
Explanatory document for the Nordic synchronous area proposal for limits for the exchange of FCR between the TSOs in accordance with Article 163(2) of the Commission Regulation (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation

1. Introduction

The Commission Regulation (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation (hereinafter “**SO Regulation**”) sets out rules on relevant subjects that should be coordinated between Transmission System Operators, as well as between TSOs and Distribution System Operators and with significant grid users, where applicable. The goal of SO Regulation is to ensure provision of an efficient functioning of the interconnected transmission systems to support all market activities. In order to deliver these objectives, a number of steps are required.

One of these steps is to determine the limits for the exchange of FCR between the TSOs. Pursuant to Article 118(1)(t) of the SO Regulation, all Transmission System Operators in the Nordic Synchronous Area shall jointly develop common proposals for, if applicable, [...], limits for the exchange of FCR between the TSOs in accordance with Article 163(2).

According to Article 6(3)(d)(vii) of the SO Regulation the proposal for limits for the exchange of FCR between the TSOs in accordance with Article 163(2) (hereafter referred to as “**Proposal**”) shall be submitted for approval by the relevant national regulatory authorities (hereinafter “NRAs”) no later than 14 September, 2018. The Proposal is submitted for regulatory approval to all NRAs in the Nordic synchronous area. According to Article 6(6) of the SO Regulation the Proposal needs to be submitted to ACER as well, who may issue an opinion on the Proposal if requested by the NRAs.

This document contains an explanation of the Proposal from all TSOs of the Nordic synchronous area (hereinafter “**TSOs**”). It is structured as follows. The legal requirements for the Proposal and the interpretation of the scope are presented in Chapter 2. Chapter 3 describes the objective of the limits for the exchange of FCR. Chapter 4 provides an overview of the existing situation. The proposed limits for the exchange of FCR are described in Chapter 5. Chapter 6 describes the expected impact on the relevant objectives of the SO Regulation. Finally, Chapter 7 provides the timeline for implementation and Chapter 8 describes the public consultation.

2. Legal requirements and interpretation

2.1 Legal references and requirements

Several articles in the SO Regulation set out requirements which the Proposal must take into account. These are cited below.

- (1) Article 118(1)(t) and (2) of the SO Regulation constitutes the legal basis that the Proposal should take into account. Article 118 has the following content:

“1. By 12 months after entry into force of this Regulation, all TSOs of each synchronous area shall jointly develop common proposals for:[...]”

(t) if applicable, for synchronous areas other than CE, limits for the exchange of FCR between the TSOs in accordance with Article 163(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.”

- (2) Article 163(2) of the SO Regulation has the following content:

“ Article 163

Exchange of FCR within a synchronous area

[..].

2. All TSOs involved in the exchange of FCR within a synchronous area shall respect the limits and requirements for the exchange of FCR within the synchronous area specified in the Table of Annex VI.”

- (3) The table of Annex VI of the SO Regulation (as referred to in Article 163(2)) has the following content:

Table
Limits and requirements for the exchange of FCR

Synchronous area	Exchange of FCR allowed between:	Limits for the exchange of FCR
CE synchronous area	TSOs of adjacent LFC blocks	<ul style="list-style-type: none"> — the TSOs of an LFC block shall ensure that at least 30 % of their total combined initial FCR obligations, is physically provided inside their LFC block; and — the amount of reserve capacity on FCR, physically located in an LFC block as a result of the exchange of FCR with other LFC blocks, shall be limited to the maximum of: <ul style="list-style-type: none"> — 30 % of the total combined initial FCR obligations of the TSOs of the LFC block to which the reserve capacity on FCR is physically connected; and — 100 MW of reserve capacity on FCR.
	TSOs of the LFC areas of the same LFC block	<ul style="list-style-type: none"> — the TSOs of the LFC areas constituting a LFC block shall have the right to specify in the LFC block operational agreement internal limits for the exchange of FCR between the LFC areas of the same LFC block in order to: <ul style="list-style-type: none"> — avoid internal congestions in case of the activation of FCR; — ensure an even distribution of reserve capacity on FCR for the case of network splitting; and — avoid that the stability of the FCP or the operational security is affected.
Other synchronous areas	TSOs of the synchronous area	<ul style="list-style-type: none"> — The TSOs of the synchronous area shall have the right to specify in the synchronous area operational agreement limits for the exchange of FCR in order to: <ul style="list-style-type: none"> — avoid internal congestions in case of the activation of FCR; — ensure an even distribution of FCR in case of network splitting; and — avoid that the stability of the FCP or the operational security is affected.

