on the control quality defined in accordance with Article 161(2) of the SOGL;

m. if applicable, any limits on the exchange of FCR between the LFC areas of the different LFC blocks within the CE synchronous area and the exchange of FRR or RR between the LFC areas of an LFC block of a synchronous area consisting of more than one LFC block defined in accordance with Article 163(2), Article 167 and Article 169(2) of the SOGL;

n. the roles and the responsibilities of the reserve connecting TSO, the reserve receiving TSO and of the affected TSO for the exchange of FRR and/or RR with TSOs of other LFC blocks defined in accordance with Article 165(6) of the SOGL;

o. the roles and the responsibilities of the control capability providing TSO, the control capability receiving TSO and of the affected TSO for the sharing of FRR and RR defined in accordance with Article 166(7) of the SOGL;

p. roles and the responsibilities of the control capability providing TSO, the control capability receiving TSO and of the affected TSO for the sharing of FRR and RR between synchronous areas in accordance with Article 175(2) of the SOGL;

q. coordination actions aiming to reduce the FRCE as defined in Article 152(14) of the SOGL;

r. measures to reduce the FRCE by requiring changes in the active power production or consumption of power generating modules and demand units in accordance with Article 152(16) of the SOGL.

2. According to Article 119(1) of the SOGL, the methodologies and conditions in a., d., e., g., i., j., k., m. and n. are without application for the Elia LFC block :

a. Elements under a., d., e. and j. are not applicable as Elia is the only TSO in the Elia LFC block, or due to the fact that the LFC block consists in only one LFC area.

b. The element under f. is not applicable as Elia does not apply additional requirements on technical infrastructure other as defined in the SAOA following Article 151(2) of the SOGL.

c. The element under m. is not applicable as Elia does not apply additional limits on the exchange on FCR with other LFC blocks other as the limit specified in Article 163(2) of the SOGL.

d. The element under i. is not applicable as RR is currently not applied in the Elia LFC block.

e. The element under n. is not applicable as reserve exchange for FRR or RR is currently not applied in the Elia LFC block.

3. According to Article 6(3)e of the SOGL, the methodologies and conditions determined in c., h., q. and r. of Article 119 of the SOGL shall be submitted to the CREG for approval. The methodologies and conditions in c., q. and r. are specified in Title 2, while the methodology in h. is specified in Title 3.

4. The methodologies and conditions in b., l., k., o., g., and p. of Article 119 of the SOGL are specified in Title 4.

5. The methodologies and conditions in g., k., q. of Article 119 of the SOGL are respectively specified in Article 7, Article 12 and Article 13.

    a. Timing and high level goal of each measure is specified as:

        i. operational procedures for exhausted FRR specified in Article 152(8) of the SOGL which aims to access additional reserves when (risk of) depleting reserves following events not fully accounted in the FRR needs. This procedure can be used between the day-ahead until close to real-time ;

        ii. escalation procedure for FRR specified in Article 157(4) which aims to access additional reserve capacity when (risk of) not adequately covering the dimensioned needs. This procedure can be used between the day-ahead until close to real-time ;

        iii. measures to reduce FCRE specified in Article 152(16) which aims to procedure when facing high FRCE values. This procedure can only be used in real-time.

    b. “Units” which cannot be activated in compliance with the FRR processes may only be activated by ELIA via the following separate measures: operational procedures for exhausted FRR (cf. Article 12), an escalation procedure for FRR (cf. Article 13) and measures to reduce the FRCE (cf. Article 7).

    c. Measures related to emergency conditions are defined in the methodologies compliant with Commission Regulation (EU) 2017/2196 of 24 November 2017 establishing a network code on electricity emergency and restoration and are not in the scope of this LFCBOA. Measures related to the normal activation procedures of reserve capacity are compliant with the reserve process activation structure specified in Article 140 of the SOGL and are not in the scope of this LFCBOA. Measures related to the procedures for exhausted FCR are specified in the synchronous area operational agreement in line with Article 157(7) of the SOGL.

TITLE 2 Methodologies referred to under Article 6(3)e of the SOGL

Article 5. Ramping restrictions for active power output in accordance with Article 137(3) and (4) of the SOGL

1. Rules for ramping restrictions on the active power output of each HVDC interconnector between a LFC Block of another synchronous area and the Elia LFC block, in accordance with SOGL Article 137(3):

    a. Elia and the other connecting TSOs supervising a LFC block of an HVDC interconnector shall have the right to determine common ramping restrictions in the form of ramping periods and/or maximum ramping rates and shall enter into agreement with the TSOs responsible for operating the interconnector, to determine the processes and mechanisms by which these restrictions will be put in place. These ramping restrictions shall not apply to imbalance netting, frequency coupling, cross-border activation of FRR or cross-border activation of RR. These ramping restrictions shall not apply to any service aimed at maintaining or returning one of the connected electricity systems to a normal system state. The common restriction shall also take into account the restrictions set in the SAOA for CE in accordance with SOGL Article 137(1), if applicable;

    b. The ramping restrictions for each interconnector shall be applied in a non-discriminatory manner. Elia shall ensure alignment of ramping restrictions between all HVDC interconnectors linking the same two synchronous areas, taking into account the technical capabilities of each HVDC interconnector. A ramping rate of 100MW/min shall be applied on all interconnectors between Elia LFC block and the LFC block of Great-Britain;[1]

    c. A summary of the ramping restrictions to be applied to HVDC interconnectors connecting to the Elia LFC Block, shall be published by ELIA on its website at least one week before the rules are enforced, in accordance with the obligations in SOGL Article 8;

    d. Unless such action would lead Elia to be in emergency state, Elia will accept a request of the TSO of the LFC block of Great-Britain to restrict equitably the ramp rates of all interconnectors between ELIA LFC block and the LFC block of Great-Britain, in coordination with the affected interconnector operators according to the terms referred to paragraph (a) of this Article. This is typically the case if the requesting TSO is in emergency state or declares itself in emergency state as soon as practically reasonable or expects to enter into emergency sate if no actions are taken. The activation of such measure is justified and analysed ex post by Elia.

    e. Within 30 calendar days of an incident which restricted one or more of the HVDC interconnectors, under the process referred to in paragraph (d), Elia shall prepare a report containing an explanation of the rationale, implementation and impact of this action and submit it to the relevant regulatory authority in accordance with

[1] An LFC Block is defined in Article 3 of the SOGL. This terminology is also used for the control zone of Great Britain in case of a Brexit.

