

The prequalification process and technical requirements of Manual Frequency Restoration Reserves (mFRR) Service

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1 Introduction

This document describes:

- Prequalification process of Reserve Units that will be used to provide Manual Frequency Restoration Reserve (mFRR)
- Verification of compliance with the technical requirements concerning Reserve Units in accordance with articles 158 and 159 of the Guideline on System Operation, Commission Regulation (EU) 2017/1485.

2 Reserve Unit Prequalification

2.1 Prequalification process

Balancing Service Provider is responsible for carrying out the prequalification tests in accordance with paragraph 4 of this document and for delivering the required information in accordance with paragraph 2.2.

The process illustrated in Figure 1 is followed in the prequalification of a Reserve Unit.

1. The Balancing Service Provider will notify Transmission System Operator about the wish to prequalify a Reserve Unit at least 2 weeks before prequalification testing by providing one or more alternative testing times.
2. After notification, Transmission System Operator will review the testing plan and will assess the testing plan within the 2 weeks.
3. If testing plan is approved, the Balancing Service Provider can proceed with the Reserve Unit prequalification test. Transmission System Operator has the right to send its representative to the prequalification tests. Balancing Service Provider is responsible for the costs caused by the carrying out of the tests and Transmission System Operator only for its own personnel costs. Balancing Service Provider can cancel the pre-qualification test up to 1 hour before the test. If Balancing Service Provider has cancelled all agreed testing times, then the Balancing Service provider has to start the process again from step 1. If not agreed differently.
4. After prequalification test, Balancing Service Provider will share the test results with Transmission System Operator
5. Transmission System Operator will verify that all necessary documentation are provided within 8 weeks. However, both parties work as expedient as possible in good faith.
6. If additional data is needed Balancing Service Provider will be notified and will have 4 weeks to provide missing information.
7. Transmission System Operator will analyze the prequalification test data no later than 3 months. If all necessary documentation is provided and results fulfill the requirements, set in this document, the Reserve Unit is accepted and Transmission System Operator will inform Balancing Service Provider of the result of the prequalification process. If the requirements are not fulfilled, a correction request is sent to the Balancing Service Provider, who has to carry out the necessary corrections or the Reserve Unit is not accepted.