- (4) Article 39(4) of Regulation (EU) 2017/2195 (hereafter: “**EB Regulation**”) includes a relevant restriction to the exchange of FCR: “*Cross-zonal capacity allocated for the exchange of balancing capacity or sharing of reserves shall be used exclusively for frequency restoration reserves with manual activation, for frequency restoration reserves with automatic activation and for replacement reserves. The reliability margin calculated pursuant to Regulation (EU) 2015/1222 shall be used for operating and exchanging frequency containment reserves, except on Direct Current (‘DC’) interconnectors for which cross-zonal capacity for operating and*

exchanging frequency containment reserves may also be allocated in accordance with paragraph 1.”.

(5) Article 6(3)(d)(vii) of the SO Regulation states:

“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: [...]

(d) methodologies, conditions and values included in the synchronous area operational agreements in Article 118 concerning: [...]

(vii) for synchronous areas other than CE and if applicable, the limits for the exchange of FCR between TSOs in accordance with Article 163(2);

2.2 Interpretation and scope of the Proposal

The dimensioning rules for FCR in accordance with Article 153 of the SO Regulation result in the total required amount of FCR for a synchronous area. Article 153(2)(d) of the SO Regulation specifies how this required amount of FCR shall be initially distributed over the TSOs of the synchronous area. Article 163 sets out the rules for deviating from this initial distribution by exchanging FCR between the TSOs within a synchronous area. Within this context, Article 163(2) and the table of Annex VI of the SO Regulation provide the TSOs with the right to specify the limits for the exchange of FCR which is the scope of this Proposal.

Article 39(4) of the EB Regulation includes the condition that only the reliability margin shall be used for exchanging frequency containment reserves between the TSOs of one synchronous area.

Where Article 163(2) only describes one type of FCR, the Nordic Frequency Containment Process (FCP) applies two types of FCR: FCR for normal operation (FCR-N) is used for continuous imbalances to keep the frequency within the ± 100 mHz range. The purpose of Frequency Containment Reserves for Disturbance situations (FCR-D) is to mitigate the impact of incidental disturbances. This Proposal addresses both types of FCR.

3. Objective of limits for the exchange of FCR

FCR exchange contributes to the efficient operation of the electricity system by allocating FCR more efficiently. However, for maintaining operational security, it is required to maintain a certain distribution of FCR in the Nordic synchronous area. The objective of the limits for the exchange of FCR is to guarantee that the FCR distribution after exchange will be operationally secure.

4. The existing situation

This chapter describes the existing limits for the exchange of FCR. Since the Nordic TSOs define two types of FCR, section 4.1 addresses FCR-N and section 4.2 addresses FCR-D.

4.1 Frequency Containment Reserves for Normal operation (FCR-N)

The existing Nordic System Operation Agreement requires that ‘Each subsystem shall have at least 2/3 of the frequency controlled normal operation reserve¹ in its own system for potential splitting up and island operation.’. In practice the TSOs consider this rule mainly relevant for limiting congestion caused by activation of FCR-N.

¹ The existing System Operation Agreement refers to FCR-N as ‘frequency controlled normal operation reserve’.

4.2 Frequency Containment Reserves for Disturbance situations (FCR-D)

The existing Nordic System Operation Agreement requires that ‘The activation of the frequency controlled disturbance reserve² shall not result in other problems in the power system. When the transmission capacity is being determined, the location of the frequency controlled disturbance reserve shall be taken into account. Each subsystem shall have at least 2/3 of the frequency controlled disturbance reserve in its own system for potential splitting up and island operation.’ The 2/3 rule is in practice mainly relevant for avoiding that operational security is affected.

5. Proposal for limits for the exchange of FCR

Article 163(2) and the table of Annex VI of the SO Regulation provide the TSOs with the right to specify in the synchronous area operational agreement the limits for the exchange of FCR in order to:

- avoid internal congestions in case of the activation of FCR;
- ensure an even distribution of FCR in case of network splitting; and
- avoid that the stability of the FCP or the operational security is affected.

The TSOs make use of the right to specify limits for the exchange of FCR-N in order to avoid internal congestions in case of the activation of FCR-N. For FCR-D, the TSOs make use of this right in order to avoid that operational security is affected. Below the impact on exchanging FCR is discussed.

FCR activation is triggered by frequency deviations which are caused by the net imbalance in the synchronous area. Both imbalances and FCR activation are distributed over the synchronous area and consequently result in additional flows in the transmission network, superimposed on the scheduled flows and flows resulting from the Frequency Restoration Process.

Article 39(4) of the EB Regulation requires that exchange of FCR must be within the reliability margin. With the intention to maximise the allowed exchange of energy to the day ahead and intraday markets, the reliability margins (TRMs) in the Nordic synchronous are generally kept very small which in some cases may lead to non-optimal operational procedures, e.g. for congestion management. The implications are that redistribution of FCR (due to e.g. FCR exchange) must be carefully considered to reduce the risk for overload in the grid caused by FCR activations. The reliability margins will to a large extent be used by activations of FCR-N.

