
ELIA LFC Block Operational Agreement

Revision History

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ELIA's proposal for public consultation

Disclaimer

This document, provided by ELIA, is the draft for stakeholder consultation of the ELIA proposal for the ELIA LFC Block Operational Agreements in accordance with Article 119 of Commission Regulation (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation.

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”).

Whereas

1. This document is a proposal developed by ELIA System Operator (hereafter referred to as “ELIA”) regarding the methodologies and conditions included in the 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 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. By dimensioning the frequency restoration reserve (hereafter referred to as FRR) and defining the processes to fulfil the frequency restoration 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:
 - determining common interconnected system operational planning principles;
 - determining common load-frequency control processes and control structures;
 - ensuring the conditions for maintaining operational security throughout the Union;
 - ensuring the conditions for maintaining a frequency quality level of all synchronous areas throughout the Union;
 - promoting the coordination of system operation and operational planning;
 - ensuring and enhancing the transparency and reliability of information on transmission system operation;
 - contributing to the efficient operation and development of the electricity transmission system and electricity sector in the Union.
5. 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.
6. 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 by

application of Article 6(5) of the SOGL have to be submitted for approval to the relevant regulatory authorities. Since ELIA is the only TSO operating in its LFC block, ELIA submits those proposals for methodologies and conditions for approval to the relevant NRA, i.e. CREG.

7. ELIA has consulted the stakeholders on the draft proposal in accordance with Article 11 of the SOGL. This consultation has taken place from July 10, 2018 until August 21, 2018.
8. 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.

TITLE 1 General Provisions

Article 1. 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.

Article 2. 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;
 - l. 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;
 - m. 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;
 - n. 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;
 - o. 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;
 - p. coordination actions aiming to reduce the FRCE as defined in Article 152(14) of the SOGL;
 - q. 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., f., i., j., m., n. are without application for the ELIA LFC block :
- a. Elements under a., d., e., f., j. and m. are not applicable since 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 i. is not applicable as RR is currently not applied in the ELIA LFC block.
 - c. 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., g., k., l., o. and p. of Article 119 of the SOGL are specified in Title 4.

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

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

1. ELIA, the interconnector operators and the connecting national TSO of each HVDC interconnector shall enter into agreements to define ramping restrictions.
2. Equitable treatment shall be ensured by ELIA for all interconnectors linking the same two synchronous areas or for all interconnectors within the same synchronous area.
3. A summary of the ramping restrictions to be applied to HVDC interconnectors shall be published on ELIA's website at least one week before they are enforced, in accordance with the obligations in Article 8 of the SOGL.
4. ELIA, in order to prevent the LFC block entering into an emergency state, may restrict equitably the ramping rates of all interconnectors between the same two synchronous areas, in coordination with the affected national TSOs and affected interconnector operators according to the terms of the agreement referred to as in paragraph (1).
5. Within 30 days of the restriction of ramping rate pursuant to paragraph (4), ELIA shall prepare a report containing a detailed explanation of the rationale, implementation and impact of this action and submit it to the relevant regulatory authority in accordance with Article 37 of Directive 2009/72/EC and neighbouring TSOs, and make it available to the significantly affected system users.
6. 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 as specified in Article 137(4) of the SOGL.

Article 4. 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 5. 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. 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.

2. 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.
3. Supplementary to these processes, and only under exceptional circumstances, reserve providing units or reserve providing group(s) which cannot be activated via the FRR processes may be activated in function of ELIA's operational needs.
4. Within 30 days after the use of measures to reduce the FRCE in accordance with Article 152(16) of the SOGL, ELIA shall prepare a report containing a detailed explanation of the rationale, implementation and impact of this action and submit it to the relevant regulatory authority.

