Balancing Reserve

Provider Guidance v.1
February 2024

ESO

Version History

Version	Added Information	Date Published
V1		February 2024

Contents

Balancing Reserve (BR)

The information in this guidance is tailored to support Balancing Reserve (BR) providers. This document complements the service's contractual documents: the Service Terms, Procurement Rules and Balancing Services Glossary as were approved by Ofgem on 08 February 2024. In the event of any conflict or inconsistency between this document and the contractual documents, the latter shall prevail.

Balancing Reserve (BR) is the first of our new suite of Reserve products. The BR market will allow us to procure access to upwards flexibility (headroom) and downwards flexibility (footroom) through two new balancing services: Positive Balancing Reserve and Negative Balancing Reserve. This capacity can then be manually dispatched by ESO control engineers in real time.

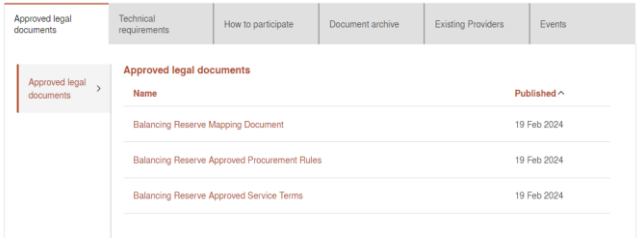
Please note this document does not include information about legacy reserve services, Short Term Operating Reserve (STOR) or Optional Fast Reserve which will ultimately be replaced by new reserve services and phased out. Information about STOR and Optional Fast Reserve can be found on the ESO website.

Balancing Reserve can be dispatched in both pre and post fault system operation scenarios. Contracted BR units can be dispatched to correct persistent energy imbalances such as when wind output is consistently above or below our forecasts. BR units could also be dispatched to replace energy from constrained generators or to help replace exhausted response or other reserve services following a fault on the network which has created a large energy imbalance.

We ran an Article 18 EBGL consultation for Balancing Reserve which concluded on 26 October 2023. After reviewing consultation responses and providing our own responses we submitted the consultation pack to Ofgem on 08 December 2023.

The documents include Service Terms, which describe the technical specification for the provision of Balancing Reserve, and Procurement Rules, which describe the eligibility rules for participation in the services and explain how the BR market will function.

This guidance is published to support the onboarding to the BR service by our providers. It is designed to give additional information on the rules and recommendations regarding the delivery of these services, along with relevant use cases. This document will be updated regularly.



BR Availability Payments

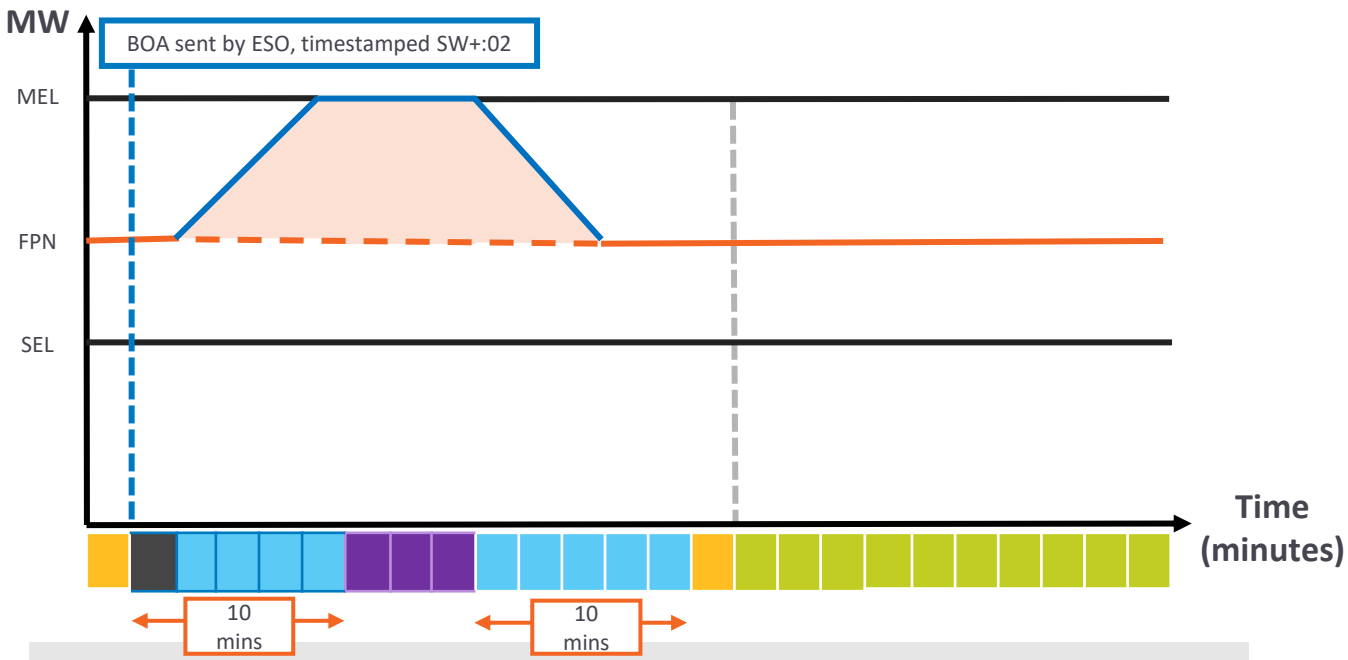
Availability Payments

- The day ahead BR auction is Pay-as-Clear.
- Forty-eight 30-minute service windows for both Positive Balancing Reserve and Negative Balancing Reserve.
- Market participants submit their availability prices and BR offered volumes before 08:15 Gate Closure time.
- The ESO submits a buy order which represents the willingness to pay for a given volume of firm BR volume.
- An auction is conducted by auction partners NSIDE using the same auction algorithm as for EAC but via an independent auction for Balancing Reserve run in the morning.
- A cohort of accepted sell orders and buy orders is determined to maximise market welfare.
- A clearing price is determined to maximise market welfare whilst minimising total cost of procurement.

All successful providers for each service window will be paid the clearing price for that service window.

Detailed information about the day ahead auction can be found in this market explainer document.
https://www.nationalgrideso.com/document/277671/download

BR Utilisation Payments



Utilisation Payments

- Utilisation of BR is through bids and offers in the BM.
- Holding a BR contract is not a guarantee of dispatch – in some periods reserve will not be required, the unit may not adequately meet the system need (e.g. we may not be able to dispatch units located behind constraints).
- Submitted dynamic parameters, MEL, SEL and FPN should reflect contract terms.

Payments for utilisation are made from ELEXON via the usual BOA settlements processes.

Detailed information about trading charges here
[Trading Charges - Elexon BSC]

Service Specification

ESO

Overview of the Technical Parameters

Design Element	Proposal
Direction	Positive Balancing Reserve (Upwards flexibility) and Negative Balancing Reserve (Downwards flexibility).
Minimum Contract Size	1 MW
Provider Eligibility	BM Units with a back up means of dispatch (control or system telephony) during contracted windows
Time to full delivery	10 minutes (including Notice to Offer (NTO) / Notice to Bid (NTB))
Energy Requirement	The unit must be able to deliver the full contracted capacity per Service Window
Operational Metering	As per Grid Code, 1Hz is the standard required for BM participation.
Dispatch mechanism	Bid Offer Acceptance (BOA) to contracted BM units.
Notice to start ramping (NTO/NTB)	As per Grid Code - 2 minutes. This parameter can be lower than 2 minutes
Ramp rates	Minimum ramp-up and ramp-down rate to be in line with Time to full delivery No maximum ramp rate
Baselining	Physical Notifications (PNs) submitted in line with Grid Code specifications.
Dispatch Flexibility	*Dispatch must not be limited by Stable Import Limit (SIL)/ Stable Export Limit (SEL), Minimum Non-Zero Time (MNZT) or Minimum Zero Time (MZT).* For units offering Positive BR from 0MW or through 0MW, SEL must be 0 or 1 (MW) and MNZT must be 0 or 1 (minute) – for units offering Positive BR from any FPN >0 this does not apply. For units offering Negative BR from 0MW or through 0MW, SIL must be 0 or -1 (MW) and MZT must be 0 or 1 (minute) - for units offering Positive BR from any FPN <0 this does not apply.