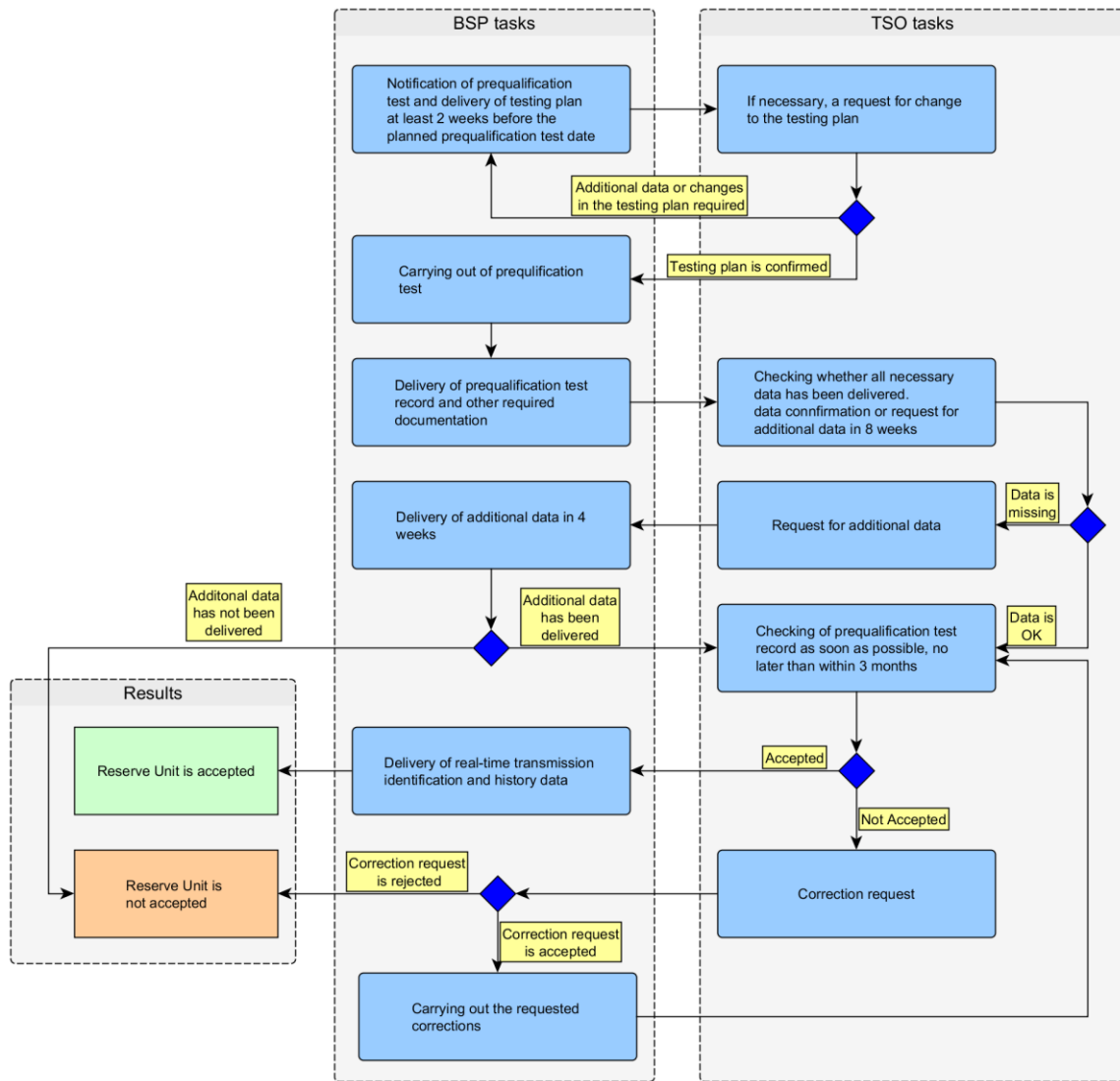


Figure 1. Prequalification process

2.2 Necessary documentation

In the notification to Transmission System Operator the Balancing Service Provider will provide:

1. maximum ΔP_{up} mFRR value to be tested ;
2. maximum ΔP_{down} mFRR value to be tested;
3. initial testing plan for the Reserve Unit or Resource;
4. information about control systems connection standard;
5. if applicable, additional clarifications and description of the working states in which Reserve Unit can provide the specified mFRR values.
6. EIC of the Reserve Unit
7. EIC of the Balancing Service Provider
8. Contact details of test responsible
9. Applicable only for Limited Energy Reservoir (hereinafter referred to as LER) mFRR units, comprehensive description of energy reservoir management (hereinafter referred to as ERM) of LER mFRR unit and technical details of the energy reservoir.

The Balancing Service Provider will document and deliver the results of the prequalification test to Transmission System Operator electronically according to the Transmission System Operator document "Technical principles and solutions for TSO electrical installations"¹.

Balancing Service Provider is responsible for providing following test records:

1. Time-stamped scheduled active power output;
2. Time-stamped instantaneous mFRR active power for:
 - a. Each mFRR providing unit,
 - b. Each mFRR providing group, and
 - c. each power generating module or demand unit of a mFRR providing group with a maximum active power output larger than or equal to 1,5 MW.
3. Time-stamped instantaneous total active power for:
 - a. Each mFRR providing unit,
 - b. Each mFRR providing group, and
 - c. each power generating module or demand unit of a mFRR providing group with a maximum active power output larger than or equal to 1,5 MW.

The data resolution must be equal or lower than 10s.

The requirements concerning the reporting and follow-up of the maintaining of the reserves have been described in Transmission System Operator document "Agreement for Manual Frequency Restoration Reserves Service".

In case of a Reserve Unit prequalification renewal, only the prequalification test record and any changed information needs to be delivered.