Article 37 of Directive 2009/72/EC and neighbouring TSOs, and also make the report available to all significantly affected system users.

2. Measures to support the fulfilment of the FRCE target parameter of the LFC block and to alleviate deterministic frequency deviations, in accordance with SOGL Article 137(4): Elia currently does not implement technological restrictions of power generating modules and demand units to support the fulfilment of the FRCE target parameters of the LFC block and to alleviate deterministic frequency deviations.

Article 6. Coordinated actions aiming to reduce the FRCE as defined in Article 152(14) of the SOGL

1. Elia is the only TSO in the Elia LFC block. The requirement to inform other TSOs of the LFC block and implement coordinated actions to reduce the FRCE, as defined in Article 3 of the SOGL, following violations of FRCE limits defined in Article 152(12) and (13) of the SOGL, is not applicable to the Elia LFC block.

Article 7. Measures to reduce the FRCE by requiring changes in the active power production or consumption of power generating modules and demand units in accordance with Article 152(16) of the SOGL

1. Under the measures to reduce the FRCE, ELIA mitigates close to real time a high and enduring FRCE which is not expected to be controlled by the frequency restoration process as defined in Article 143 of the SOGL, nor by means of the mitigation measures as part of the operational procedures for exhausted FRR (cf. Article 12) and/or of the escalation procedure for FRR (cf. Article 13). The measures to reduce the FRCE are activated if Elia observes :
    a. as specified in Article 152(12), the 1-minute average of the FRCE of a LFC block going above the Level 2 FRCE range at least during the time necessary to restore frequency and where the TSOs of a LFC block do not expect that FRCE will be sufficiently reduced by undertaking the actions as specified in Section B-9-1 of the synchronous area operational agreement in accordance Article 152(15) of the SOGL ;
    b. as specified in Article 152(13), the FRCE of a LFC block exceeding 25 % of the reference incident of the synchronous area for more than 30 consecutive minutes and where the TSOs of that LFC block do not expect to reduce sufficiently the FRCE with the actions taken pursuant to Article 152(15) of the SOGL and specified in Section B-9-1 of the synchronous area operational agreement.
2. Within this procedure, ELIA may :
    a. publish a balancing warning communication asking all BSPs to submit additional FRR non-contracted balancing energy bids and informing all BRPs such that they can adapt injections and off-take in their portfolio accordingly;
    b. activate remaining energy on FRR balancing energy bids which is available but which could no longer be selected for activation on the balancing energy exchange platforms;

c. activate units subject to the Terms and Conditions Scheduling Agent, in line with Article 130 of the Code of Conduct, and that cannot be activated via the FRR processes;

d. activate units that do not provide MW schedules in the context of the Terms and Conditions Scheduling Agent, that cannot be activated via the FRR processes and that offer their available active power on a voluntary basis.

e. request changes in the active power production or consumption of power generating modules and demand units within their area.

3. For taking the measures specified in paragraph 2(c) and 2(d), Elia will strive towards techno-economic efficiency by taking into account the maximum and minimum output, start-up time, start-up costs and other technical constraints if relevant.

4. The flexibility activated by ELIA via this procedure is limited to the capacity needed to bring the large FRCE back to an acceptable level (i.e. below the conditions specified in Article 152(12) and 152(13) of the SOGL).

5. Elia shall prepare, at least on annual basis, an overview with a list of events following the triggers specified in paragraph 1, as well as a short motivation on the use of one or more measures specified in paragraph 2.

6. At the latest 15 working days after the use of one of the measures specified in paragraph 2(b), 2(c), 2(d) or 2(e), ELIA shall prepare a report containing a description and justification for this action and submit it to the CREG. The report shall at least contain:

    a. a description of the exceptional event;

    b. the result of the evaluations carried out in accordance with paragraph 1, including the values of the parameters mentioned and the timing of those evaluations;

    c. the energy activated per unit and per 15 minute balancing energy market time unit and the attained techno-economic efficiency in accordance with paragraph 3, including a justification for deviating from the techno-economic optimum, if applicable;

    d. the lessons learned from the exceptional event and, if relevant :

        i. concrete recommendations that could ease the management of the following exceptional events;

        ii. actions Elia intends to take, or is taking, in order to verify or enforce the compliance of market parties with their contractual obligations towards Elia.

TITLE 3 FRR dimensioning rules in accordance with Article 157 and Article 6(3)e of the SOGL

Article 8. Dimensioning rules for reserve capacity on FRR

1. Elia dimensions the required reserve capacity on FRR on a daily basis in accordance with the minimum criteria set out in Article 157(2) SOGL on the basis of the maximum value resulting from:

a) a dynamic **probabilistic methodology** further specified in paragraphs 2 to 6 and in line with Article 157(2)b of the SOGL;

b) a dynamic **deterministic methodology** based on the dimensioning incident further specified in paragraph 8 and in line with Article 157(2)e and 157(2)f of the SOGL;

c) a **minimum threshold** based on the historic LFC block imbalances further specified in paragraph 9 and in line with Articles 157(2)h and 157(2)i of the SOGL.