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

Article 6. Dimensioning rules for positive reserve capacity on FRR

1. ELIA dimensions the required positive reserve capacity on FRR on a yearly basis in accordance with the minimum criteria set out in Article 157(2) of the SOGL on the basis of a probabilistic methodology.
2. Based on this probabilistic methodology, the required positive reserve capacity on FRR is determined for the calendar year following the calculation and is determined as a fixed value for every quarter-hour of that period.
3. Pursuant Article 157(2.h) of the SOGL, the probabilistic methodology ensures that the required positive reserve capacity on FRR is sufficient to cover the positive LFC block imbalances for 99.0% of the time.
 - a) Pursuant to Article 157(2.a) of the SOGL, the positive LFC block imbalances are based on consecutive historical records comprising at least the historical LFC block imbalance values. The sampling of those historical records is determined at 15 minutes, and includes a full year period, ending not earlier than 6 months before the calculation date.
 - b) Pursuant to Article 157(2.b) of the SOGL, ELIA takes into account in the probability distribution of the LFC block imbalances, in order to ensure to respect the current FRCE parameters in Article 128 of the SOGL for the time period referred to in Article 157(2.a) of the SOGL, the expected LFC block imbalances following the incremental renewable capacity installed of offshore wind power, onshore wind power and solar photovoltaics power between the period for which the reserve capacity is sized, and the period represented by the historical values of the LFC block imbalances. These expected system imbalances, calculated based on the forecast errors of renewable generation, are added to the historical records of LFC block imbalances.
 - c) Pursuant to Article 157(2.b) of the SOGL, ELIA takes into account in the probability distribution of the LFC block imbalances, in order to ensure to respect the current FRCE parameters in Article 128 of the SOGL for the time period referred to in Article 157(2.a) of the SOGL, the expected forced outages of power plants or relevant interconnections by removing periods with forced outages from the historic records and convoluting the distribution of system imbalances,

including the expected system imbalances, with a distribution curve representing the forced outages (including relevant HVDC-interconnectors). This distribution follows a simulation of at least 500 years taking into account the outage probability, the outage duration and the installed capacity of the projected generation fleet, as well as relevant transmission elements, for the period for which the reserve capacity is sized.

4. Pursuant Article 157(2.e) of the SOGL, ELIA determines the required positive reserve capacity on FRR in order that it is not less than the positive dimensioning incident of the LFC block, as defined in Article 3 of the SOGL. The positive dimensioning incident is equal to the positive reference incident as defined in Article 3 which shall, pursuant to Article 157(2.d) of the SOGL be the largest positive imbalance that may result from an instantaneous change of active power of a single power generating module, single demand facility, or single HVDC interconnector or from a tripping of an AC line within the LFC block.
5. Pursuant Article 157(4) TSOs of a LFC block shall have sufficient positive reserve capacity on FRR at any time in accordance with the FRR dimensioning rules. This shall determine the provision of positive reserve capacity following Article 32(1) of the commission regulation (EU) 2017/2195 of 23 November 2017 establishing a guideline on electricity balancing.

Article 7. Dimensioning rules for negative reserve capacity on FRR

1. ELIA dimensions the negative 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 a probabilistic methodology.
2. Based on this probabilistic methodology, the required negative reserve capacity on FRR is determined for every period of four hours of the day following the calculation.
3. Pursuant Article 157(2.i) of the SOGL, the probabilistic methodology ensures that negative reserve capacity on FRR is sufficient to cover at least the negative LFC block imbalances for 99.0% of the time.
 - a) Pursuant Article 157(2.a) of the SOGL, the negative LFC block imbalances are based on consecutive historical records comprising at least the historical LFC block imbalance values. The sampling of the historical records covers 15 minutes, and includes at least a full year period, ending not before the last day of the second month before the month for which the reserve capacity is calculated.
 - b) Pursuant to Article 157(2.b) of the SOGL, ELIA takes into account in the probability distribution of the LFC block imbalances, in order to ensure to respect the current FRCE parameters in Article 128 of the SOGL for the time period referred to in Article 157(2.a) of the SOGL, the expected forced outages of power plants or relevant interconnections by removing periods with forced outages from the historic records and convoluting the distribution of system imbalances, including the expected system imbalances, with a distribution curve representing the forced outages (including relevant HVDC-interconnectors). This distribution follows a simulation of at least 500 years taking into account the outage probability, the outage duration and the installed capacity of the projected generation fleet, as well as relevant transmission elements, for the period for which the reserve capacity is sized.

- c) This distribution curve will be calculated on a daily basis taking into the predicted schedule of the relevant HVDC-interconnectors.
4. Pursuant Article 157(2.f) of the SOGL, ELIA determines the required negative reserve capacity on FRR in order that it is not less than the negative dimensioning incident of the LFC block, as defined in Article 3 of the SOGL. It is equal to the negative reference incident as defined in Article 3 which shall, pursuant to Article 157(2.d) of the SOGL be the largest negative imbalance that may result from an instantaneous change of active power of a single power generating module, single demand facility, or single HVDC interconnector or from a tripping of an AC line within the LFC block.
5. Pursuant Article 157(4) of the SOGL, TSOs of a LFC block shall have sufficient negative reserve capacity on FRR at any time in accordance with the FRR dimensioning rules. This shall determine the provision of negative reserve capacity following Article 32(1) of the commission regulation (EU) 2017/2195 of 23 November 2017 establishing a guideline on electricity balancing.