Service Stacking

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Splitting

Splitting

A unit has the opportunity (but not the obligation) to be accepted for different products in the same service window.

Note: The Balancing Reserve auction is not co-optimised with the Dynamic Response auction (EAC auction) and therefore providers may not offer Balancing Reserve and Dynamic Response products in the same Sell Order or Basket. Providers must monitor their units' contracts from the morning BR auction before submitting Sell Orders for the afternoon EAC auction.

Splitting

Splitting within response

- Splitting is allowed between all frequency response products (i.e., amongst any combination of DCL, DCH, DML, DMH, DRL, and DRH).

Splitting within reserve

- Splitting is allowed between Balancing Reserve product (PBR and NBR), between Quick Reserve product (PQR and NQR), and between Slow Reserve products (PSR and NSR).
- Splitting is not allowed between different reserve services.

Splitting between response and reserve

- Splitting is allowed between Balancing Reserve product and response product in the opposite direction (i.e., PBR and DCH/DMH/DRH, NBR and DCL/DML/DRL).

Allowed
Not allowed
Not applicable

Splitting Matrix			Response						Reserve					
			DC		DM		DR		BR		QR		SR	
			DCL	DCH	DML	DMH	DRL	DRH	PBR	NBR	PQR	NQR	PSR	NSR
Response	DC	DCL												
		DCH												
	DM	DML												
		DMH												
	DR	DRL												
		DRH												
Reserve	BR	PBR												
		NBR												
	QR	PQR												
		NQR												
	SR	PSR												
		NSR												

Joining the Services

High Level User Journey

Table 2: High level overview of the user journey and the relevant ESO Systems

Stage	Explore	Onboarding /Account Management	Participate	Contract Management	Schedule / Dispatch	Review	Payment
User Journey	Gather data and information Build business case Understand codes, markets and connections Understand Service Parameters	User, company, unit asset registration Pre-qualification Agent set up Contract Accession Asset / Unit versioning User Management	Tender Submission Action Submission Co-optimisation	Contracts awards and status Manage contracts	Availability management Instructions	Data submission / collection	Performance monitoring Settlement Penalties Disputes Financial position
ESO Systems	DEP ESO Website	SMP	EAC SMP	SMP Data Portal	OBP/BM	DEP SMP	Settlement System SMP

Acronyms: DEP – Digital Engagement Platform, EAC – Enduring Auction Capability, OBP – Open Balancing Programme, STAR – Settlement and Revenue (System)

First Time User Registration

If you and your organisation are new to NGESO and to the SMP Portal, then it is required that you register directy via the portal using the following instructions.

The User should visit and bookmark the following link: https://portal.nationalgrideso.com/smp/s/login/

As a first time user you will need to click the “Register New Account” button. Users will be navigated to the first ‘screen’ to capture Registration.

Registering New Primary User

In order to access the SMP Portal, it is expected that upon initial registration the main or ‘primary’ contact (user) at your organisation/company will undertake the registration steps.

Registration involves submitting one’s contact details and their organisation/company details. The successive order is contact details followed by company details.

When entering email addresses or telephone numbers, standardised formats are expected, if a User/Contact does not submit field values compatible with the expected format then the field will be flagged in a red border with a prompt instruction. For example if an email address has been submitted with the incorrect format.

Once all of the fields have been completed on the User/Contact section, the ‘‘Next’’ button will no longer be shaded grey, instead it will be converted into a blue ‘button’, allowing you to proceed to the next step.

Registering the Primary User’s Company

The ‘Register new Account’ stage involves two pathways depending on the Company Status. If the User/Contact’s organisation is a UK Limited Company, they select the first checkbox. If the User/Contact’s organisation is a non-UK Company then they select the second checkbox.

Once the option is selected, the user clicks on the ‘‘Next’’ Button.

Registering a UK Company

The User/Contact will be prompted to search for the Company Name and the Company Registration Number.

For Company Name - they will be expected to enter the name, which will trigger a lookup search/listing of similar names for the user to choose from.

For Company Registration Number - they will be expected to enter the exact reference number, which will trigger a lookup search/listing for the user to select and confirm.

Please note that only valid and accurate Registration Numbers will be accepted and appear in the search exercise.

For Company Registration Number - they will be expected to enter the exact reference number, which will trigger a lookup search/listing for the user to select and confirm.

Please note that only valid and accurate Registration Numbers will be accepted and appear in the search exercise. If your Company is a UK Limited Company and the search listing is unsuccessful, you will need to reach out to your NGESO Account Manager by email

Once a match has been found, the User/Contact must select the ‘‘Submit’’ button to proceed to the next step.

If the search result is incorrect or the User/Contact wishes to undertake a new search, then they are expected to click on the ‘‘Remove Company’’ link to refresh the search functionality.

Once the search result is correct, then the User/Contact selects the ‘‘Submit’’ button on the bottom right right-hand corner of the screen.

For more information on this process, or for information on registering a non UK company click here.

For technical support please contact: commercial.operation@nationalgrideso.com

Unit and Asset Registration

Once you have registered as a user on SMP, you can begin creating your units and assets you wish to prequalify for Balancing Reserve.

In order to do so, you should enter your SMP account via the following link:
https://portal.nationalgrideso.com/smp/s/login/

If you are a first time user, please follow the guidance on the prior slide to register yourself/your company.

If not, or you have already completed first time user registration, you can proceed to register your Units and Assets in SMP and pre-qualify them for Balancing Reserve (Positive and/or Negative).

For users who already have Assets and Units in SMP, for other services (i.e DC/DM/DR), that you wish to pre-qualify for Balancing Reserve, you can move ahead to **Pre-qualifying Units for Balancing Reserve.**

Registering New Assets and Units

You can register new Assets and Units on the SMP portal, by following the instructions in the demo video linked here: Creating Assets and Units in SMP

or by following the instructions in S**ection 4 and 5** of the SMP External User Guide

This process is the same as for any other services you have pre-qualified for in SMP; such as DC, DM or DR.

Prequalifying Units for Balancing Reserve

In order to prequalify your units for Positive or Negative Balancing Reserve, you should have created your Assets and Units, and linked them together (As per the prior video and section 6 of the User Guide). You can then proceed to pre-qualification, by following the instructions in the demo video linked here (ensure you have selected the relevant Balancing Reserve service): Prequalifying Units for Balancing Services

Or by following the instructions in **Section 7** of the SMP External User Guide

Once you have submitted your unit/s for pre-qualification, they will be reviewed by the ESO team. We will check that: a signed Form B has been provided, as well as that the Unit information is correct and meets the service parameters. If all of this is true, your unit will be approved and is ready to take part in Balancing Reserve.

For technical support, and SMP queries, please contact:
commercial.operation@nationalgrideso.com

Order Submission Process (EAC)

The following section will give a step by step guide to submitting orders on EAC. If you and your organisation are new to NGESO and have yet to register to SMP, then it is required that you register there first. All participants must then be registered as a user for EAC, even after registering units on SMP.