2. The probabilistic methodology is based on a convolution of two distribution curves, one representing the **prediction risk** (paragraph 3) and another representing the **forced outage risk** (paragraph 5). This methodology has been designed to cover 99.0% of the LFC block imbalance risk. After the convolution, the new distribution is decomposed in a distribution of potential positive LFC block imbalances, and a distribution of potential negative LFC block imbalances. This calculation is conducted for each-quarter hour of the next day, and the 99.0% percentile of each probability distribution curve determines the minimum positive and negative required reserve capacity.

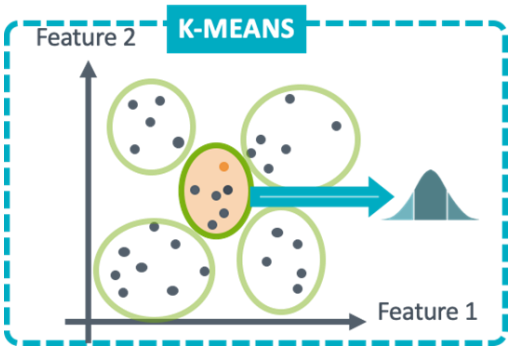
3. The probability distribution representing the **prediction risk (PE)** is based on historic LFC block imbalances. The LFC block imbalances are based on consecutive historical records with a resolution of 15 minutes and includes a period of two years, ending not before the last day of the second month before the month of the day for which the reserve capacity is calculated. The time series is filtered to remove periods with a forced outage of NEMO Link or generating units with a loss of power larger than 50 MW (until the end of the forced outage but limited to 8 hours after the start of the forced outage), periods with exceptional events (e.g. market decoupling) and periods with data quality problems (e.g. missing data).

4. The prediction risk is modelled for each quarter-hour of the next day based on the probability distribution of the LFC block imbalances specified in paragraph 3. Four methodologies to determine this selection of LFC block imbalances are implemented:

a) **STATIC PE** in which the probability distribution of the LFC block imbalances is determined once per month (the month before the month of the day for which the reserve capacity is calculated) based on all historical records specified in paragraph 3. The distribution remains constant and valid for the next month.

b) **KMEANS PE** in which the historical records specified in paragraph 3 are categorized in a set of clusters. These clusters are determined the month before the month of the day for which the reserve capacity is calculated based on a predefined list of 8 features (i.e. categories of observations that exhibit system conditions: the prediction of generation and variations of onshore wind, offshore wind, photovoltaic, the prediction of total load and its variations, as well as the predicted temperature and time of day (i.e. categories of observations that exhibit system conditions: the prediction of generation and variations of onshore wind, offshore wind, the prediction of generation of photovoltaic capacity, the prediction of total load and its variations, as well as the predicted temperature and time of day). To determine the set of clusters, a “k-means clustering” machine learning algorithm

is used[2]. The k-means algorithm allocates a set of all observation in the historical records specified in paragraph 3 into disjoint clusters, each described by the mean μ_j of the observations in the cluster, such that the within-clusters sum-of-squares is minimized for the above-mentioned features. This is illustrated in the following figure for a simplified case with 5 clusters and 2 features. The implementation considers 15 clusters.



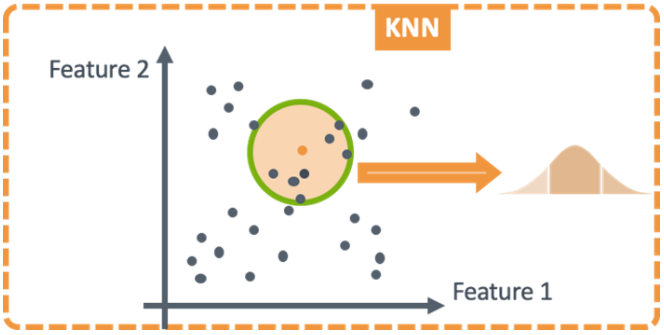
$$\sum_{i=0}^{n} \min_{\mu_j \in C} (||x_i - \mu_j||^2)$$

In each cluster, the probabilistic distribution of LFC block imbalances of the periods associated with each cluster is calculated. During the day-ahead calculation of the FRR reserve capacity needs, it is determined for each quarter-hour to which cluster the corresponding day-ahead prediction of features is associated. This determines the relevant LFC block imbalance distribution representing the prediction risk.

c) **KNN PE** in which the historical records specified in paragraph 3 are categorized based on an unsupervised nearest neighbour algorithm[3]. The principle behind nearest neighbor methods is to find a predefined number of training samples closest in distance to the new point, and use them to predict the value of this new point. The number of samples is a user-defined constant (k-nearest neighbor learning, i.e. 3500). This distance is calculated based on the same predefined list of features as with KMEANS PE This method is illustrated on the following figure with 7 neighbors and 2 features, the orange dot being one of the periods being sized.

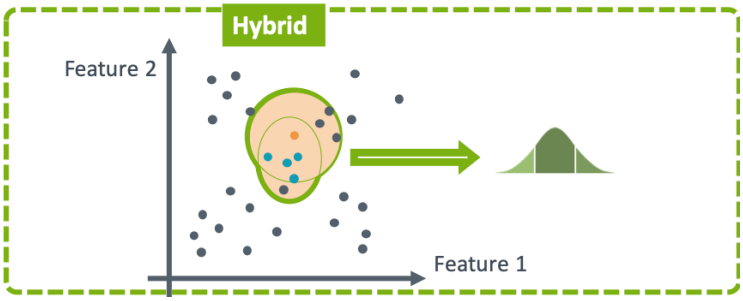
[2]Specified in the Scikit-learn library for Python programming. https://scikit-learn.org/stable/modules/generated/sklearn.cluster.KMeans.html where parameters are determined as: sklearn.cluster.KMeans(n_clusters=15, random_state=0). All other parameters are set at their default value.

