European Network of
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# Change log

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# Technical Requirements for Frequency Containment Reserve Provision in the Nordic Synchronous Area

28 March 2025

## Introduction

This change log outlines updates to the *Technical Requirements for Frequency Containment Reserve Provision in the Nordic Synchronous Area* with each new release. The updates aim to improve the document and correct any errors. Only essential changes are recorded; minor adjustments, such as spelling corrections, are excluded. This change log provides readers with transparent insights into the development of these technical requirements.

# Changes for version 1.1, released at 28.3.2025

## Requirements 1-13

- **Requirement 1: Steady state response for combination of FCR-N + FCR-D.** FCR-N and FCR-D combination requirement is now referred to as Requirement 1b. The requirement is calculated for both ramps 7 and 8. FCR-D term is included in the denominator.
- **Requirement 4: Deactivation.** Requirement is softened. Previous threshold value for the requirement was $1.7|P_{ss,theo}|$. In the updated version it has been changed to $2.5|P_{ss,theo}|$.
- **Requirement 6: Re-activation Static FCR-D.** It is specified in the requirement that the 60 second waiting period of Static FCR-D deactivation is excluded from the grace period.
- **Requirement 7: Deactivation rate Static FCR-D.** The equation is corrected to match the description of the requirement.
- **Requirement 9: Frequency domain performance.** Equation is corrected; terms are absolute values.
- **Requirement 11: Linearity (non-continuous).** The equation is corrected to match the figures illustrating the requirement (Figures 13 and 16). The requirement is written separately for FCR-D up and down.

## Test sequences

- **FCR-D ramp test***:* Frequency deviation after ramp number 7 is changed from 0.2 to 0.3 Hz.
- **FCR-N Energy management test:** Steps 1 and 6 are held until NEM has been fully activated for 1 minute.

## Data (Chapter 6)

- Power baseline and State of Charge are included as mandatory test data signals.
- Signals for AEM (on/off), NEM (on/off), and activated NEM power are to be reported per each reserve product.
- Added Instantaneous active power injection of the station as a recommended signal during operation and testing for entities that have a co-dependent power output with other units at the same substation.
- Signals for AEM (on/off), NEM (on/off), and activated NEM power are recommended as real-time signals, in addition to being mandatory for data logging.
- [Date] is not required information in the test data file name.
- Sine test data logging guidelines are included in the document.

## Static FCR-D (Chapter 3.1.3)

- Static FCR-D is allowed to deactivate when the frequency has been in the normal frequency range or in the frequency range of the opposite FCR-D product for 60 seconds.
- Static FCR-D shall pause their deactivation if a frequency deviation occurs during deactivation if technically possible.

- Included illustration of the behaviour of Static FCR-D in Figure 7.

## Endurance and limited energy reservoirs, LER (Chapter 3.5)

- Clarified guidance on how the NEM disable limits should be set.
- Clarified equations for the AEM mode (Equations 18-26), including equations for each reserve product.
- Clarified figures for the energy management test sequences.

## Start and end of FCR provision during a frequency disturbance (Chapter 3.7)

- Included guidance on expected response when FCR-N or FCR-D provision changes during an ongoing frequency deviation (market time unit change).

## Provision from aggregated resources (Chapter 3.11)

- Terms “dynamic/static operation/prequalification” are changed to “flexible/constant operation/prequalification”.