After registering for EAC and logging in with 2-factor authentication the first step is to select that auction that you would like to bid into. All auctions with gates open can be found under the 'Auctions' tab.

After you have selected the auction that you would like to bid into you will need to select the unit you would like to use from the drop down menu.

Following this you will start to build and add your baskets (defined by EFA block). You will give your basket a name and a family name if these are looped baskets and add in the relevant information such as price volume and any child order or substitutable child orders as required.

Once all of the relevant information has been added the bid can be submitted.

After the auction results can be found in the results tab for your relevant unit, all results will be published on the Data Portal for all units.

Please note that bids can also be submitted via API, to obtain API credentials please contact the ESO.

Figure 2: View of upcoming auctions

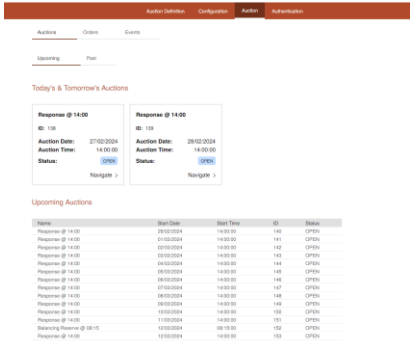


Figure 3: Button to create new basket

Figure 4: Adding parent and child orders to the basket

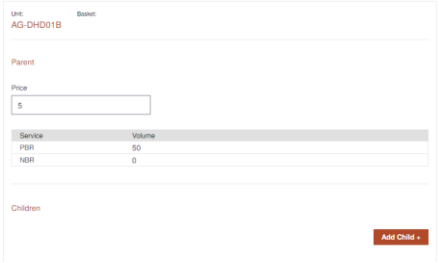
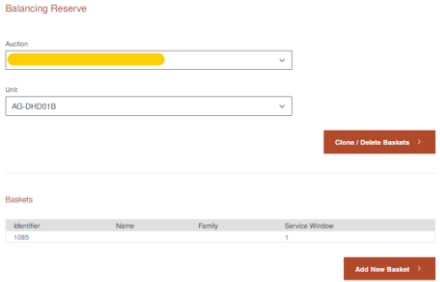


Figure 5: Adding parent and child orders to the basket (continued)



Performance Monitoring

ESO

Performance monitoring

This section provides information on the application of the performance monitoring methodology for the Balancing Reserve. The unit participating in the service will be subject to performance monitoring on the Time to Full Delivery, Availability, Dispatch Flexibility and Utilisation. In the event of any conflict or inconsistency between this document and the Service Terms, the latter shall prevail.

Performance Monitoring of Availability (EoD code "AVAIL")

A contracted unit should be able to demonstrate 100% of contracted Positive Balancing Reserve (headroom) or Negative Balancing Reserve (footroom). Failure to demonstrate the contracted availability will trigger an Event of Default (EoD). When a reserve unit triggers an EOD, it will forfeit Availability Payment for all the relevant Committed Windows.

Positive Balancing Reserve

For a generator (or a unit with only positive output):

MEL – FPN ≥ Contracted Quantity

For a supplier (or a unit with only negative output):

SIL – FPN ≥ Contracted Quantity

For a "through-zero" unit:

MEL – FPN ≥ Contracted Quantity

For a Power Park Module powered by an Intermittent Power Source:

PA – FPN ≥ Contracted Quantity

Negative Balancing Reserve

For a generator (or a unit with only positive output):

FPN – SEL ≥ Contracted Quantity

For a supplier (or a unit with only negative output):

FPN – MIL ≥ Contracted Quantity

For a "through-zero" unit:

FPN – MIL ≥ Contracted Quantity

For a Power Park Module powered by an Intermittent Power Source:

FPN – SEL ≥ Contracted Quantity

Dynamic Parameter definitions:
FPN – Final Physical Notification, MEL – Maximum Export Limit, SEL – Stable Export Limit, MIL – Maximum Import Limit, SIL – Stable Import Limit, PA – Power Available.

Performance monitoring

This section provides information on the application of the performance monitoring methodology for the Balancing Reserve. The unit participating in the service will be subject to performance monitoring on the Time to Full Delivery, Availability, Dispatch Flexibility and Utilisation. In the event of any conflict or inconsistency between this document and the Service Terms, the latter shall prevail.

Performance Monitoring of Dispatch Flexibility (EoD code "DFF")

A contracted unit must be capable of being dispatched during contracted service windows in accordance with the following rules:

- being dispatched from any prevailing Stable Export Limit or Stable Import Limit (which for the avoidance of doubt may be 0MW) or from any other higher level of Output or Demand
- being dispatched for all or part of its Contracted Quantity and in one or multiple consecutive increments of one 1MW
- being dispatched for a single or multiple consecutive periods each of not less than 1 minute duration (representing a minimum activation period) which for these purposes shall exclude Ramping Periods.

Dynamic Parameter definitions:
FPN – Final Physical Notification, MEL – Maximum Export Limit, SEL – Stable Export Limit, MIL – Maximum Import Limit, SIL – Stable Import Limit,

Positive Balancing Reserve

For a generator (or a unit with only positive output):

FPN ≥ SEL, or FPN = 0 and SEL = 1

For a supplier (or a unit with only negative output):

No additional check required*

For a "through-zero" unit:

If FPN > 0, FPN ≥ SEL,

If FPN = 0 then SEL = 0,1

If FPN < 0**, SIL = 0,-1 and SEL = 0,1

*BR contracted providers delivering from a negative FPN should ensure that their SIL does not impede their ability to be flexibly dispatched for all or part of the contracted quantity – this capability will be monitored via the availability check.

**When prequalifying for Balancing Reserve providers will self-declare whether they are a generator, supplier or a "through-zero" unit. If declared as a through-zero unit SIL and SEL should routinely be 0,1 or -1 to avoid failing this check when delivering BR from a FPN<0.

Negative Balancing Reserve

For a generator (or a unit with only positive output):

No additional check required***

For a supplier (or a unit with only negative output):

FPN ≤ SIL, or FPN = 0 and SIL = -1

For a "through-zero" unit:

If FPN > 0, SIL = 0,-1 and SEL = 0,1

If FPN = 0 then SIL = 0,1

If FPN < 0, FPN ≤ SIL

***BR contracted providers delivering from a positive FPN should ensure that their SEL does not impede their ability to be flexibly dispatched for all or part of the contracted quantity – this capability will be monitored via the availability check.

Performance monitoring

This section provides information on the application of the performance monitoring methodology for Balancing Reserve. The unit participating in the service will be subject to performance monitoring on the Time to Full Delivery, Availability, Dispatch Flexibility and Utilisation. In the event of any conflict or inconsistency between this document and the Service Terms, the latter shall prevail.

Performance Monitoring of Time to Full Delivery (EoD code "RESP")

A contracted unit must be capable of achieving the full contracted capacity within the Time to Full Delivery of 10 minutes this is inclusive of Notice to Offer (NTO) or Notice to Bid (NTB) time parameters. Whilst NTO/NTB can be set as low as 0 minutes, the Grid Code allows an NTO/NTB of 2 minutes (see BC2.7.3).

Note that the contracted BR unit is also expected to cease delivery of the BOA within 10 minutes (NTO/NTB time does not apply in the cessation of the BOA).

