Implementation Guide

Settlement Basis for mFRR and mFRR-D Capacity Markets to BSP

Business process: Settlement
Version: 1.0
Status: Published
Date: 2025-09-18

Revision History

Version	Date	Changed by	Comments
1.0	2025-09-18	Erling Singstad Paulsen	First published version of the guide

Table of Content

1. Introduction

This implementation guide describes the interface between the BSP and TSO for reporting the settlement basis for the mFRR and mFRR-D capacity markets to BSP.

2. Message overview

The settlement basis for the mFRR and mFRR-D capacity markets will be sent from TSO to BSP every hour, covering the period from the start of the previous hour until the end of the following calendar day. Each message will be based on the available data at the time of the message production. Separate messages will be sent for each market, see Table 1. If a BSP does not have any submitted bids in the capacity market during the period covered, it will not receive any message. The messages will be distributed to BSP via ECP. Implementation guide for ECP can be requested from TSO.

Message name	Market	Frequency
Settlement Basis for mFRR Capacity Market to BSP	mFRR	Hourly
Settlement Basis for mFRR-D Capacity Market to BSP	mFRR-D	Hourly

Table 1 – Message details

The messages will be an implementation of *ReserveAllocationResult_MarketDocument* v6.5 and will include the following time series per resource object:

- Commitments in the mFRR or mFRR-D capacity market
- Correction due to deviation of volume between bids in the activation market and commitments in the capacity market according to current terms and conditions

Each time series will have a resolution of PT15M and will include the following data points:

- Volume of the commitment or deviation (MW)
- The unit price for the commitment or deviation (EUR)
- The committed amount or deviation amount for the commitment or deviation (EUR)

A deviation (MW) and deviation amount (EUR) can be both negative and positive to account for voluntary bids for each individual resource object.

2.1 BSP Data Aggregation

Data aggregated at the BSP level for a bidding zone and direction is not part of the message but can be calculated by BSP from the time series as described in this section. See also Section 2.3 Example Data.

The total deviation (MW) at the BSP level for a given MTU, bidding zone and direction is always less than or equal to zero and is given by:

$$Total\ Deviation\ [MW] = min(D_{\Sigma}, 0)\,,$$
$$D_{\Sigma} = \sum_{i=1}^{n} Deviation(i)$$

Where D_{Σ} is calculated as the sum of all deviations over all n time series for a given bidding zone and direction at a particular MTU.

Similarly, the overall settlement amount at the BSP level for a given MTU, bidding zone and direction is always less than or equal to the overall committed amount CA_{Σ} and is given by:

$$Settlement\ Amount\ [EUR] = min(CA_{\Sigma} + DA_{\Sigma}, CA_{\Sigma}),$$
$$CA_{\Sigma} = \sum_{i=1}^{n} Commited\ Amount(i)$$
$$DA_{\Sigma} = \sum_{i=1}^{n} Deviation\ Amount(i),$$

Where CA_{Σ} and DA_{Σ} are calculated as the sum of all committed amounts and deviation amounts over all n time series for a given bidding zone and direction at a particular MTU. See *financial_Price.amount* in Table 2 for definitions of committed amount and deviation amount.

See 2.3 Example Data for a detailed example.

2.2 Manual Overrides

If the data has been manually overridden by the TSO at the BSP level for a given MTU, bidding zone and direction, an additional time series without the field *registeredResource.mRID* will be added to the message. The overridden total commitment, deviation and committed/deviation amount at the BSP level for a given bidding zone and direction will be reported in this time series. The time series for the resource objects in the same bidding zone and direction will contain points with zero values at overridden MTUs, as illustrated by Figure 1. Reason code Z67 will be added to points at overridden MTUs for time series with the same bidding zone and direction.

If manual overrides are registered after the period for the scheduled message is passed, the message will be manually resent for a full day to the BSP concerned.

2.3 Example Data

BSP1								
Bidding Zone & Direction	**Time Series**	**Reason Code**	**Field**	**Unit**	**MTU**			
					MTU1	MTU2	MTU3	MTU4
NO1 UP	N/A Z67 Manual Override		Unit Price	EUR	1	2	2	1
		Z31	Commitment	MW		30		
			Committed Amount	EUR		60		
		ZA7	Deviation	MW		-30		
			Deviation Amount	EUR		-60		
	RO1		Unit Price	EUR	1	2	2	1
		Z31	Commitment	MW	10	0	10	0
			Committed Amount	EUR	10	0	20	0
		ZA7	Deviation	MW	-10	0	-10	5
			Deviation Amount	EUR	-20	0	-40	10
	RO2		Unit Price	EUR	1	2	2	1
		Z31	Commitment	MW	20	0	20	0
			Committed Amount	EUR	20	0	40	0
		ZA7	Deviation	MW	-20	0	-20	0
			Deviation Amount	EUR	-40	0	-80	0
	RO3		Unit Price	EUR	1	2	2	1
		Z31	Commitment	MW	0	0	0	50
			Committed Amount	EUR	0	0	0	50
		ZA7	Deviation	MW	50	0	50	-40
			Deviation Amount	EUR	100	0	200	-80
	To be calculated by BSP		ΣCommitment	MW	30	30	30	50
			ΣCommitted Amount	EUR	30	60	60	50
			ΣDeviation	MW	20	-30	20	-35
			Deviation Factor		2	1	2	2
			ΣDeviation Amount	EUR	40	-60	80	-70
			Total Deviation	MW	0	-30	0	-35
			Settlement Amount	EUR	30	0	60	-20