2.3 Validity period of prequalification test

The validity period of prequalification test is 5 years. A prequalification test shall be renewed before the ending of the validity period. A prequalification test shall also be renewed whenever changes influencing control capability are carried out on the Reserve Unit.

New prequalification is necessary to increase the maximum mFRR capacity (both Up and Down direction) of a Reserve Unit. Changes in composition of units participating in a Reserve

¹ [Kliendi tootmismooduli katsetamiste ja katsekava koostamise nõuded](#)

Unit do not automatically trigger new prequalification if the previous technical capability is maintained.

3 Technical requirements for the service provider

3.1 Activation signal process

The activation and deployment of the mFRR shall be based on the instructions received from TSO. The instructions consist of mFRR setpoint activation value for mFRR providing unit, which is communication from TSO to mFRR providing unit by web service.

mFRR activation preparation period must not be longer than 7 minutes, this means that mFRR activation must not start later than 7 minutes after activation request. A potential mFRR providing unit or group of units shall be able to modify its active power in accordance with the new setpoint within mFRR FAT. The FAT of mFRR shall be 12,5 minutes. The mFRR setpoint shall be kept for the duration of the activation requirements. The deactivation period for mFRR service cannot be longer than 10 minutes.

3.2 Data exchange

The potential mFRR provider shall provide to the reserve connecting TSO real-time data or periodically timestamped data on following data points.

1. mFRR capacity up (MW), that was sold to the mFRR market for current MTU
2. mFRR capacity down (MW), that was sold to the mFRR market for current MTU
3. Real-time power caused by the activation of mFRR. (The current activated amount of reserves)
4. State of charge level for LER mFRR providers.

TSO monitors the maintaining and activation of the reserve on the basis of the timestamped or real-time information. The activation request and measured activations shall be at least with accuracy 0,01 MW.

3.3 Activation speed

A Reserve Unit contributing to the maintaining of the Manual Frequency Restoration Reserve shall fully activate the reserve capacity in its entirety within 12,5 minutes from the sending of the activation request. The activation shall start no later than 7 minutes from the sending of the activation signal.

3.4 mFRR service accuracy

A potential mFRR providing unit or group of units shall be capable of controlling its active power to a set-point value with a steady-state error not greater than $\pm 10\%$ of the mFRR capacity or 0,1 MW, whichever is larger.

The resolution of the signal used by the mFRR providing unit to define the quantity of mFRR to be activated shall be at least 0,1 MW.

3.5 LER mFRR provider energy reservoir management requirements

Each LER mFRR provider shall provide a comprehensive description of the active ERM of the LER mFRR provision by providing information on the following points:

1. Full capacity of energy reservoir;
2. Operational limits that affect usage of reservoir;
3. Operable capacity of reservoir;

4. Permissible charge/discharge power;
5. Description of planned ERM strategy (energy source used for management);
6. Information on the rate of use of ERM (continuous, each 5 min, etc.);
7. Expected bid regularity and size.

4 Prequalification test

Balancing Service Provider shall make sure that a Reserve Unit that contributes to the maintaining of the Manual Frequency Restoration Reserve fulfils the requirements laid down in this document. The fulfilment of the requirements shall be verified by means of prequalification tests that shall be carried out in a normal operating situation of the Reserve Unit. The requirements and guidelines given in this document shall be followed in the execution of the prequalification tests.

Balancing Service Provider determines the maximum values to be tested for upward and downward balancing as ΔP_{up} and ΔP_{down} accordingly. Transmission System Operator sends activation signals according to the test sequence, provided in Table 1. Prequalification test sequence

Time (min)	Change in set value (% of ΔP)
-5	Start of the test (system and measuring are active)
0	Set value at 100% ΔP up
12,5	Hold value
17,5	Return to reference P
30	Set value at 100% ΔP down
42,5	Hold value
47,5	Return to reference P
57,5	End of the test

