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P323 'Enabling inclusion and treatment of SBR in the Imbalance Price'

P323 enable the value of Supplemental Balancing Reserve (SBR) to be included in the imbalance price calculation without affecting Balancing Mechanism (BM) Cashflows. This is being implemented in line with the implementation of approved Modification Proposal P305 'Electricity Balancing Significant Code Review Developments'. This is because it is necessary that other elements of P305 are in place (e.g. the Value of Lost Load (VoLL) price) and to avoid delays so that the market receives the appropriate signals.

The Authority has **approved** P323 for implementation on **5 November 2015**

This Modification is expected to impact:

- The Transmission Company
- ELEXON
- The Settlement Administration Agent (SAA)
- Trading Parties

Phase

Initial Written Assessment

Definition Procedure

Assessment Procedure

Report Phase

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About This Document

The Authority/BSC Panel has approved P323 for implementation on **5 November 2015**, as part of the November 2015 BSC Release.

This document sets out the final requirements for the P323 approved solution, for handover to the Release Manager.

For further background to P323, please refer to the P323 Final Modification Report, which is available on the P323 page of the ELEXON website.

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Background

Balancing services are used by the Transmission Company (TC) in its role as System Operator (SO) to balance supply and demand in real time. These are also used in the calculation of imbalance prices (also known as cash-out prices).

In December 2013, Ofgem published its decision to accept an application by the TC to introduce two new balancing services: Supplemental Balancing Reserve (SBR) and Demand Side Balancing Reserve (DSBR).

SBR

The SBR service makes available generation that would otherwise be unavailable in the market. This generation is held in reserve and will only be used in the event that there is insufficient generation capacity available in the market to meet demand. SBR provides a means for generators operating outside the wholesale market to contribute to balancing the system in winter periods of high demand.

DSBR

The DSBR service is aimed at non-domestic consumers with the ability to reduce demand/load shift or run small embedded/on-site generation for at least an hour during a winter evening peak period. At the highest level, this will enable the SO to ask large energy users to reduce their demand in exceptional circumstances, and would remunerate them for doing so.

Current Arrangements

Under the current BSC arrangements, if either SBR or DSBR are used then the relevant actions taken by the SO will not be accurately reflected in the imbalance price.

DSBR actions are excluded from the imbalance price calculations as they are not permitted to be included in the Balancing Service Adjustment Data (BSAD), as per the BSAD Methodology Statement.

SBR actions are included in the calculation of imbalance prices since the SO dispatches SBR through the BM like other Balancing Mechanism Units (BMUs). However, BOAs taken for SBR providers are SO-Flagged, as per the System Management Action Flagging (SMAF) Methodology Statement. The SMAF Methodology Statement classes SBR actions as being 'System Management'. This means that the price of the action will not be higher than the most expensive energy balancing action in that Settlement Period.

Since SBR and DSBR were designed as last resort services to be called upon at times of severe system scarcity, factoring these services' actions into imbalance prices is necessary in order to accurately reflect all actions the TC may take to balance the system in a Settlement Period.

What are balancing services?
Balancing services are used by the TC in its role as SO to balance supply and demand in real time. These are also used in the calculation of imbalance prices (also known as cash-out prices).

BSAD methodology statement
The BSAD Methodology Statement sets out what SO actions are taken outside of the Balancing Mechanism (BM) to balance the system.

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Issue 56

On 8 May 2014, the TC raised Issue 56 'Treatment of the new SBR and DSBR services in the imbalance price'. They wanted to find an appropriate way to reflect DSBR and SBR in the calculation of imbalance prices in case the services were used over winter 2014/15.

The Issue 56 Group concluded that:

- DSBR and SBR actions should be reflected in the imbalance price.

- Any solution for pricing DSBR actions should also apply to SBR actions. Although the DSBR solution to be implemented ahead of winter 2014/15.

- DSBR and SBR actions should be priced at VoLL, which should be set at £3,000 to be consistent with Ofgem's EBSCR Policy.

ELEXON advised the TC and the Issue Group that the recommended solution would not require a change to the BSC. However, it would require a change to the BSAD Methodology Statement.

Open Letters and workshops

On 14 July 2014 the TC issued an open letter to the industry regarding the next steps to be taken for the treatment of DSBR and SBR actions in the imbalance price. Following responses to the open letter, the TC decided that it would be more appropriate to reflect DSBR and SBR actions in the imbalance price at a later date. Potentially, this would be in line with the progression of P305 'Electricity Balancing Significant Code Review Developments'.

