

Nordic System Operation Agreement (SOA) – Annex Load-Frequency Control & Reserves (LFCR)

Appendix 2A:

Assessment of arrangements for exchange and sharing of FRR
capacity between Finland and Estonia

FINGRID

ENERGINET

 **SVENSKA
KRAFTNÄT**

Statnett

**kraftnät
åland**

Approval date	Entry into force	Revision
12/05/2020	12/05/2020	Initial version

Table of contents

1	Introduction	2
2	Assessment	3

1 Introduction

This document is an appendix to the LFCR Annex to the Nordic System Operation Agreement (hereafter referred to as "Nordic SOA"). This appendix includes the assessment of arrangements for *exchange and sharing of FRR capacity between Finland and Estonia on HVDC interconnectors EstLink 1 and EstLink 2*. The assessment in chapter 2 of this appendix has been approved by RGN on 12 May 2020.

2 Assessment

Regional Group Nordic

Assessment of arrangements for exchange and sharing of FRR capacity between synchronous systems.

Arrangement for exchange/sharing between Finland and Estonia on Estlink 1 and 2 interconnections

Date: 22nd April 2020

Responsible for assessment: Reima Päivinen

Content

General

1. Basic information and a short description of the exchange/sharing arrangement of capacity

Exchange

2. Evaluation of how the arrangement comply with the approved Nordic methodology for exchange.

Sharing

3. Evaluation of how the arrangement comply with the approved Nordic methodology for sharing.

General

1. Basic information and a short description of the exchange/sharing arrangement

<p>Exchange</p> <p style="text-align: center;">X</p>	<p>Sharing</p> <p style="text-align: center;">X</p>	<p>Volume MW</p> <p>mFRR exchange – no limits</p> <p>mFRR sharing 140 MW</p> <p>aFRR exchange 35 MW</p>
<p>Nominal size of interconnector</p> <p>Estlink 1, 350 MW</p> <p>EstLink 2, 650 MW</p>	<p>Specific conditions regarding flow control</p> <p>Estlink 1, TTC 0-350 MW</p> <p>EstLink 2, TTC 30-650 MW</p>	
<p>Describe the conditions agreed for capacity exchange/sharing</p> <p>Following sharing/exchange arrangements apply on interconnections between Fingrid and Elering:</p> <ul style="list-style-type: none"> • sharing and exchange of mFRR • exchange of aFRR <p>Exchange/sharing of mFRR capacity can be done on a request from both parties. Minimum sharing period is 1 hour and the maximum period one month.</p> <p>Sharing is only applied in case Fingrid is procuring mFRR capacity from Estonia as the shared capacity will be reserved for both Elering and Fingrid. In case of fault on Estlink 1 and 2, voluntary bids in the Nordic balancing market will be used. Svk is informed when the sharing arrangement is applied.</p> <p>Exchange of aFRR is possible only on a request from Fingrid. Exchange is possible on Estlink 1 when there is more than 100 MW free capacity after day-ahead market results. Counter trading might be needed in case intra-day uses all free capacity on Estlink 1. aFRR bids from Estonian providers will be delivered to aFRR market platform for daily auction. Exchange of aFRR capacity is based on market results of aFRR capacity procurement.</p>		
<p>Describe the operational procedures for energy activation including information exchange</p> <p>Activation of shared and exchanged mFRR capacity is only possible within available capacity of the interconnections after confirmed day-ahead and intra-day trades and provided that the operational situation in Finland and Estonia enables it. The maximum duration for activation is normally expected to last up to 4 hours, but during exceptional disturbance cases in the power system, it may be longer.</p> <p>In case of need in Estonia, the bids are activated from the Finnish balancing/capacity market and can deviate from price order if needed. Bids are only activated if Fingrid's requirement for mFRR in real time to cover the reference incident, is fulfilled.</p> <p>In case of need in Finland, the capacity purchased in Estonia will be activated on a request from Fingrid.</p>		

The activation requests for mFRR are done by phone. The TSO in duty of the operation of the interconnections shall adjust the power flow. Activation shall be effected within 15 minutes by changing the power flow of the interconnections accordingly. Svk is informed about the activation.