Figure 1 - Detailed example with calculations

The example shows four different time series for a particular BSP for bidding zone NO1 and direction UP. In MTU1 to MTU3 the BSP has commitments on RO1 and RO2 but has used voluntary bids on RO3 to meet and exceed the commitment. This results in a Total Deviation (MW) of 0 and a Settlement Amont (EUR) equal to the Committed Amount (MW). For MTU2 the Deviation (MW) and Deviation Factor has been manually overridden at the BSP level. In MTU4 the BSP has a commitment on RO3 which is only partially delivered on RO3. A voluntary bid on RO1 is also present, but the overall commitment is still not met. This results in a negative Total Deviation (MW) and a negative Settlement Amount (EUR) once the deviation factor is applied.

3. Document attributes and dependencies

Both messages listed in Table 1 will implement *ReserveAllocationResult_MarketDocument* v6.5 as detailed in Table 2. The field *process.processType* will be used to distinguish between the messages.

ReserveAllocationResult_MarketDocument		**iec62325-451-7-reserveallocationresult – version 6.5**
mRID	M	Unique identification of the document
revisionNumber	M	Version of the document
type	M	**A38** – Reserve allocation result document
process.processType	M	**A30** – Tertiary reserve process **Z16** – mFRR-D
sender_MarketParticipant.mRID	M	Identification of the party sending the document Statnett: **10X1001A1001A38Y**
		A01 – EIC coding scheme
sender_MarketParticipant.marketRole.type	M	**A04** – System Operator
receiver_MarketParticipant.mRID	M	Identification of the party receiving the document
		A10 – GS1 coding scheme
receiver_MarketParticipant.marketRole.type	M	**A46** – Balancing Service Provider
createdDateTime	M	Date and time of document creation (in ISO 8601 UTC format) YYYY-MM-DDTHH:MM:SSZ
reserveBid_Period.timeInterval	M	The period covered by the document (in ISO 8601 UTC format) Start: YYYY-MM-DDTHH:MMZ End: YYYY-MM-DDTHH:MMZ
domain.mRID	M	EIC identification of the Control Area Norway: **10YNO-0--------C**
		A01 – EIC coding scheme
TimeSeries – one or more instances		
mRID	M	Unique identification of the time series
businessType	M	**A10** – Tertiary control
acquiring_Domain.mRID	M	The EIC identification of the Nordic Market Area: **10Y1001A1001A91G**
		A01 – EIC coding scheme

connecting_Domain.mRID	M	The EIC identification of the bidding zone where the resource is located
		A01 – EIC coding scheme
quantity_Measurement_Unit.name	M	**MAW** - megawatt
currency_Unit.name	M	**EUR** - euro
energy_Measurement_Unit.name	M	**MWH** – megawatt hours
registeredResource.mRID	O	The unique identification of a resource. Will be omitted if the time series contains manually overridden data
flowDirection.direction	M	**A01** – Up **A01** – Down
curveType	M	**A03** – Variable sized block
Series_Period – One or more instances per TimeSeries		
timeInterval	M	The period covered by the time series (in ISO 8601 UTC format) Start: YYYY-MM-DDTHH:MMZ End: YYYY-MM-DDTHH:MMZ
resolution	M	**PT15M**
Point – One or more instances per Series_Period		
position	M	Position within the time interval. Sequential value beginning with 1
quantity	M	Quantity of commitment or deviation
price.amount	M	The unit price for the commitment or deviation
financial_Price.amount	M	The commited amount or deviation amount for the commitment or deviation. **Commited amount:** $\text{quantity} \times \text{price.amount}$ **Deviation amount:** $\text{quantity} \times \text{price.amount} \times \text{deviation factor}$
		Deviation factor – 0, 1, 2 or 25 Can be deduced from deviation amount as follows: $\frac{\text{financial\_Price.amount}}{\text{quantity} \times \text{price.amount}}$
Reason – Exactly one instance per TimeSeries		
code	M	Commitments: **Z31** – mFRR, Balancing Power **Z74** – Disturbance reserve Deviations:

		ZA7 – Correction, deviation between CM and EAM
Reason – Zero or one instance per Point		
code	M	**Z67** - Override

Table 2 – Document attributes

The followed reason codes are used in the messages:

Reason code	NMEG Name	NMEG Description
Z31	mFRR, Balancing Power	Frequency Restoration Reserve - Manual activated reserves (mFRR), Balancing Power
Z74	Disturbance reserve	A reserve to be used if disturbance occur. If the bids on the balancing power market are not sufficient to remedy the disturbance, the TSO can activate the disturbance reserve and brings the system into balance.
Z67	Override	The information in question is overridden or a result of an override of data
ZA7	Correction, deviation between CM and EAM	Correction due to deviation of volume between bids in the activation market and commitments in the capacity market according to current terms and conditions

Table 3 – Reason codes