On 10 February 2015, the TC held a workshop to revisit the issue of including DSBR and SBR in the imbalance price with respect to winter 2015/16. The attendees largely agreed with the views expressed by the Issue 56 Group and the respondents to the July Open Letter.

On 15 June 2015, the TC sent a further open letter to the industry to seek views on how to include SBR in the imbalance price.

In this open letter the TC makes it clear that although SBR actions should be reflected in the main energy imbalance price, they should not impact the BM cashflow. This is because the TC would price an SBR action at the value of VoLL for that Settlement Period, which will be set at £3,000 from 5 November 2015. This means that some Parties providing SBR services could benefit from larger pay-outs than they had expected as part of their SBR contracts.

The letter also sets out an approach for the treatment of SBR in regards to 'ramping'. Physical constraints of an SBR unit may require a period of ramping up to, and down from, their minimum generation levels (Stable Export Limit (SEL)) before they can be dispatched for SBR purposes.

The TC noted that it does not seem appropriate for a VoLL price to be applied to an SBR unit unless it is for a Settlement Period when its generation is actually required, i.e. output above SEL. Therefore, the TC proposed that ramping periods (where generation volume is greater than '0' and less than SEL) should not be priced at VoLL, but treated in a different manner in the imbalance price.

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The Transmission Company's open letter to the industry can be found on the [National Grid website](#).

What is the issue?

Whilst Issue 56 did not recommend the need for a BSC Modification to include the value of SBR in the calculation of imbalance prices, the TC invited ELEXON to review its second open letter before publishing it.

At this point ELEXON identified that it would not be possible to re-price a BOA for the purposes of calculating imbalance prices without there being consequential impacts on BM Cashflow.

ELEXON advised the TC that a Modification would be required to allow SBR actions to be priced at one value in the main imbalance price calculation (i.e. at VoLL) and at another value in the BM cashflow (i.e. the original BOA's utilisation price).

Related Changes

Change to C16 methodologies

It should be noted that in order to enable the TC to reflect SBR and DSBR actions in the imbalance price calculation it must modify its SMAF Methodology Statement and BSAD Methodology Statement.

These are statements required by Standard Condition C16 of the TC's Licence. The extent of these necessary changes is set out in the TC's open letter published on 15 June 2015. P323 is conditional on the outcome of the C16 review.

Full details of the TC's consultation on the C16 statement amendments can be found on the [National Grid webpage](#).

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Approved solution

P323 enables the calculation of imbalance prices to include the value of SBR whilst not affecting the calculation of BM Cashflows. P323 will achieve this by enabling the TC to identify specific BOAs taken for SBR purposes[1] and for resulting System Actions to be priced at VoLL for imbalance price calculations only.

ELEXON will implement a manual solution so that no changes to Central Systems are necessary (at least initially). This will be achieved by amending the BSC so that an enduring solution (that will rely on changes to Central Systems) is clearly defined. However, in the absence of system changes, an obligation will require ELEXON to ensure imbalance prices calculated for Settlement Periods reflect the value of SBR Actions where they are taken.

In the absence of changes to Central Systems, ELEXON will meet this obligation by operating a manual process outside of Central Systems that ultimately has the effect of adjusting any price produced by the SAA.

The remainder of this section explains the solution in more detail. The assumptions and detailed requirements are set out in Section 3.

The P323 solution is split in two parts. The first part describes how SBR would be reflected in the calculation of imbalance prices using the BSC Central Systems. The second part describes SBR would be reflected in the calculation of imbalance prices using a manual process outside of the BSC Central Systems.

An enduring solution

In practice the Balancing Mechanism Reporting Agent (BMRA) and SAA deliver the BSC requirements for calculating and publishing imbalance prices by using automated processes. Ideally any change to the calculation of imbalance prices should be incorporated with the existing systems and processes. This ensures integrity and simplicity.

Additionally, whilst the TC initially procured SBR services as a temporary Balancing Service, there is a growing expectation that the TC may procure SBR for several years yet.

The enduring solution proposed by P323 requires the following:

- Whenever the TC dispatches a BMU for SBR purposes, it will identify those SBR BOAs with an SBR Flag in a similar way to how it SO-Flags and STOR-Flags BOAs.