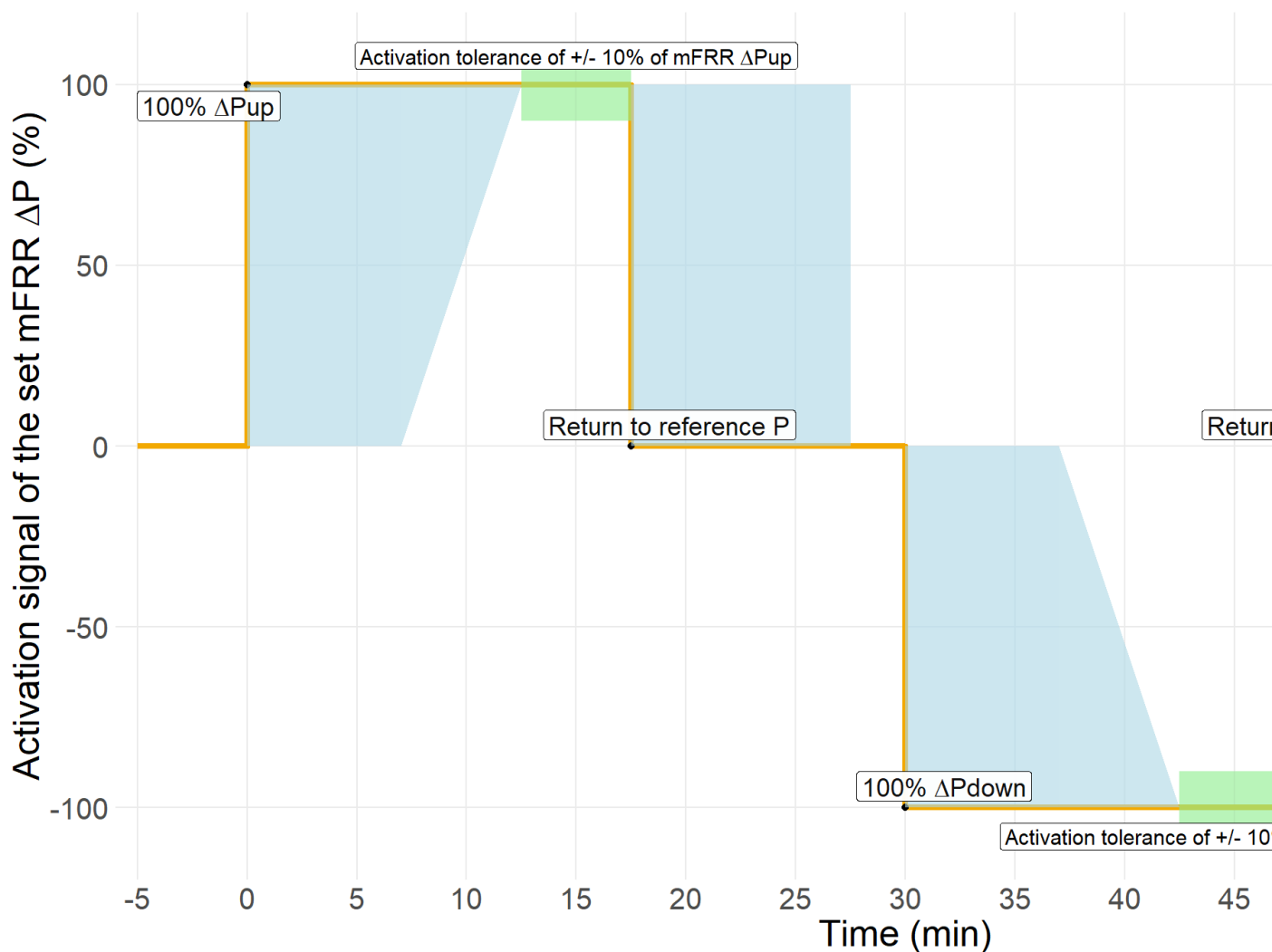


Figure 2. Prequalification test sequence, to the Balancing Service Provider. The sequence is used for testing the maximum upward (100% ΔP_{up}) and downward (100% ΔP_{down}) power change that the Reserve Unit should carry out. The test sequence is shown in **Error! Reference source not found..**

The Reserve Unit tested during the sequence shall fulfil the requirements described under paragraphs 3.1 and 3.2.