[3]Specified in the Scikit-learn library for Python programming https://scikit-learn.org/stable/modules/generated/sklearn.neighbors.NearestNeighbors.html#sklearn.neighbors.NearestNeighbors where parameters are determined as: sklearn.neighbors.NearestNeighbors (n_neighbours=3500). All other parameters are set at their default value.



During the day-ahead calculation of the FRR reserve capacity needs, the relevant LFC block imbalance distribution representing the prediction risk is calculated based on the relevant 3500 nearest neighbours.

d) **HYBRID PE** method combines KMEANS PE and KNN PE method where observations belonging to the relevant cluster of the KMEANS PE calculation and to the relevant neighbourhood of the KNN PE calculations are used to determine the probability distribution, as illustrated on the figure below. Some observations (blue dots) are selected by both KNN and KMEANS methods, whereas other observations are selected by only one of the two methods (black dots in orange areas).



To avoid giving more weight to features with large order of magnitude, the distance between two observations in KMEANS PE and KNN PE is computed as the Euclidean distance between the corresponding vector of features: $d(obs_1, obs_2)^2 = \sum_{j=1,\dots,\#features}(f_{1,j} - f_{2,j})^2$.. Therefore, each feature is scaled by means of a normal scaler and defined as $f_{i,j,scaled} = \frac{f_{i,j} - mean(f_{all,j})}{std(f_{all,j})}$ where $f_{i,j}$ is the value of unscaled feature *j* for the *i*-th observation, and $f_{all,j}$ is the set of all observations of feature *j*.

All probability distributions of the LFC block imbalances used in this paragraph have been modelled with a **Kernel Density Estimator**[4] with imbalance steps of 5 MW (from -2500 MW to 2500 MW)[5].

[4] Specified in the Scikit-learn library for Python programming https://scikit-learn.org/stable/modules/generated/sklearn.neighbors.KernelDensity.html#sklearn.neighbors.KernelDensity where parameters are determined as klearn.neighbors.KernelDensity(bandwidth=rule of thumb, kernel='cosinus')

[5] Specified in the Scikit-learn library for Python programming https://scikit-learn.org/stable/modules/generated/sklearn.neighbors.KernelDensity.html#sklearn.neighbors.KernelDensity where parameters are determined as KernelDensity(bandwidth="rule of thumb", kernel='cosinus'). All other "Rule of thumb" is specified in https://en.wikipedia.org/wiki/Kernel_density_estimation#A_rule-of-thumb_bandwidth_estimator

5. To calculate the probability distribution representing the **forced outages risk (FO),** a distribution curve is calculated representing the probability to face a shortage or surplus capacity following forced outages (including HVDC-interconnectors with Great Britain). This is based on two approaches:

   a) **STATIC FO** in which the probability distribution curve is determined analytically once a month taking into account the rated capacity of each generation unit larger than 50 MW and the rated capacity of the interconnectors with Great-Britain, the duration with which a forced outage is assumed to impact the LFC block imbalance is assumed to be 8 hours and the probability (expressed below as forced outages per year) per technology type of facing a forced outage:

Technology type	Forced outages per year
Nuclear	1.6
Classical	6.1
CCGT	5.2
GT	2.8
TJ	2.2
Waste	1.3
CHP	3.5
Pumped storage	1.9
NEMO-link (per side)	2.0

   b) **DYNAMIC FO** where the probability distribution curve is determined analytically on daily basis for each quarter-hour of the next day taking into account:

   - the available capacity of each generation unit taking into account latest information concerning the rated capacity and unavailability of (part of) the installed capacity due to unavailability known at the moment of prediction ;
   - the predicted schedule of the HVDC-interconnector for the next day based on a prediction of the real-time flow between Great Britain and Belgium. This is derived from the algorithm specified in paragraph 6. Also limitations on maximum capacity, known at the time of the prediction, are taken into account;
   - the probability of outage and duration of impact of a forced outage on the LFC block imbalance is the same as in the STATIC FO.

6. The real-time flow between Belgium and Great Britain is determined for each-quarter-hour of the next day based on a machine learning method taking into account total demand, wind and photovoltaic forecasts. For each quarter-hour the next day:

   - Import flow ≥ 50 MW, the interconnector is considered in import ;
   - Export flow ≤ 50 MW, the interconnector is considered in export ;
   - Flow < 50 MW, the interconnector is considered as uncertain and both import and export direction are covered.

7. Elia will determine the reserve capacity needs for every quarter-hour based on the convolution of the HYBRID PE-method and DYNAMIC FO method. If a technical problem occurs with the calculation of the prediction risk, Elia will fall back first to a KNN PE-method and thereafter to a STATIC PE-method. Similar, if due to technical reasons, the DYNAMIC FO-method is not available, the STATIC FO-method is taken. The STATIC FO-method combined with the STATIC PE method will be the monthly fall-back value.

8. For each-quarter hour of the next day Elia determines the required positive and negative reserve capacity on FRR in order that it is never less than the positive and negative **dimensioning incident** of the LFC block, as specified in Article 3 and Article 157(2)d of the SOGL. The potential cut-out of the offshore wind power park following a storm is not considered as dimensioning incident. The dimensioning incident is determined for each quarter-hour of the next day:

    a. for the positive dimensioning incident based on the highest value of available power of a generating unit (taking into account unavailability and maximum capacity modifications known at the time of the day-ahead dimensioning) or the predicted schedule of the HVDC-interconnector with Great-Britain (taking into account unavailability and capacity reductions known at the time of the day-ahead dimensioning), determined in paragraph 6;

    b. for the negative dimensioning incident based on the predicted schedule of the HVDC-interconnector with Great-Britain taking into account unavailability and capacity reductions known at the time of the day-ahead dimensioning), determined in paragraph 6.