- The BMRA and SAA will treat BOAs with an SBR Flag so that, for the purposes of calculating imbalance prices only, any derived System Actions will be known as SBR Actions and will have an SBR Action Price, which is set equal to VoLL.

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[1] 'Taken for SBR purposes' in the context of the BSC means to accept an action offered by an SBR provider where the provider's generation output would exceed its SEL for a period of time. For the avoidance of doubt, any accepted action offered by an SBR provider where its output is below, at, or is 'ramped up' or 'ramped down' from SEL are not considered to have been taken for SBR purposes. It also excludes actions taken for purposes other than SBR, such as actions taken for constraints.

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- SBR Actions will be treated like any other System Action in the existing imbalance price calculation.

- Irrespective of whether the TC takes a BOA for SBR purposes, the SAA will continue to use the original PO for SBR BOAs for calculating BM Cashflows.

The intention of P323 is for the solution to be similar to the approach to re-pricing System Actions from STOR Providers (as set out by P305). Under P305, System Actions determined to be STOR Actions, are re-priced to equal the RSP for the purposes of the imbalance price calculation only, and the original PO(s) are used for BM cashflow.

Manual process solution

In order to ensure that P323 can be implemented in time for the November 2015 BSC Release (as requested by the TC), no BSC System changes were proposed under this Modification, for the reasons provided below:

- SBR and DSBR are last resort activities and in general are unlikely to be dispatched regularly[2];

- SBR and DSBR are intended as temporary measures available to the TC whilst the Electricity Market Reform (EMR) is implemented[3], which means that the benefits of system changes would be time-limited;

- there is limited time left to make changes to BSC Systems; and

- the scheduled November 2015 Release already contains a large number of significant changes to BSC Systems, e.g. P305, therefore any additional BSC System changes would pose a risk to implementation.

Consequently P323 proposed that a temporary manual process be implemented to ensure that the intent of the 'enduring' solution as described above is delivered.

The P323 manual process relies on the following steps:

- The TC sends an SBR Notice to ELEXON of BOAs taken for SBR purposes. This notice is sent after the event.

- ELEXON uses its own systems to calculate imbalance prices in accordance with the requirements of Section T, without the use of BSC Systems. Specifically, for an impacted Settlement Period, ELEXON will produce an imbalance price that re-prices SBR Actions at VoLL and an imbalance price that does not re-price SBR Actions at VoLL (i.e. the price that BMRA and SAA would calculate in the absence of system changes).

- By comparing the re-calculated imbalance prices the difference determines an adjustment to the Buy Price Adjuster (BPA). By adjusting the BPA originally provided by the TC and resubmitting it to BSC Systems, the price calculated by BSC Systems will be corrected to reflect the price BSC Systems should have calculated if it had re-priced the SBR Action.

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[2] SBR and DSBR were procured for the first time for use during the 2014/15 winter but were not called on.
[3] The EMR arrangements are intended to be in place by 2019.

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In order that the revised BPA is included in the SAA's price calculation, ELEXON will advise the TC of the BPA it should submit to the SAA so the TC can include this revised BPA in its submission of BSAD to the SAA.

- ELEXON will send details of the imbalance price it expects the SAA to produce. Should the SAA produce a price that is different to the expected price, the SAA will notify ELEXON who will investigate and determine an appropriate way forward.

- The TC will send details of changes to Bid Offer Data, Acceptance Data and BSAD to ELEXON ahead of each Settlement Run to ensure that ELEXON is able to calculate an accurate adjustment to the BPA.

- ELEXON will publish details of any SBR Notice it receives and the calculations it completes as part of this manual process.

- ELEXON will maintain clear and robust controls and audit records.

There is precedence for this approach to manually adjusting imbalance prices at the time of market opening. In particular, Modifications P10 'Eliminating Imbalance Price Spikes Caused By Truncating Effects' and P18 'Removing / Mitigating The Effect of System Balancing Actions in The Imbalance Price'.

Because the TC will notify ELEXON of SBR BOAs after the end of a Settlement Period, the re-calculation of the imbalance price will take effect after the Balancing Mechanism Reporting Agent (BMRA) has produced its indicative prices and published these on the Balancing Mechanism Reporting Service (BMRS) (i.e. within 15 minutes of the end of the Settlement Period). Whilst the BMRA's indicative price calculation would not reflect any SBR Action, it is expected that any re-calculation and adjustment (as described above) would take place in time for the SAA's Interim Information (II) Run price calculation and all subsequent Reconciliation Runs.