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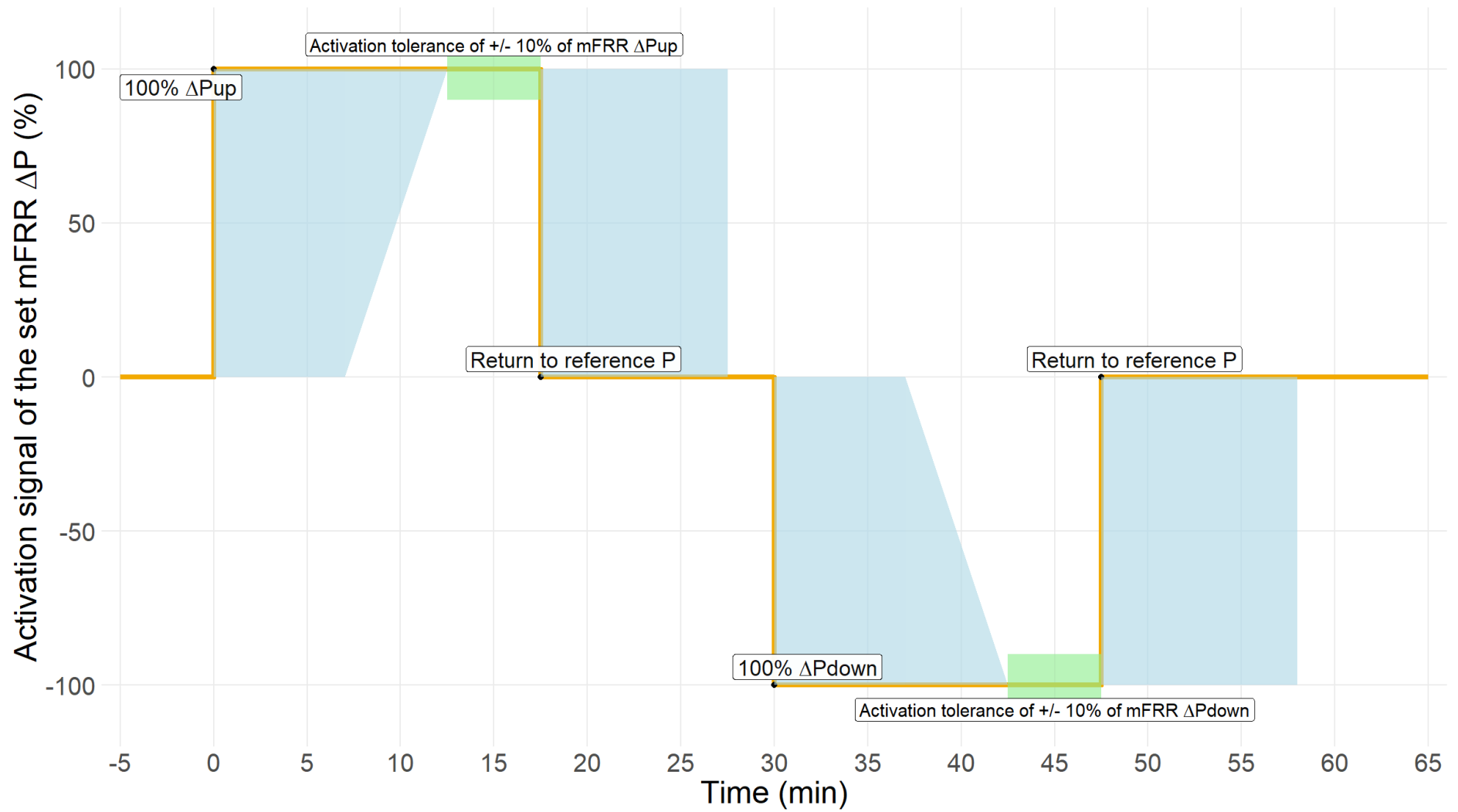


Figure 2. Prequalification test sequence