9. For each-quarter hour of the next day, Elia determines the required positive and negative reserve capacity on FRR in order that it is sufficient to cover at least the positive and negative **historic LFC block imbalances** for 99.0% of the time in line with Articles 157(2)h and 157(2)i of the SOGL. These thresholds are determined based on the consecutive historical records specified in paragraph 3, after correcting these values with imbalance netting, and before removal of any periods as discussed in paragraph 3.

10. Pursuant to Article 157(2)b of the SOGL, Elia ensures to respect the current **FRCE criteria** in Article 128 of the SOGL. This analysis is conducted ex post based on the reporting on FRCE quality specified in Article 11.

11. The required positive and negative reserve capacity on FRR is calculated each day before 7 AM for every period of 4 hours of the next day by means of the maximum value of the positive and negative reserve capacity on FRR over all quarter-hours of the corresponding period.

12. Pursuant Article 157(4) of the SOGL, TSOs of a LFC block shall have sufficient positive and negative reserve capacity on FRR at any time in accordance with the FRR dimensioning rules.

Article 9. Determination of the ratio of automatic FRR and manual FRR

1. Pursuant to Article 157(2)c of the SOGL, the TSO of a LFC block shall determine the ratio of automatic FRR (hereafter referred to as aFRR), manual FRR (hereafter referred to as mFRR), the aFRR full activation time and mFRR full activation time in order to comply with the requirement of Article 157(2)b of the SOGL.

    a) Elia determines the automatic FRR full activation time and manual FRR full activation time in Article 14.

    b) The required reserve capacity for FRR is determined by means of the probabilistic methodology described in Article 8(2).

2. Elia dimensions the required reserve capacity on aFRR on a daily basis based on a **dynamic probabilistic methodology** further specified in paragraphs 3 to 7. The results of this method are adapted by means of a **feedback loop** in function of the performance of the Elia LFC block on the FRCE target parameters further specified in paragraph 8.

3. The probabilistic methodology is based on a forecast of the **aFRR activation risk** for every period of 5 minutes of the next day. The prediction is based on a Gradient Tree Boosting algorithm which is a type of machine learning algorithm based on an ensemble of individual decision trees. Each decision tree represent "if-else statements" that are used to predict the aFRR activation risk. The algorithm is trained on a set of **simulated aFRR activations** (calculated based on historical observations of system imbalances and imbalance netting) and corresponding system conditions. The list of system conditions used for the training and prediction of the machine learning algorithms are the same as those for the dimensioning of FRR and specified in Article 8(4)b.

4. A Gradient Tree Boosting is trained to forecast the aFRR activation risk, using a quantile loss function. A separate model is built for the prediction of the positive simulated aFRR activations through the 99% percentile of the probability distribution of the positive simulated aFRR activations, and another model is built for the prediction of the negative simulated aFRR activations through the 1% percentile of the probability distribution of the negative simulated aFRR activations. Nodes are split based on a classical mean squared error with improvement score by Friedman. The number of trees is set at 400, the height of each tree is specified at 4 and the learning rate is fixed at 0.1.

5. The **simulated aFRR activations** ($aFRR_t$) are calculated with a resolution of 5 minutes based on historical observations of system imbalances and imbalance netting for a period of two years, ending not before the last day of the second month before the month of the day for which the reserve capacity is calculated. The time series are filtered to remove periods with a forced outage of Nemo Link or generating units with a loss of power larger than 50 MW (until the end of the forced outage but limited to 8 hours after the start of the forced outage), periods with exceptional events (e.g. market decoupling) and periods with data quality problems (e.g. missing data).

6. The **simulated aFRR activations** ($aFRR_t$), positive (negative) values represent upward (downward) activations are calculated for every period of 5 minutes as the difference between the system imbalance (SI_t), the simulated mFRR activations ($mFRR_t$) and the IGCC activations ($IGCC_t$): $-aFRR_t = SI_t + mFRR_t + IGCC_t$:

    a) the system imbalances (SI_t) are calculated as the average of the observed 1' system imbalances over each block of 5 minutes. Negative (positive) values represent system shortage (excess);

    b) the simulated mFRR activations ($mFRR_t$) are calculated as the average of the 1' system imbalance over each block of 15 minutes. Positive (negative) values represent upward (downward) activations ;

    c) the IGCC corrected activations ($IGCC_t$) are calculated based as the average of the 1' observed IGCC activations ($iGCC\_obs_t$) over each block of 5 minutes where positive (negative) values represent import (export) positions. The $IGCC_t$ is corrected to zero when $IGCC_t$ and $SI_t + mFRR_t$ are found to have the same sign and

i) $\text{Min}(IGCC\_obs_t; -(SI_t + mFRR_t))$ if $SI_t + mFRR_t \leq 0$

ii) $-\text{Min}(-IGCC\_obs_t ; SI_t + mFRRt)$ if $SI_t + mFRR_t > 0$

7. The up- and downward aFRR activation risk is determined each day before 7 AM for every period of 5 minutes of the next day based on predicted system conditions of the next day as specified in Article 8(4)b. The aFRR needs for that day are therefore determined by means of the average value of the positive (negative) reserve capacity on aFRR over all periods of 5 minutes of the corresponding period.

8. The feedback loop determines the final aFRR needs for the next day by multiplying the aFRR needs determined in line with paragraph 7 with:

    a) The yearly FRCE performance correction which equals the FRCE performance over a rolling period of 12 months, ending at the end of the month before the calculation of the aFRR needs. The correction is calculated as the maximum, corresponding to the lowest performance, of the yearly performance on the level 1 and level 2 range, calculated following Article 128(3) of the SOGL and expressed as percentage of the level 1 and level 2 target parameters specified in the same Article 128(3) of the SOGL, after taking into account a correction of 80% of the target values. The yearly performance correction is floored / capped at 80 % / 120%.

    b) The monthly FRCE performance correction equals the FRCE performance of the previous month calculated as the maximum of the monthly performance on the level 1 and level 2 range, calculated based on the same principles as stated in Article 128(3) of the SOGL and expressed as percentage of the level 1 and level 2 target parameters specified in the same Article 128(3) of the SOGL, after taking into account a correction of 80% of the target values. The monthly performance correction is floored / capped at 80 % / 120%.