Article 8. Determination of the ratio of automatic FRR and manual mFRR

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 the Terms and Conditions for BSP, specified in Article 13.
 - b) The ratio aFRR and mFRR is determined by means of the probabilistic methodology described in Article 6 and Article 7.
2. The probabilistic methodology ensures that the required reserve capacity on aFRR is sufficient to cover the absolute LFC block imbalance variations for 79% of the time
 - a) The LFC block imbalance variations are determined as the difference in LFC block imbalance over two subsequent periods of 15 minutes.
 - b) The probability distribution of the LFC block imbalances is based on at least the same historical records of LFC Block imbalance values as specified in Article 6 (3.a). The sampling of the historical records covers 15 minutes, and includes a full year period, ending not earlier than 6 months before the calculation date. Periods with forced outages of power plants or relevant interconnections are removed from the historic records.
 - c) ELIA takes into account in the probability distribution of the LFC block imbalances, in order to ensure to respect the current FRCE parameters in article 128 of the SOGL for the time period referred to in Article 157(2.a) of the SOGL, the expected LFC block imbalances following the incremental renewable capacity installed of offshore wind power, onshore wind power and solar photovoltaics power between the period for which the reserve capacity is sized, and the period represented by the historical values of the LFC block imbalances. These expected system imbalances, calculated based on the forecast errors of renewable generation, are added to the historical records of LFC block. The required positive and negative (symmetric for both directions) reserve capacity on aFRR is determined for the

calendar year following the calculation and is determined as a fixed value for every hour of that period.

3. The required reserve capacity on aFRR is symmetric for the positive and negative direction. ELIA determines the required positive reserve capacity on mFRR as the difference between the required positive reserve capacity on FRR and aFRR.

Article 9. 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 an operational agreement facilitating the sharing of FRR 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 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;
 - b) the reduction of the positive reserve capacity shall not exceed 30 % of the size of the positive dimensioning incident.
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 an operational agreement facilitating the sharing of FRR 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: 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% of the time based on the historical records referred to in Article 157(2.a) of the SOGL.
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. ELIA also take into account the restrictions defined in the agreements for the sharing due to possible violations of operational security and the FRR availability requirements 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 14.

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

Article 10. LFC BOA 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. ELIA will provide the relevant NRA with a trimestral report on FRCE quality, within two months after the end of the trimester.

Article 11. 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. The use of this procedure is subject to the same conditions as written in Article 5(3) and (4).

Article 12. 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.
2. In cases of severe risk of insufficient reserve capacity on FRR in the LFC block, and only under exceptional circumstances, ELIA may resort to modifying the production schedules according to existing procedures.
3. Within 30 days after the use of measures to reduce the FRCE in accordance with Article 152(16) of the SOGL, ELIA shall prepare a report containing a detailed explanation of the rationale, implementation and impact of this action and submit it to the relevant regulatory authority.

Article 13. 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. In addition, ELIA has implemented a secondary market to allow 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 7.5 and 15 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. 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 BSP.

Article 14. 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 and for the control capability receiving TSO shall be defined conform Article 3(103), respectively (104) of the SOGL. They are specified in an operational agreement between ELIA and the TSO of another LFC block which facilitates the sharing of FRR.
2. The control capability receiving TSO is the TSO benefiting from the activation of the reserve capacity of the control capability providing TSO. The control capability receiving TSO may calculate its own reserve capacity by taking into account reserve capacity which is accessible through a control capability providing TSO in accordance with the principles of Article 9 and the conditions set out in the operational agreement referred to in paragraph 1 of this article.
3. The control capability providing TSO shall trigger the activation of its reserve capacity for a control capability receiving TSO in accordance with the conditions set out in the operational agreement referred to in paragraph 1 of this article.

TITLE 5 : Final Provisions

Article 15. Timescale for implementation

1. The LFCBOA will enter into force 3 months after its approval by the National Regulatory Authority, CREG (not earlier than 1 January 2019) in line with SOGL Article 119(2).

Article 16. Language

1. The LFC BOA 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.