Time to Full delivery calculations

Positive Balancing Reserve Example

For a generator (or a unit with only positive output):

$$Time\ to\ full\ delivery\ [minutes] = \frac{Contracted\ capacity\ [MW]}{Run\ up\ rate\ export\ [\frac{MW}{minute}]}$$

For a supplier (or a unit with only negative output):

$$Time\ to\ full\ delivery\ [minutes] = \frac{Contracted\ capacity\ [MW]}{Run\ down\ rate\ import\ [\frac{MW}{minute}]}$$

For a bi-directional unit:

$$(if\ FPN\ \geq 0)$$

$$Time\ to\ full\ delivery\ [minutes] = \frac{Contracted\ capacity\ [MW]}{Run\ up\ rate\ export\ \left[\frac{MW}{minute}\right]}$$

$$(if\ FPN < 0)$$

$$Time\ to\ full\ delivery\ [minutes] = \frac{Contracted\ capacity\ [MW]}{Run\ down\ rate\ import\ [\frac{MW}{minute}]}$$

Run up is replaced with run down and vice versa for Negative Balancing Reserve to calculate the time to full delivery.

The check

For all units:

Time to full delivery (calculated as above) + Notice to Bid/Offer ≤ 10 minutes

Dynamic Parameter definitions:
FPN – Final Physical Notification

Performance monitoring

This section provides information on the application of the performance monitoring methodology for the Balancing Reserve. The unit participating in the service will be subject to performance monitoring on the Time to Full Delivery, Availability, Dispatch Flexibility and Utilisation. In the event of any conflict or inconsistency between this document and the Service Terms, the latter shall prevail.

Performance Monitoring of Utilisation (EoD code "CDEL")

The unit must be delivering within the acceptable ramping envelope in accordance to time to full delivery parameter, when ramping to and from the instructions. To clarify, the unit must cease from the instruction in the time defined as time to full delivery or 10 minutes.

Under-delivery below 95% expected output will mean availability payments for the relevant service window will be withheld. Over-delivery is not penalised by the performance monitoring.

For units which are armed for Mandatory Frequency Response (MFR) or contracted for a dynamic response contract in the opposite direction their response energy delivered will be used to adjust their FPN volume and ensure that units are not penalised for under-delivery when they are automatically adjusting output to manage frequency. This enables service stacking between BR and response services as per the "Service Stacking" guidelines.

The utilisation calculations

For all units

PBR: Expected output = Positive net BOA volume (MWh)

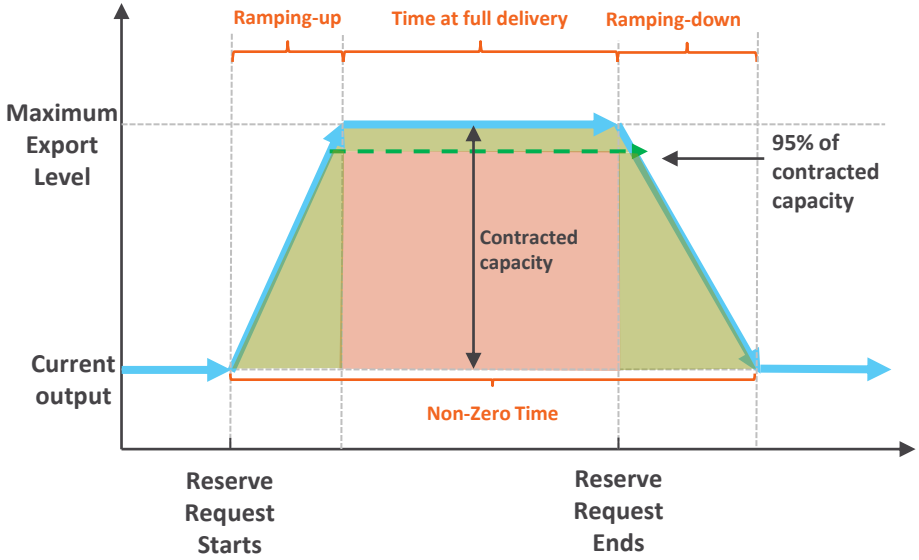
NBR: Expected output = Negative net BOA volume (MWh)

The check

For all units:

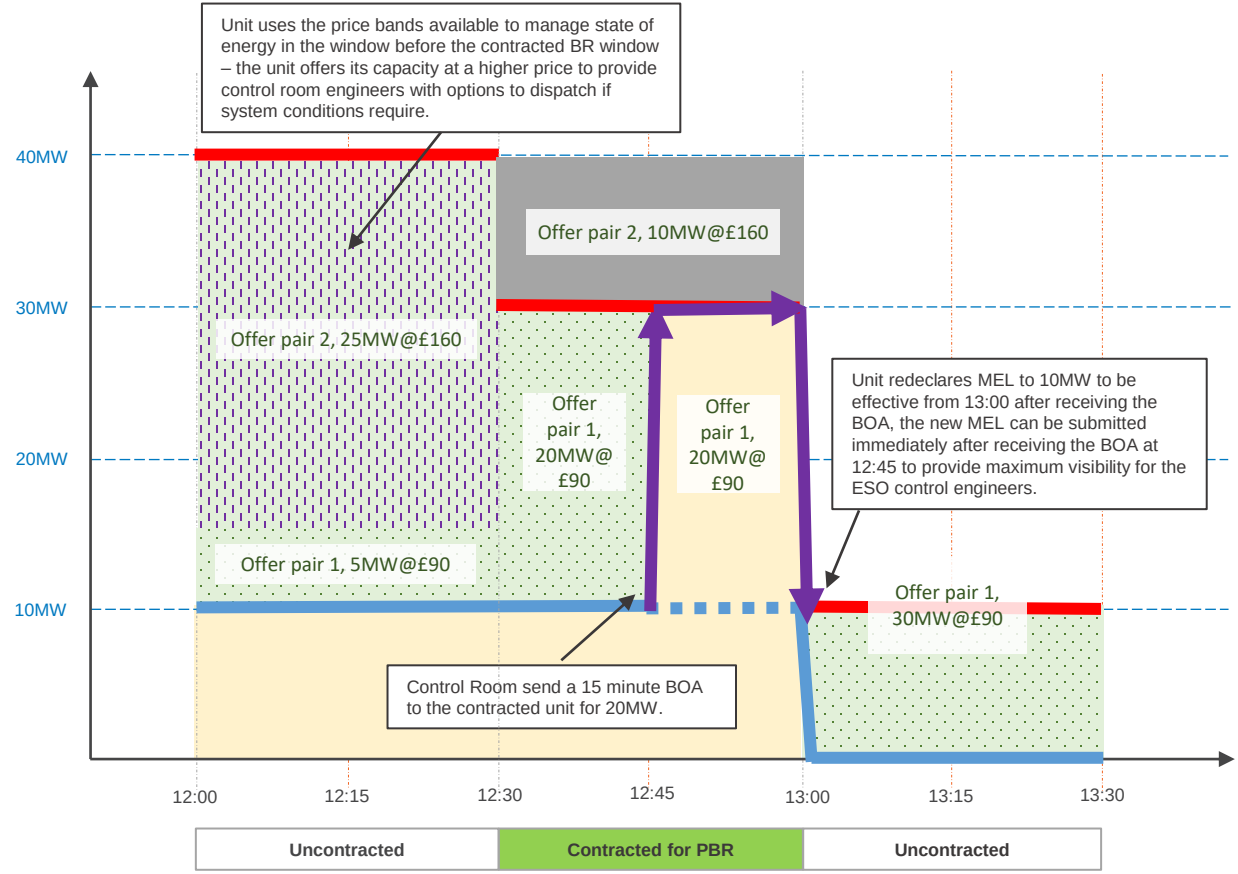
ABS(Settlement metering – FPN volume) ≥ ABS(Expected output * 95%)

Where ABS(…) is absolute value.