9. The daily variations are limited by flooring / capping the final aFRR needs specified in paragraph 8 at 64% / 144% of the average aFRR needs resulting from the dynamic probabilistic methodology specified in paragraph 2 and this over period of 12 months ending one month before the month of the day for which the aFRR needs are calculated.

10. If a technical problem occurs with the calculation, Elia will fall back to fixed values calculated the month before the day for which the reserve capacity is calculated:

    a. for upward aFRR needs calculated as the 99% percentile of the probability distribution of the positive simulated aFRR activations based on historical observations of system imbalances and imbalance netting for a period of two years, ending one month before the month of the day for which the reserve capacity is calculated, as specified in paragraph 5 and 6 after which the correction factors are applied determined as specified in paragraph 8;

    b. for downward aFRR needs calculated as the 1% percentile of the probability distribution of the negative simulated aFRR activations based on historical observations of system imbalances and imbalance netting for a period of two years, ending one month before the month of the day for which the reserve capacity is calculated, as specified in paragraph 5 and 6 after which the correction factors are applied as specified in paragraph 8;

Article 10. Determination of the reduction of reserve capacity on FRR following the sharing of FRR

1. Pursuant to Article 157(2)j of the SOGL, the TSOs of an LFC block may reduce the positive reserve capacity on FRR of the LFC block resulting from the FRR dimensioning process by concluding a sharing agreement with other LFC blocks in accordance with provisions in Title 8 of the SOGL. Elia takes into account the restrictions specified in Article 157(2)j of the SOGL for the CE synchronous area:
    a. the reduction of the positive reserve capacity shall not exceed 30% of the size of the positive dimensioning incident ;
    b. the reduction of the positive reserve capacity on FRR of a LFC block shall be limited to the difference, if positive, between the size of the positive dimensioning incident and the reserve capacity on FRR required to cover the positive LFC block imbalances during 99.0% of the time based on the historical records referred to in Article 157(2)a of the SOGL. This corresponds to difference between the result of the deterministic methodology and the minimum threshold specified in Article 8(1)c.
2. Pursuant to Article 157(2)k of the SOGL, the TSOs of a LFC block may reduce the negative reserve capacity on FRR of the LFC block, resulting from the FRR dimensioning process by concluding a FRR sharing agreement with other LFC blocks in accordance with the provisions of Title 8. ELIA takes into account the restrictions specified in Article 157(2)k of the SOGL for the CE synchronous area:
    a. in periods when Nemo Link is foreseen to be in export, or when the prediction is indecisive, the reduction of the negative reserve capacity on FRR of a LFC block shall be limited to the difference, if positive, between the size of the negative dimensioning incident and the reserve capacity on FRR required to cover the negative LFC block imbalances during 99.0% of the time based on the historical records referred to in Article 157(2)a of the SOGL. This corresponds to the difference between the result of the deterministic methodology and the minimum threshold specified in Article 8(1)c.
    b. in periods when Nemo link is foreseen to be in import, or in maintenance, the reduction of the negative reserve capacity on FRR of the LFC block shall be limited to 0 MW.
3. Pursuant to Article 157(2)g of the SOGL, Elia can determine possible geographical limitations for sharing of reserves with other LFC blocks to comply with the operational security limits (represented by the remaining ATC after intra-day). Elia also take into account the restrictions defined in the FRR sharing agreements due to possible violations of operational security (network congestions within Elia's LFC block) and the FRR availability requirements (availability of the sharing service) as specified in Article 157(2)b.
4. In accordance with Article 166(3) of the SOGL, the reserve capacity available for FRR sharing shall be determined in an agreement with each TSO. Elia also defines the tasks and responsibilities of the control capability providing TSO, the control capability receiving TSO and the affected TSO for sharing FRR as specified in Article 166(7) of the SOGL

(parts of FRR within the synchronous zone) and Article 175(2) SOGL (parts of FRR between synchronous zones) in Article 15.

TITLE 4 Methodologies in accordance with Article 119, but not referred in Article 6 of the SOGL

Article 11. LFC block monitor in accordance with Article 134(1) of the SOGL

1. Following article 134(1) of the SOGL, Elia, as only TSO of the Belgian LFC block, is appointed as LFC Block Monitor. In its role as LFC Block Monitor, Elia collects the frequency quality evaluation data for the LFC block in accordance with the criteria application process referred to in Article 129 of the SOGL.
2. Besides relevant ENTSO-E publications, Elia will provide the relevant national regulatory authority with a yearly report on FRCE quality in the framework of its reserve reporting, as well as a monthly reporting on FRCE quality as part of its reporting on the balancing mechanism.

Article 12. Operational procedures in case of exhausted FRR in accordance with Article 152(8) of the SOGL

1. As referred to in Article 152(8) of the SOGL, ELIA specifies the operational procedures for cases of exhausted FRR. In this operational procedure ELIA has the right to require changes in the active power production or consumption of power generating modules and demand units.

2. The operational procedure described in paragraph 1 shall be activated only when Elia detects an exceptional event which has not been fully taken into account in the FRR needs.