Activation of aFRR in Estonia is based on control request sent to Elering by Fingrid. aFRR control request is calculated by Fingrid. The TSO that has control of Estlink 1 at the moment of aFRR exchange, shall change the confirmed power flow on Estlink 1 according to the control request. Activation shall be carried out in its entirety within 5 minutes of the activation signal being sent by changing the power flow of the interconnections automatically.

Exchange

2. Evaluation of how the arrangement complies with article 176 in SOGL for exchange

Nordic synchronous area approved methodology to determine limits on the amount of exchange of FRR/RR between synchronous areas defined in accordance with Article 176(1)/178(1) and the methodology to determine limits on the amount of sharing of FRR/RR between synchronous areas defined in accordance with Article 177(1)/179(1)

Article 3 – Limits for exchange of aFRR and mFRR

Article 3.1 The Nordic TSO involved in exchange of FRR is responsible for complying with article 176 of the SO Regulation;

Article 3.2, The TSO who intends to exercise the right to implement an exchange of FRR with a TSO in another synchronous area shall make an assessment against article 176 and the criteria below. The TSO shall:

- a. secure that dimensioning requirements in the Nordic LFC block are satisfied
 - i. In case of export of FRR capacity from a TSO to another TSO outside of the LFC block, equivalent FRR capacity equal to the export contract must be secured by the Nordic TSO in addition to the Nordic LFC block dimensioning volume requirement;
 - ii. In case of import of FRR capacity to a Nordic TSO from another TSO outside of the LFC block; procured volume may be counted for in the Nordic LFC block compliance monitoring for reserve availability as long as b) and c) below is fulfilled.
- b. secure that the needed availability of grid capacity between source and sink has a probability of at least 99%;
- c. secure that the needed availability of FRR from the reserve instructing TSO in the other synchronous area has a probability of at least 99%.

Article 3.3 The assessment of FRR exchange arrangements with other synchronous areas shall be approved by all Nordic TSOs based on a proposal of the exchanging TSO, which shall not be unreasonably withheld or delayed.

An assessment according to SOGL article 176 (1) of the operational impact between the synchronous systems, impact on the stability of the FRP of the synchronous area, impact on the ability of TSOs of the synchronous area to comply with the frequency quality target parameters defined in accordance with Article 127 and the FRCE target parameters defined in accordance with Article 128 and impact on the operational security.

The HVDC interconnections can be operated according to the product specification in the Nordic synchronous system, and hence, it is not supposed to have any impact on overall stability, operational security and frequency quality in the Nordic LFC block.

An assessment according to article 3.2 (a) above against dimensioning requirements in the Nordic LFC block.

Activation of mFRR capacity is only carried out if Fingrid's requirement for mFRR to cover the reference incident, is fulfilled. Hence, it has no impact on the dimensioning requirements for mFRR in the Nordic LFC block.

Activation of aFRR requires available aFRR capacity from Estonia and hence, it has no impact on the dimensioning requirements for aFRR in the Nordic LFC block.

An assessment according to article 3.2 (b) above against requirements for availability of grid capacity.

As the exchange agreement of aFRR/mFRR only is possible within available capacity of the interconnections after confirmed day-ahead and/or intra-day trades, it is not supposed to have any impact on availability of grid capacity. Counter trade shall be used if needed.

An assessment according to article 3.2 (c) above against requirements for availability of FRR from the reserve instructing TSO

The exchange of the reserve takes place within the EU territory, which is obliged under the SO GL to ensure that the FRR obligation is fulfilled 99% of the time. Based on this it can also be assumed that the reserve is available with a probability of at least 99%.