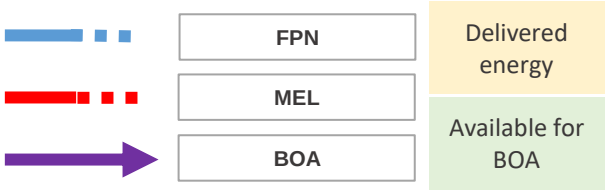
Dynamic Parameter definitions:
FPN – Final Physical Notification, BOA – Bid Offer Acceptance

Detailed example 1a – using price bands to manage state of energy (30 minute rule)



Unit characteristics

- The BESS has a maximum generation capacity (GC) of 40MW.
- The unit has submitted a run up rate of 40MW/minute. (although is assumed to ramp instantaneously)
- The unit does not have any response contracts.
- The unit is contracted for 20MW of Positive Balancing Reserve in BR Service Window 28.
- **At 12:00 the unit has 20MWh of stored energy available for discharge.**
- Settlement metering for SP26 (12:30 – 13:00) = 9.9MWh (a small under delivery)



Unit revenue

- The clearing price for SP26/SW28 in the DA BR auction was £15/MW/hour. For the contracted window the provider expects to be paid (£15*20)/2 = £150.
- The offer price of £160/MWh for Offer band 2 allows the provider to receive more revenue from an Offer than they would lose from the availability payment if they were dispatched before the contracted window.

Detailed example 1a – performance monitoring

Performance check (PBR) SP26:

Availability

→ MEL – FPN ≥ 20MW
→ (30 – 10) ≥ 20
→ **CORRECT**

This unit has slightly underdelivered: Settlement Metering = 9.9MWh but FPN + Offer volume = 10MWh. However, this is within the 5% tolerance and so there is no impact on the units' availability payments for BR. Any BOA under delivery may still be penalised under the BSC.

Utilisation

→ Settlement Metered volume – FPN volume >= Expected Output*0.95
→ 9.9 - 5 ≥ (5)*0.95
→ **CORRECT**

Time to full delivery

→ Contracted quantity / Run up Rate + NTO <= 10 minutes
→ (20 / 40) + 2 <= 10
→ 2.5 <= 10
→ **CORRECT**

Flexible dispatch

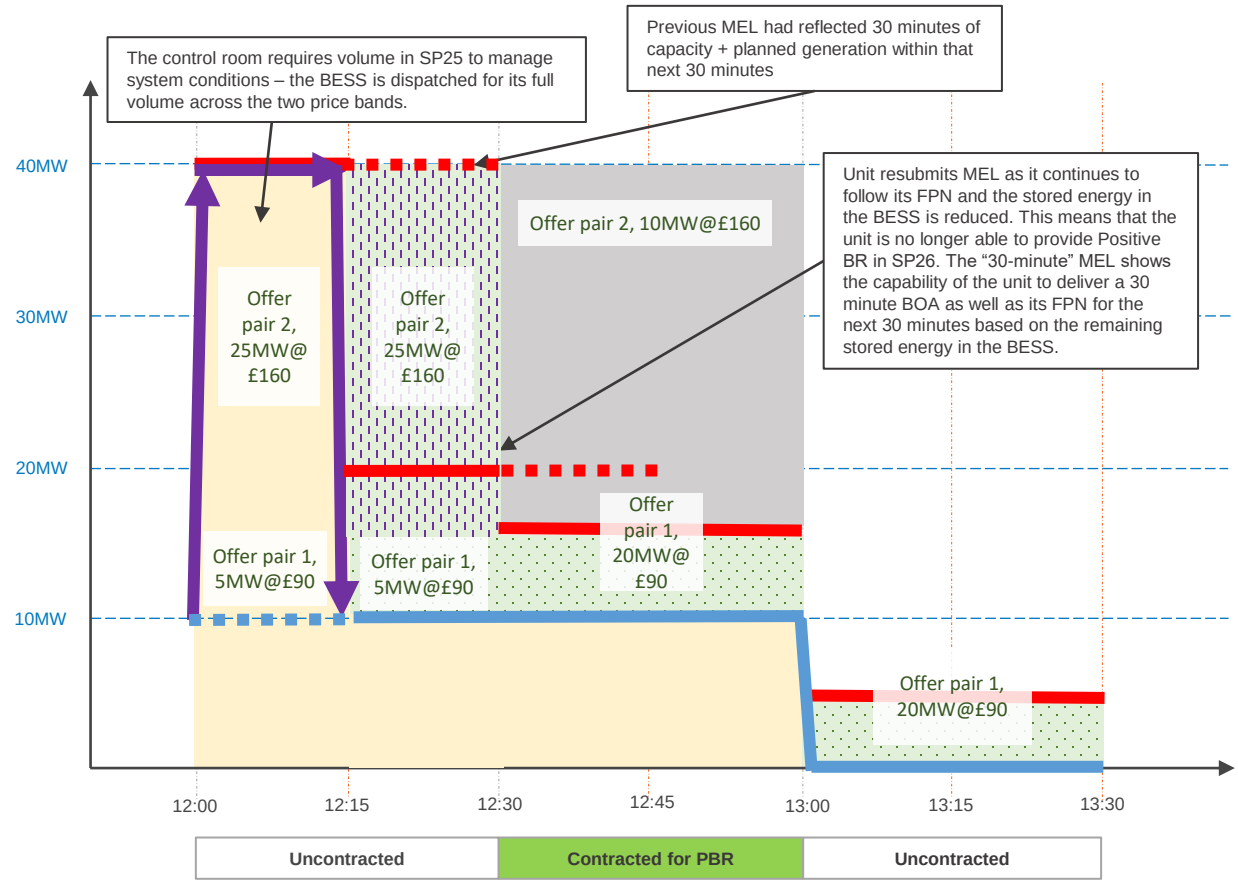
→ FPN ≥ SEL (if FPN >0)
→ SEL= 0MW for this BESS BMU
→ **CORRECT**

Unit revenue

- The unit passed all 4 of the performance monitoring checks.
- BR Availability payment = £150
- BM Offer payment = 20MW*0.25hour*£90/MWh = £450

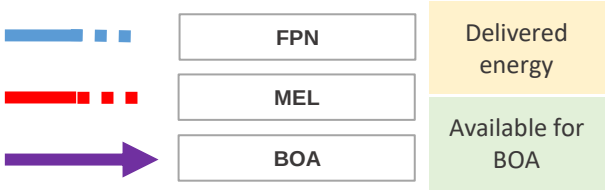
- Total revenue from ESO from 12:00 – 13:30 = £600

Detailed example 1b – using price bands to manage state of energy (30 minute rule)



Unit characteristics

- The BESS has a maximum generation capacity (GC) of 40MW.
- The unit has submitted a run up rate of 40MW/minute. (although is assumed to ramp instantaneously)
- The unit does not have any response contracts.
- The unit is contracted for 20MW of Positive Balancing Reserve in BR Service Window 28.
- **At 12:00 the unit has 20MWh of stored energy available for discharge.**
- Settlement metering for SP26 (12:30 – 13:00) = 5MWh



Unit revenue

- The clearing price for SP26/SW28 in the DA BR auction was £15/MW/hour. For the contracted window the provider expects to be paid (£15*20)/2 = £150.
- The offer the unit received at 12:00 allowed total revenue of 5*0.25*£90 + 25*0.25*£160 = £1112.50.