The Nordic TSOs have estimated the additional flows that are supposed to use TRM³. From their studies, the TSOs concluded that the impact of the use of the TRM on interconnectors between the TSOs’ control areas is limited if at least 2/3 of the FCR-N is located in the TSO’s control area. For this reason, the TSOs propose that each TSO shall have at least 2/3 of their initial FCR-N obligation in its own control area. Increased flows due to FCR-D activations are however allowed beyond the use of the reliability margin for a limited period. Furthermore, since the SO Regulation specifies different products for upward FCR-D and downward FCR-D on most borders sufficient cross zonal capacity will be available to exchange at least one of these products, dependent on the direction of the scheduled flow on the border. Hence, the TSOs will allow exchanging upward and downward FCR-D outside the reliability margin for a limited period, but only if FCR-D exchange shall not cause the situation that the activation of the FCR-D may affect operational security. Based on their experience with the existing rules, the TSOs consider that this condition shall be fulfilled if each TSO shall have at least 2/3 of their initial FCR-D obligation in its own control area.

² The existing System Operation Agreement refers to FCR-D as ‘frequency controlled disturbance reserve’.

³ The input to the estimations were historical figures from 2016 (imbalances, FCR distributions etc.) and have therefore been compared to the TRM (Transmission Reliability Margin) and not yet with the reliability margin as used in the Electricity Balancing Guideline.

In case the TSOs decide to exchange or share FCR with one or more TSOs of other one or more synchronous areas (in accordance with Article 173 and 174 of the SO Regulation), the FCR provided by the TSO in the other synchronous area may be considered as delivered in the importing TSO's 'own control area'. The related rules will be set in the methodologies for frequency coupling, exchange and sharing of FCR (in accordance with Article 172 of the SO Regulation).

Because of the small initial obligation of East Denmark (approx. 3% of the Nordic FCR capacity), shifting the entire initial FCR-N obligation of East Denmark to other Nordic countries will only have a very small impact on the use of TRM on East Denmark's interconnector with Sweden. Consequently, the TSOs propose that the requirement that at least 2/3 of their initial FCR obligation shall be in the TSO's own control area shall not apply to East Denmark.

5.1 Summary

The arguments above result in the limits for the exchange of FCR as included in Article 3 and Article 4 of the Proposal:

Article 3 – Limits for the exchange of FCR-N

1. Each TSO shall have at least 2/3 of their initial FCR-N obligation (determined in accordance with Article 153(2)(d) of the SO Regulation) in its own control area;
2. The 2/3 obligation in paragraph 1 can be partly fulfilled by guaranteed FCR-N provision from another synchronous area;
3. In case of FCR-N capacity shortage in certain areas, affected TSOs may agree on a temporary exception to paragraph 1 and 2;
4. Because of the small initial FCR-N obligation of East Denmark, paragraph 1 shall not apply to East Denmark.

Article 4 – Limits for the exchange of FCR-D

1. Each TSO shall have at least 2/3 of their initial FCR-D obligation (determined in accordance with Article 153 of the SO Regulation) in its own control area;
2. The 2/3 obligation in paragraph 1 can be partly fulfilled by guaranteed FCR-D provision from another synchronous area;
3. In case of FCR_D capacity shortage in certain areas, affected TSOs may agree on a temporary exception to paragraph 1 and 2;
4. Because of the small initial FCR-D obligation of East Denmark, paragraph 1 shall not apply to East Denmark.

6. Expected impact of the Proposal on the relevant objectives of the SO Regulation

The Proposal generally contributes to and does not in any way hamper the achievement of the objectives of Article 4 of the SO Regulation. In particular, the Proposal serves the objectives to:

- Article 4(1)(d) ensuring the conditions for maintaining operational security throughout the Union; and
- Article 4(1)(h) contributing to the efficient operation and development of the electricity transmission system and electricity sector in the Union.

Where the objective of maintaining operational security (article 4(1)(d) may require stricter limits, operational efficiency may increase with limits that are less strict. The proposed limits for the exchange of FCR balance the objectives of ensuring the conditions for maintaining operational security and efficient operation of the electricity system.

7. Timescale for the implementation

The proposed limits for the exchange of FCR are similar to the rules that are currently applied in the Nordic synchronous area. Therefore, the TSOs shall implement the Proposal not later than when Nordic synchronous area operational agreement enters into force in accordance with Article 118 of the SO Regulation.

8. Public consultation

Article 11 of the SO Regulation states that: *“TSOs responsible for submitting proposals for terms and conditions or methodologies or their amendments in accordance with this Regulation shall consult stakeholders, including the relevant authorities of each Member State, on the draft proposals for terms and conditions or methodologies listed in Article 6(2) and (3). The consultation shall last for a period of not less than one month.”*

This proposal will be consulted in the period 1 June to 1 July 2018.