Sharing

3. Evaluation of how the arrangement complies with article 177 in SOGL for sharing

Nordic synchronous area approved methodology to determine limits on the amount of exchange of FRR/RR between synchronous areas defined in accordance with Article 176(1)/178(1) and the methodology to determine limits on the amount of sharing of FRR/RR between synchronous areas defined in accordance with Article 177(1)/179(1)

Article 4 – Limits for sharing of aFRR and mFRR

1. The Nordic TSO involved in sharing of FRR is responsible for complying with Article 177 of the SO Regulation;
2. The TSO who intends to exercise the right to implement sharing of FRR with a TSO in another synchronous area shall make an assessment against article 177 and the criteria below. The TSO shall:
 - a. secure that dimensioning requirements in the Nordic LFC block are satisfied
 - i. Disturbances leading to activations of the shared reserves, shall be reported for common Nordic evaluations of Nordic consequences
 - ii. The shared volume may be counted for in the LFC block compliance monitoring for reserve availability as long as b), c), d) and e) below is fulfilled
 - b. secure that the needed availability of grid capacity between source and sink has a probability of at least 99%;
 - c. secure that the needed availability of FRR from the reserve instructing TSO in the other synchronous area has a probability of at least 99%;
 - d. secure that the reduction in positive FRR capacity for disturbances within the Nordic LFC block does not exceed 50% of the size of the positive reference incident in the relevant control area;
 - e. secure that the reduction in negative FRR capacity for disturbances within the Nordic LFC block does not exceed 50% of the size of the negative reference incident in the relevant control area.

An assessment against SOGL article 177(1) of the operational impact between the synchronous areas, the stability of the FRP of the synchronous area, the maximum reduction of FRR that can be taken into account in the FRR dimensioning in accordance with Article 157 as a result of the FRR sharing, the ability of the synchronous area to comply with the frequency quality target parameters defined in accordance with Article 127 and the FRCE target parameters defined in accordance with Article 128 and the operational security.

As the sharing agreement only is applied in rare situations e.g. in case of lack of mFRR capacity in Finland and when the operational situation enables it, it is not supposed to have any impact on overall stability, operational security and frequency quality in the Nordic LFC block.

An assessment according to article 4.2(a) above against dimensioning requirements in the Nordic LFC block.

Sharing of capacity is only carried out in case Fingrid is procuring mFRR capacity from Estonia as the shared capacity then will be reserved for both Elering and Fingrid. Hence, it has limited impact on the dimensioning requirements in the Nordic LFC block as shared volume is small and probability for simultaneous faults in Estonia and Finland is limited.

An assessment according to article 4.2(b) above against requirements for availability of grid capacity.

As the activation of shared mFRR capacity or exchanged aFRR/mFRR is only possible within available capacity of the interconnections after confirmed day-ahead and intra-day trades, it is not supposed to have any impact on availability of grid capacity. Counter trade shall be used if needed.

An assessment according to article 4.2(c) above for availability of FRR from the reserve instructing TSO

The sharing of the reserve takes place within the EU territory, which is obliged under the SO GL to ensure that the FRR obligation is fulfilled 99% of the time. Based on this it can also be assumed that the reserve is available with a probability of at least 99%.

An assessment according to 4.2(d) above for max reduction in positive FRR capacity for disturbances secured for the relevant control area

The sharing agreement does not allow that more than 50% of the Finnish mFRR requirement is shared. The maximum mFRR sharing volume is 140 MW and the reference incident 900 – 1100 MW.

An assessment according to 4.2(e) above for max reduction in negative FRR capacity for disturbances secured for the relevant control area

NA

Comments from NOD on assessment:

NOD has no specific remarks to this assessment. NOD considers that availability of mFRR and aFRR resources from Estonia and specifications for provision over Estlink 1 and Estlink 2 are similar to service provision from inside of the Nordic LFC block.

SOGL has a restriction for reduction of the positive and negative reserve capacity in the LFC block of less than 30%, but this is currently not a realistic concern in the Nordic LFC block. If this should change, the TSOs will have to agree about some arrangement for distribution of reserve reduction in case of sharing with other synchronous systems.

Any changes to the arrangements, described in this assessment, shall be presented to NOD in due time before implementation for common Nordic evaluation.

Copy of decisions in RGN meeting (from MoM):

RGN approved NOD proposal on the assessment of arrangements for exchange/sharing between Finland and Estonia on EstLink 1 and 2 interconnections.

Date of approval of assessments in RGN:

12th May 2020