Detailed example 1b – performance monitoring

Performance check:

Availability

→ MEL – FPN ≥ 20MW
→ (15 – 10) ≥ 20
→ **INCORRECT**

Utilisation

→ Settlement Metered volume >= (BOA + FPN volume)*0.95
→ *0 BOA volume* → **PBR NOT CHECKED**

Time to full delivery

→ Contracted quantity / Run up Rate + NTO <= 10 minutes
→ (20 / 40) + 2 <= 10
→ 2.5 <= 10
→ **CORRECT**

Flexible dispatch

→ FPN ≥ SEL (if FPN >0)
→ SEL= 0MW for this BESS BMU
→ **CORRECT**

Unit revenue

- The unit failed the check on availability. 100% of the BR availability is withdrawn,
- BR Availability payment = £0
- BM Offer payment = £1112.50

- Total revenue from ESO from 12:00 – 13:30 = £1112.50

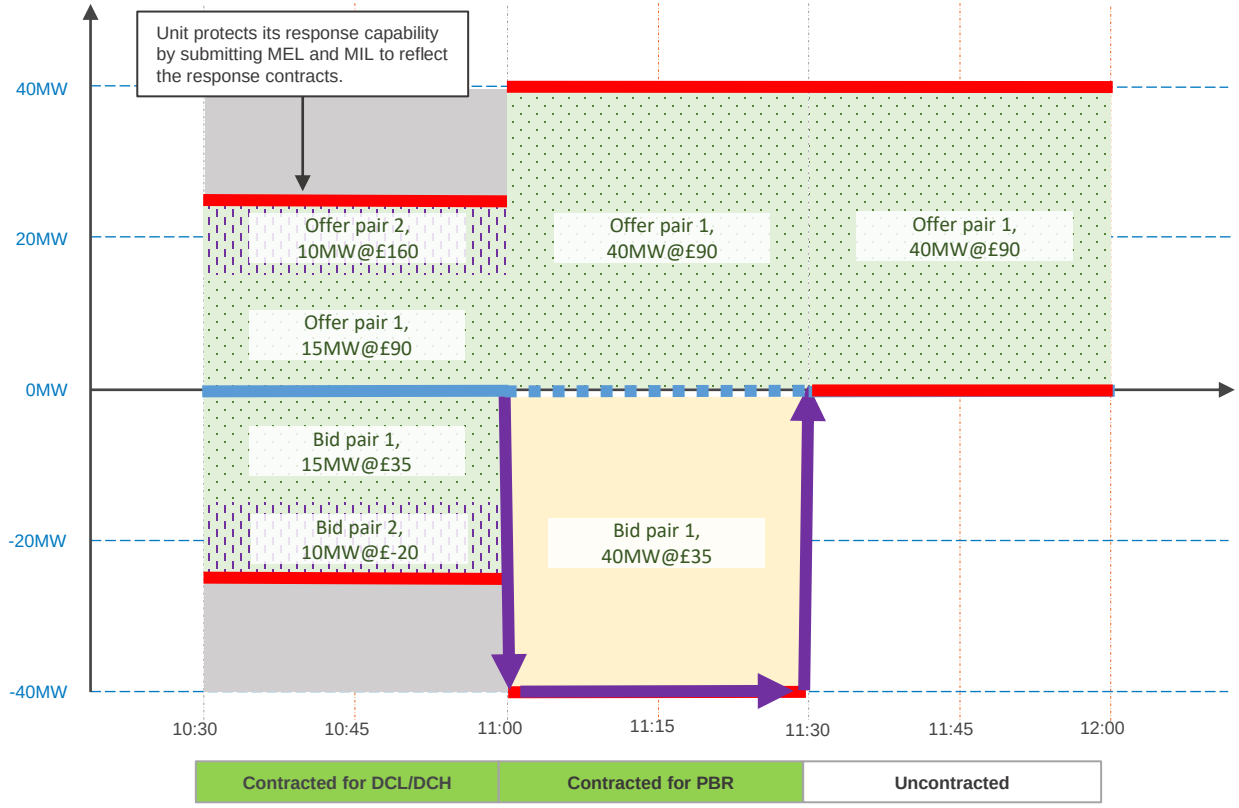
Note:
We do not consider this commercial unavailability as the unit was dispatched by ESO through a BOA which led to its energy limitations (see 15.1.1 in the BR service terms below which carves out BOAs as an acceptable reason for a planned change in output that reduces BR capacity). Therefore, the unit is not at risk of being levied a cost of reimbursement for replacing the reserve volume which has been exhausted.

15. Provision of Other Services

15.1 The **Service Provider** undertakes to **NGESO** that the availability and delivery of **Balancing Reserve** from any **BR Unit** pursuant to and in accordance with a **BR Contract** and these **BR Service Terms** will not at any time during any **Contracted Service Window** (including during any **Transfer Period**) be impaired or otherwise prejudiced by:-

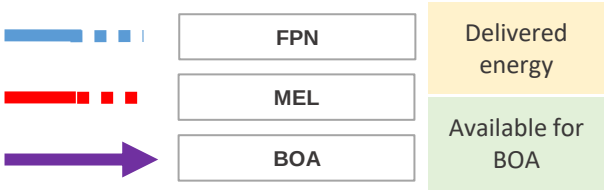
15.1.1 any planned increase or reduction (as the case may be) in **Output** of that **BR Unit** which reduces the **BR Capacity** to less than the **Contracted Quantity** otherwise than pursuant to a **Bid-Offer Acceptance** (which for the avoidance of doubt shall exclude for these purposes any unplanned outage of the **BR Unit** caused by a breakdown **of Plant or Apparatus**); and/or

Detailed example 2 – contracted response capability (30 minute rule)



Unit characteristics

- The BESS has a maximum generation capacity (GC) of 40MW.
- The unit has submitted a run up and run down rate of 40MW/minute. (although is assumed to ramp instantaneously)
- The unit has a DCL and DCH contract for EFA 3 each for 15MW.
- The unit is contracted for 20MW of Positive Balancing Reserve in BR Service Window 25.
- **At 10:30 the unit has 20MWh of stored energy available for discharge.**
- Settlement metering for SP22 (10:30 – 11:00) = 0MWh [high and low response contracts cancel each other out in this example]
- Settlement metering for SP23 (11:00 – 11:30) = -20MWh



Unit revenue

- Clearing price for PBR = £27/MW/hour
- Bid = (-40*0.5)*35 = -£700.
- DCL clearing price = £0.58/MW/hour
- DCH clearing price = £1.98/MW/hour

Detailed example 2 – performance monitoring

Performance check (PBR) SP23:

Availability

→ MEL – FPN ≥ 20MW
→ (40 – 0) ≥ 20
→ **CORRECT**

Although the unit received a bid in the BM during this period the only assessment for a PBR contract is net positive BOA volume. The BOA volume was net negative and therefore there are no checks made here.