3. As from the detection of an upcoming exceptional event specified in paragraph 2(a), for each 15 minute balancing energy market time unit during which the exceptional event is expected to impact the FRCE in the LFC Block, Elia continuously evaluates the residual risk by subtracting (b) and (c) from (a), with :

    a. the volume at risk, which is calculated as the possible loss of injection / increase of off-take following the event, corrected with mitigation measures if applicable. For sea storm events, the calculation method is described in Appendix 6 of the BRP Contract. For yet unidentified events, a description containing a calculation method to cover the volume risk will be submitted for approval to the CREG within one year after the event.

    b. available balancing means which are calculated as the sum of :

        i. the procurement of balancing capacity within control area and exchange of balancing capacity with neighbouring TSOs, when applicable pursuant to article 32(1)a of the EBGL,

        ii. sharing of reserves, when applicable pursuant to Article 32(1)b of the EBGL,

        iii. the volume of balancing energy bids which are not contracted by Elia and which are expected to be available both within its control area and within the European platforms taking into account the available cross-zonal capacity pursuant to Article 32(1)c of the EBGL.

c. the expected impact of the operational procedures for the alert state due to a violation of system frequency limits, as specified in the synchronous area operation agreement pursuant article 152(10) SOGL and article 152(15) SOGL.

4. When during two or more consecutive periods specified by the 15 minute balancing energy market time unit, the residual risk, as calculated in paragraph 3, exceeds the Level 2 FRCE range, for these periods, Elia may :

   a. publish balancing warning communication with the aim of :

      i. asking all BSPs to submit additional FRR non-contracted balancing energy bids;
      ii. informing all BRPs such that they can adapt injections and off-take in their portfolio accordingly;

   b. activate units which are available in line with requirements of the T&C Scheduling Agent, in line with Article 130 of the Code of Conduct, and that cannot be activated via the FRR processes. Once these units are activated, they facilitate the availability of balancing energy bids on these units via the FRR processes;

   c. activate units that do not provide MW schedules in the context of the Terms and Conditions Scheduling Agent, that cannot be activated via the FRR processes and that offer their available active power on a voluntary basis.

5. The measures specified in paragraphs 4(b) and 4(c) will be taken at the latest point in time for Elia to take action while taking into account the latest available information following the balancing warnings and the communications with BRP contributing to the residual risk specified in paragraph 3, Elia will strive towards techno-economic efficiency by taking into account the duration and magnitude of the definite risk and the maximum and minimum output, start-up time, start-up costs and other technical constraints if relevant.

6. The measures specified in paragraphs 4(b) and 4(c) are effectively activated taking into account the start-up time or activation time of the selected units in order to control the FRCE during the periods with definite risk as specified in paragraph 4, or if not possible, as soon as possible after the beginning of the anticipated event. The units remain activated for the entire period of the definite risk. The activation period can be shortened or prolonged depending on the calculation described in paragraphs 3.

7. Elia shall prepare, at least on annual basis, an overview with a list of events following the triggers specified in paragraph 3, as well as a short motivation on the use of one or more measures specified in paragraph 4.

8. At the latest 15 working days after the activation of units following the measure described in paragraph 4(b) or 4(c), ELIA shall submit a report containing a description and justification for this action to the CREG. The report shall at least contain:

   a. a description of the exceptional event;

   b. the result of the evaluations carried out in accordance with paragraph 3, including the values of the parameters mentioned and the timing of those evaluations;

c. the result of the evaluations carried out in accordance with paragraph 4, including the timing of the evaluations;

d. the energy activated per unit and per period specified by the time to restore frequency and the attained techno-economic efficiency in accordance with paragraph 5 and 6, including a justification for deviating from the techno-economic optimum, if applicable;

e. any actions Elia intends to take, or is taking, in order to verify or enforce the compliance of market parties with their contractual obligations towards Elia;

f. the lessons learned from the exceptional event and, if relevant, concrete recommendations that could ease the management of the following exceptional events.

Article 13. Escalation Procedures in accordance with Article 157(4) of the SOGL

1. As referred to Article 157(4) of the SOGL, ELIA ensures to have sufficient reserve capacity on FRR at any time in accordance with the FRR dimensioning rules. In cases of severe risk of insufficient reserve capacity on FRR in the LFC block, and only under exceptional circumstances, ELIA uses the escalation procedure.

2. The operational procedure specified in paragraph 1 can only be used if the FRR means required to cover the FRR needs following the dimensioning of FRR are not available.

3. Elia evaluates on a continuous basis for each period specified by the 15 minute balancing energy market time unit, the residual risk by subtracting (b) from (a), with :

    a. FRR needs as calculated in the FRR dimensioning (Title 3) and

    b. available balancing means which are calculated as the sum of :

        i. the procurement of balancing capacity within control area and exchange of balancing capacity with neighbouring TSOs, when applicable pursuant to article 32(1)a of the EBGL,

        ii. sharing of reserves, when applicable pursuant to Article 32(1)b of the EBGL,

        iii. the volume of balancing energy bids which are not contracted by Elia and which are expected to be available both within its control area and within the European platforms taking into account the available cross-zonal capacity pursuant to Article 32(1)c of the EBGL.

4. When during two or more consecutive periods specified by a 15 minute balancing energy market time unit, the residual risk, as calculated in paragraph 3, exceeds the Level 2 FRCE range, for these periods, Elia may :

    a. publish a balancing warning communication with the aim of :

        i. asking all BSPs to submit additional FRR non-contracted balancing energy bids;

ii. informing all BRPs such that they can adapt injections and off-take in their portfolio accordingly;

b. activate units which are available in line with requirements of the T&C Scheduling Agent, in line with Article 130 of the Code of Conduct, and that cannot be activated via the FRR processes;

c. activate units that do not provide MW schedules in the context of the Terms and Conditions Scheduling Agent, that cannot be activated via the FRR processes and that offer their available active power on a voluntary basis.

5. The measures specified in paragraphs 4(b) and 4(c) will be taken at the latest point in time for Elia to take action while taking into account the latest available information following the balancing warnings. Elia will strive towards techno-economic efficiency by taking into account the duration and magnitude of the residual risk and the maximum and minimum output, start-up time, start-up costs and other technical constraints if relevant.