Utilisation

→ Settlement Metered volume >= (BOA + FPN volume)*0.95
→ *net negative BOA volume* → **PBR NOT CHECKED**

Time to full delivery

→ Contracted quantity / Run up Rate + NTO <= 10 minutes
→ (20 / 40) + 2 <= 10
→ 2.5 <= 10
→ **CORRECT**

Flexible dispatch

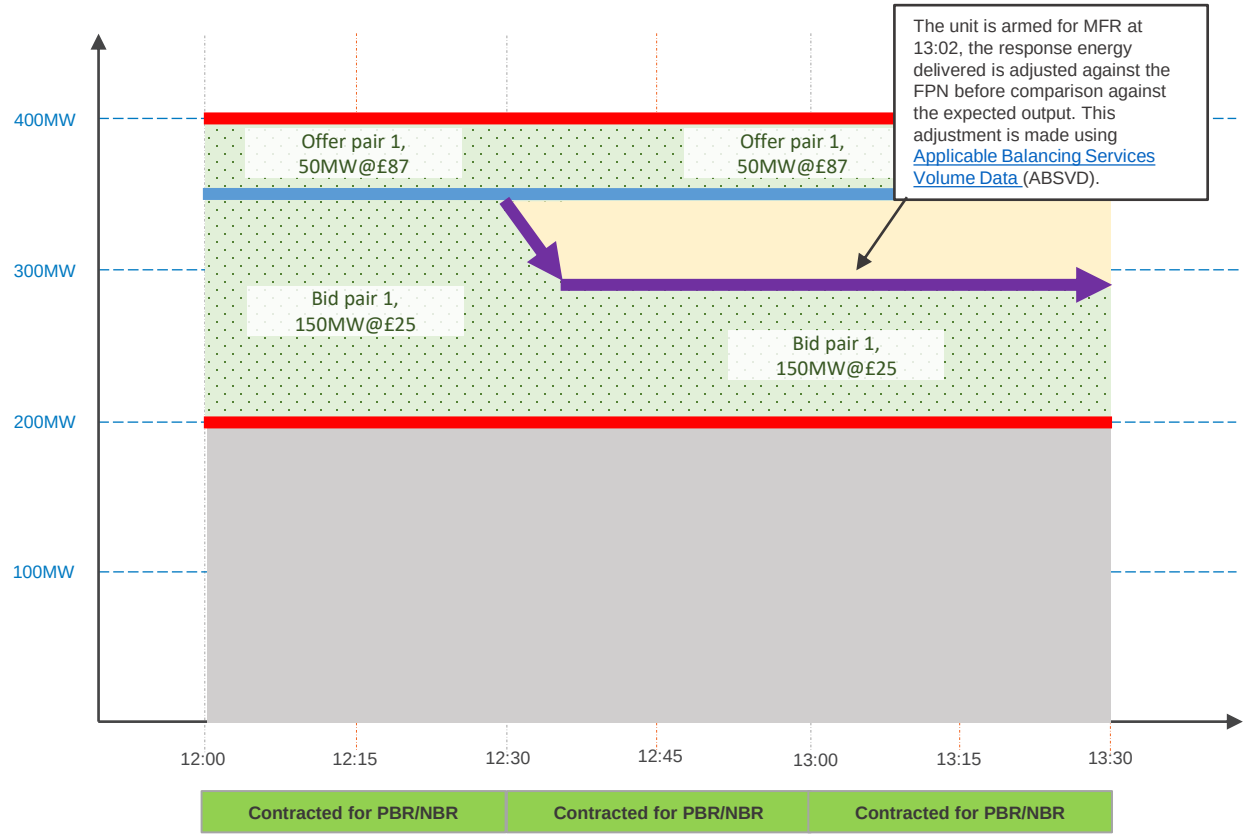
→ FPN ≥ SEL (if FPN >0)
→ SEL= 0MW for this BESS BMU
→ **CORRECT**

Unit revenue

- The unit passed all 4 of the performance monitoring checks.
- BR Availability payment = £270
- BM bid payment = -40MW*0.5hour*£35/MWh = -£700
- DCL revenue for 10:30 – 11:00 = 15MW*0.5hour*£0.58/MW/hr = £4.35
- DCH revenue for 10:30 – 11:00 = 15MW*0.5hour*£1.98/MW/hr = £14.85

- Total revenue from ESO from 10:30 – 12:00 = -£410.80

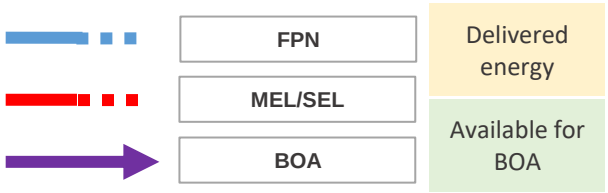
Detailed example 3 – ramp rate checks



The unit is armed for MFR at 13:02, the response energy delivered is adjusted against the FPN before comparison against the expected output. This adjustment is made using Applicable Balancing Services Volume Data (ABSVD).

Unit characteristics

- This CCGT unit has a maximum generation capacity of 400MW and a SEL of 200MW.
- The unit has submitted a run up and run down rate of 12MW/minute.
- The unit is contracted for 50MW of Positive BR and 150MW of Negative BR
- Settlement metering for SP25 (12:00 – 12:30) = 175MWh
- Settlement metering for SP26 (12:30 – 13:00) = 147.5MWh
- Settlement metering for SP27 (13:00 – 13:30) = 150MWh
- ABSVD for SP27 (13:00 – 13:30) = 5MWh



Detailed example 3 – performance monitoring

Performance check (PBR) SP25, 26, 27

Availability

→ MEL – FPN ≥ 50MW
→ (400 – 350) ≥ 50
→ **CORRECT**

Utilisation → no Offers → **NOT CHECKED**

Time to full delivery

→ Contracted quantity / Run up Rate + NTO <= 10 minutes
→ (50 / 12) + 2 <= 10
→ 6.17 <= 10
→ **CORRECT**

Flexible dispatch

→ FPN ≥ SEL (if generator)
→ 350 ≥ 200
→ **CORRECT**

Performance check (NBR) SP25, 26, 27

Availability

→ FPN – SEL ≥ 150MW
→ (350 – 200) ≥ 150
→ **CORRECT**

Time to full delivery

→ Contracted quantity / Run up Rate + NTB <= 10 minutes
→ (150 / 12) + 2 <= 10
→ 14.5 <= 10
→ **INCORRECT**

Flexible dispatch

→ FPN ≥ SEL (if FPN >0)
→ 350 ≥ 200
→ **CORRECT**

Unit revenue

- This unit has overcommitted NBR volume – the contracted quantity of 150MW is not achievable in 10 minutes with the unit's run down rate of 12MW/minute.
- The unit will not receive availability payment for the NBR contract in any of the contracted windows, PBR contract is not affected.

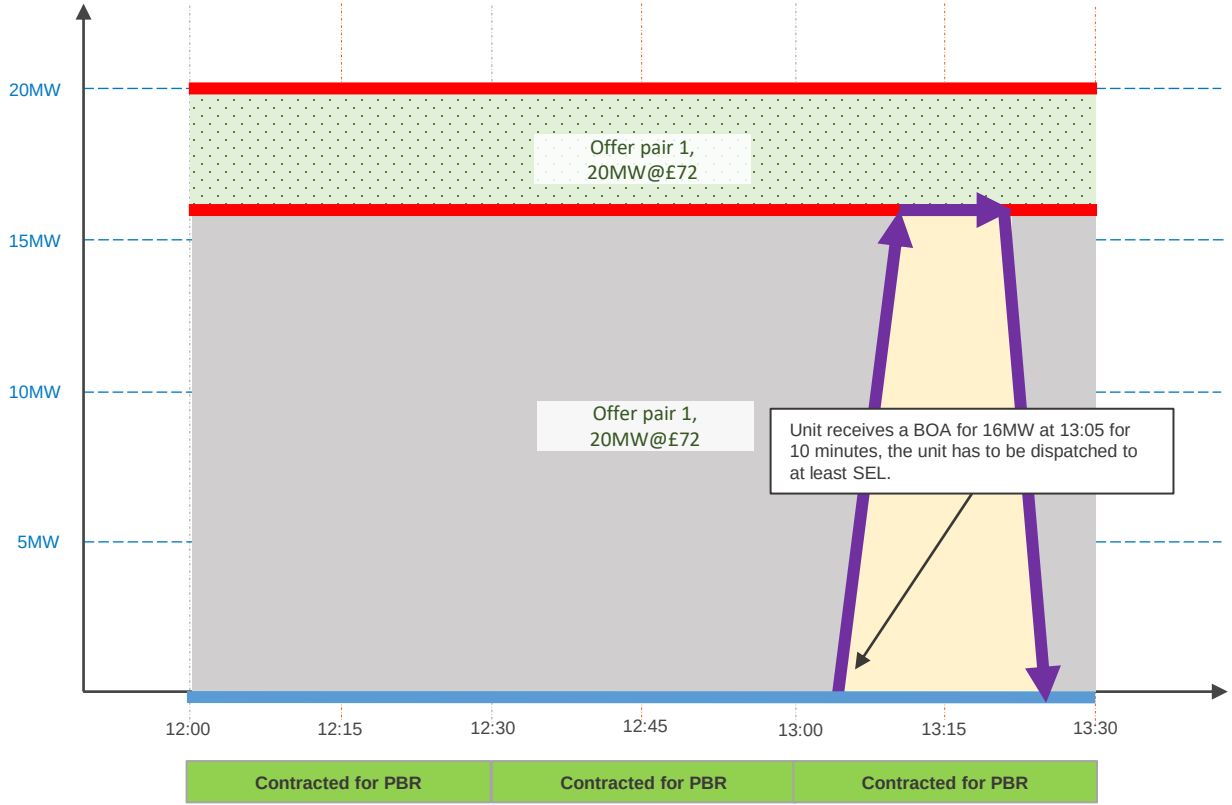
Performance check (NBR) SP25
Utilisation
→ Expected output = 0
→ **NOT CHECKED**

Performance check (NBR) SP26
Utilisation
→ Settlement metering – FPN volume ≥ Expected output * 95%
→ 147.5 – 175 ≥ -27.5*0.95
→ **CORRECT**

Performance check (NBR) SP27
Utilisation
→ ABS(150 – (175 + 5)) ≥ ABS(-30*0.95)
→ **CORRECT**

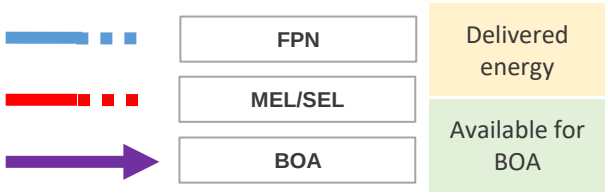
The ABSVD has been applied to make an adjustment to the FPN volume. This removes the effect of the response energy from the check.

Detailed example 4 – dispatch flexibility



Unit characteristics

- This BM unit has a maximum generation capacity of 20MW and a SEL of 16MW.
- The unit has submitted a run up and run down rate of 8MW/minute.
- The unit is contracted for 10MW of Positive Balancing Reserve
- Settlement metering for SP25 (12:00 – 12:30) = 0MWh
- Settlement metering for SP26 (12:30 – 13:00) = 0MWh
- Settlement metering for SP27 (13:00 – 13:30) = 3.2MWh



Detailed example 4 – performance monitoring

Performance check (PBR) SP25, 26, 27

Availability

→ MEL – FPN ≥ 10MW
→ (20 – 0) ≥ 10
→ **CORRECT**

Time to full delivery

→ Contracted quantity / Run up Rate + NTO <= 10 minutes
→ (10 / 8) + 2 <= 10
→ 3.25 <= 10
→ **CORRECT**

Flexible dispatch

→ FPN ≥ SEL (if generator)
→ 0 ≥ 16
→ **INCORRECT**

Performance check (PBR) SP25,26

Utilisation
→ no Offers
→ **NOT CHECKED**

Performance check (PBR) SP27

Utilisation
→ 3.2 – 0 ≥ 3.2*0.95
→ **CORRECT**

Unit revenue

- This unit has failed the dispatch flexibility check as it cannot be dispatched incrementally between its FPN of 0MW and its SEL of 16MW. This means that the contracted reserve is not flexible.
- The unit should deliver Positive Balancing Reserve from its SEL of 16MW, it could then be incrementally dispatched between FPN=SEL=16MW and its MEL of 20MW. The maximum volume the unit could be contracted for is 4MW of Balancing Reserve.
- The unit will not receive availability payment for the PBR contract in any of the contracted windows.

Operational Data

ESO

Pre-gate closure data

Contracted Balancing Reserve (BR) providers need to submit BM data to the ESO via EDL/EDT. This data should be submitted in accordance with the Grid Code (in particular BC1 and BC2).

ESO engineers calculate the expected operating margin repeatedly between 24 hours and 4 hours ahead of real time. These margin assessments provide key information to notify dispatch engineers that warming instructions are needed to synchronise cold plant and ensure reserve is available in real time.

The introduction of Balancing Reserve means that some contracted reserve volume is known at 09:00 the Day Ahead of delivery and therefore these contracted volumes will be included in the engineer's margin assessments.

To help us to ensure the margin assessments are as accurate as possible we would appreciate contracted BM units submitting Day Ahead Submissions even when not mandated to do so by the Grid Code.

Data should then be revised if new information becomes available to the BM Participant.

Reminder of data relevant for Balancing Reserve:

Maximum Export Limit (MEL)

Maximum Import Limit (MIL)

Stable Export Limit (SEL)

Stable Import Limit (SIL)

Run-up Rate

Run-down Rate

Minimum Non-Zero Time (MNZT)

Minimum Zero Time (MZT)

Bid/Offer pairs

Notice to Offer (NTO)

Notice to Bid (NTB)

Energy Limited Assets

Battery Energy Storage Systems (BESS) and Pumped Storage have energy limitations depending on the storage capacity of their equipment. BESS can participate in the BR auctions but are expected to be able to manage their state of energy to be able to deliver the full contracted quantity for the duration of the BR service window.

We have published guidance on the submission of MEL/MIL parameters, please read this guidance note from December 2023 to learn more.

An update with the 30 minute rule was published in February 2024.

Extract from the BR service terms

5.12 Without prejudice to paragraph 5.11, and with respect to any **Contracted BR Unit** and **Contracted Service Window**, **Balancing Reserve** shall be deemed unavailable for the entirety of that **Contracted Service Window** if, at any time during that **Contracted Service Window**:-

5.12.1 the prevailing **Dynamic Parameters** (or any of them) submitted by the **Service Provider** are in any way inconsistent with the **Dispatch Flexibility Rules**; or

5.12.2 the **Contracted BR Unit** becomes incapable of delivering the full **Contracted Quantity** for the remainder of that **Contracted Service Window**; or

5.12.3 there is no, or ceases to be any, personnel employed by or contracted to the **Service Provider** present and tasked with responding to signals from **Control Telephony** or **System Telephony** relating to that **Contracted BR Unit**.

Data and Transparency

Registered Service Providers will be required to submit Operational Data, as outlined in the Service Terms.

No performance data needs to be submitted by contracted BR providers, ESO will use its own data to performance monitor the units at a 30minute granularity. Operational data should be submitted via BM systems (e.g. EDT/EDL).

Details of the BR auction results including a breakdown of each Sell Order, ESO's Buy Order and results summaries will be available on the data portal by 09:00 every morning. The format is shown in the BR-Mock auctions page on the ESO Data Portal – please keep an eye out for the live auction results.

Details of unit dispatch can be found via the Dispatch Transparency dataset or through ELEXON's website.

Continuing the conversation

Email us with your views on this Guidance Document at: Box.FutureofBalancingServices@nationalgrideso.com and one of our team members will get in touch.

Access our Balancing Reserve documents, data and multimedia at the following links:
Balancing Reserve

Write to us at:

Electricity System Operator
Faraday House
Warwick Technology Park
Gallows Hill Warwick CV34 6DA