6. The measures specified in paragraphs 4(b) and 4(c) are effectively activated taking into account the start-up time or activation time of the selected units in order to be available to provide additional capacity during the periods as specified in paragraph 3, or if not possible, as soon as possible after the beginning of this period. The unit remains activated, at least at minimum power, for the entire period of the forecasted event. The activation period can be shortened or prolonged following the updated evaluations as referred to in paragraph 3.

7. Elia shall prepare, at least on annual basis, an overview with a list of events following the triggers specified in paragraph 3, as well as a short motivation on the use of one or more measures specified in paragraph 4.

8. At the latest 15 working days after the activation of units following the measure described in paragraph 4(b) and 4(c), ELIA shall submit a report containing a description and justification for this action to the CREG. The report shall at least contain:

a. a description of the exceptional circumstances;

b. the result of the evaluations carried out in accordance with paragraph 3, including the values of the parameters mentioned and the timing of those evaluations;

c. the result of the evaluations carried out in accordance with paragraph 4, including the timing of the evaluations;

d. the energy activated per unit and per period specified by the 15 minute balancing energy market time unit and the attained techno-economic efficiency in accordance with paragraph 5, including a justification for deviating from the techno-economic optimum, if applicable;

9. BSPs are obliged to offer mFRR balancing capacity once Elia confirms the risk of an adequacy issue in Belgium and/or France. Such confirmation will be published by Elia after having received a communication on a “Critical Grid Situation” from the relevant Regional Coordination Center.

a. From D-3 (day D being the delivery date), and until the publication of the positive balancing capacity to be procured following Article 6(5) of the LFC Means,

   i. Elia will inform the market (via its Inside Information Platform, Elia Group IIP) about the bidding obligation as soon as reasonably possible after receiving the communication on the Critical Grid Situation.
   ii. Elia can update the information to apply the bidding obligation based on new information received from the relevant Regional Coordination Center.

b. The bidding obligation will be applied to all CCTUs of day D for which the Critical Grid Situation identifies an adequacy issue during at least one quarter hour.

c. In case a Critical Grid Situation is identified, Elia will provide all communications received from the Regional Coordination Center to the CREG as soon as reasonably possible.

10. When the bidding obligation is applied in line with the previous paragraph, BSPs are obliged to submit their mFRR capacity in the relevant auction organised by Elia at 10:00 D-1 of the CCTU(s) to which the bidding obligations applies and this:

    a. for all available positive mFRR balancing capacity available through coordinated generation units,
    b. for each individual BSP within the limits of the balancing capacity notified to the BSPs following Article 6(5) of the LFC Means.

Article 14. FRR availability requirements and on the control quality, defined in accordance with Article 158(2) of the SOGL

1. FRR providing units and FRR providing groups are required to be available at any time. Availability is monitored by Elia and subject to penalties as described in the terms and conditions for BSPs. A secondary market allows the transfer of FRR obligations in order to facilitate BSPs meeting their obligations.
2. The maximal aFRR full activation time of the Elia LFC block and the mFRR full activation time of the Elia LFC block are defined at respectively 5 and 12.5 minutes. Therefore, the aFRR full activation time of a LFC block and the mFRR full activation time of the LFC block shall not be more than the time to restore frequency.
3. The control quality criteria are specified in the terms and conditions for BSPs as availability (as described in paragraph 1), exclusivity (no activations are allowed for own use) and start-up requirements to ensure the full-activation time (as described in paragraph 2). FRR providing units and FRR providing groups shall demonstrate their compliance with control quality criteria by means of a prequalification process as described in the terms and conditions for BSPs.

Article 15. Roles and responsibilities for sharing of FRR in accordance with Article 166(7) and Article 175(2) of the SOGL

1. The roles and responsibilities for the control capability providing TSO, the control capability receiving TSO and the affected TSO are defined conform respectively Article 3(103), (104) and (94) of the SOGL.
2. The control capability receiving TSO is the TSO benefiting from the activation of the reserve capacity of the control capability providing TSO. He may request the activation of balancing energy from the control capability providing TSO by stating the requested volume of balancing energy, and timing of delivery. The control capability receiving TSO shall calculate the available cross zonal capacity before making such a request in order to ensure that the activation of balancing energy will not lead to power flows that violate the operational security limits. The control capability receiving TSO shall adapt the input of its LFC controller in order to take into account the activation of balancing energy by the control capability providing TSO.
3. The control capability receiving TSO takes into account reserve capacity which is accessible through a control capability providing TSO in its dimensioning of reserve capacity for FRR in accordance with the principles of Article 10.
4. Elia shall notify all TSOs of the same synchronous area about its intention to exercise the right to implement sharing of reserves according to Article 150(1) of SOGL. Any TSO identified as affected TSO according to Art 150(2) of SOGL has the responsibility to declare this to Elia within 1 month after receipt of the aforementioned notification. Upon this declaration, the affected TSO shall have the rights specified in Article 150(3) of SOGL.
5. The control capability providing TSO shall trigger the activation of its reserve capacity for a control capability receiving TSO. Prior to the activation of balancing energy, the control capability providing TSO shall confirm to the control capability receiving TSO the availability or unavailability of its reserves and the necessary cross zonal capacity after an activation request. The control capability providing TSO is responsible for the proper delivery of balancing energy by its connected BSPs. He shall adapt the input to its LFC controller in order to take into account the activation of balancing energy activated for the control capability receiving TSO.
6. The remaining cross zonal capacity shall be adapted by Elia after each activation where Elia acts as control capability providing TSO or control capability receiving TSO pursuant paragraph 2 and 5 of this article.

TITLE 5 Final Provisions

Article 16. Language

1. The LFCBOA is published in English, Dutch and French. In case of discussion on interpretation of the methodologies presented in the LFCBOA, the French and Dutch version prevail over the English version.