If the Panel believe that system changes will be required in the future, a Change Proposal (CP) can be raised to progress them.

Implementation Date

P323 will be implemented on 5 November 2015 as part of the November 2015 BSC Release.

Impact on Code

Attachment A contains the changes to the BSC.

Impact on CSDs and other Configurable Items

Attachments B to E contain the changes to the CSDs.

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3   Detailed Requirements

This Section details the solution requirements, including the assumptions, for the P323 solution.

Assumptions

Assumptions	
The following assumptions relate to the P323 solution.	
A1	The TC dispatches SBR providers for SBR purposes using a specific (unique) BOA (an SBR BOA).
	These are BOAs to take an SBR provider's BMU's agreed output above its SEL.
A2	Any BOAs taken to instruct an SBR provider's output up to or down from SEL (but not above SEL) are not for SBR purposes.
	The TC will dispatch ramping or testing activity by an SBR provider using a separate BOA to those taken for SBR purposes (see A1). These BOAs are not SBR BOAs and resulting System Actions will not be repriced at VoLL.
	BOAs taken from SBR providers for constraint purposes or other than SBR purposes will not be an SBR BOA.
	In addition BOAs taken for ramping or testing purposes will be SO-flagged.
A3	ELEXON will implement P323 without changing Central Systems. This means that ELEXON will also need to implement a manual process that enables it to ensure imbalance prices are calculated accurately.
A4	Enduring solution – TC notification is before the event (i.e. by using SBR Flag)
	Manual solution – TC notification is after the event (i.e. by using SBR Notice)
A5	TC will provide ELEXON with prior notice of changes to Main Price inputs prior to the II Run and in between Settlement Runs.
	This is to allow ELEXON to produce the BPA adjuster that takes account of these changes. Otherwise, adjustment to Main Price will be incorrect.

Detailed requirements

Requirement 1	
The BSC Panel is responsible for determining whether the BMRA and SAA are capable of processing SBR BOAs without manual intervention.	
1.1	As and when appropriate, the BSC Panel will confirm that the BMRA and SAA are capable of processing SBR BOAs by receiving BOAs with an SBR Flag and determining SBR Actions and SBR Action Prices.

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Requirement 2	
Subject to Requirement 1, TC sends notice of BOAs taken for SBR purposes (i.e. not ramping, testing or for constraint purposes) – either as an SBR Flag or via an SBR Notice.	
2.1	Upon accepting an Offer for SBR purposes, the TC will ensure the (SBR) BOA it submits to BMRA (or updates for SAA) is SBR Flagged. The submission of SBR BOAs will be subject to the existing rules for submitting BOAs more generally.
2.2	The SBR Offer will exclude acceptances for ramping, testing or constraint purposes.

Requirement 3
All System Actions derived from an SBR BOA will be called SBR Actions for the purpose of the imbalance price calculation. Any BOAs accepted for ramping, testing or constraint purposes will be tagged out.

Requirement 4
The System Action Price for any SBR Action will be set equal to the VoLL for the purpose of the imbalance price calculation.

Requirement 5
The PO for any accepted Offer Volume derived from an SBR BOA will NOT be repriced equal to VoLL.

Requirement 6
In the absence of confirmation from the BSC Panel per Requirement 1, Requirements 7-15 will also apply.

Requirement 7	
Subject to Requirement 6, TC sends notice to BSCCo of BOAs taken for SBR purposes.	
7.1	Following the acceptance of an Offer for SBR purposes, the TC will send an SBR Notice to BSCCo by email.
7.2	SBR Notices will contain the BOA Number and BM Unit identifier for the relevant SBR BOA(s). The SBR Notice will be defined in BSCP18 as a new P flow.
7.3	The TC will send the SBR Notice to ELEXON no later than noon the next WD of accepting an Offer for SBR purposes. This is so that ELEXON can publish details of the SBR Notice in a timely manner and that imbalance prices can be calculated accurately (i.e. to include SBR) in time for II Run.

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Requirement 8	
Subject to Requirement 6, BSCCo will ensure that imbalance prices produced by the SAA (as part of any Settlement Run) reflect the inclusion of SBR.	
8.1	BSCCo to calculate the imbalance price(s) using its own internal systems.
8.1.1	Using most up to date Bid Offer Data, Acceptance data and BSAD, BSCCo will calculate imbalance price(s) for SBR impacted Settlement Period(s) as though BSCCo had not received an SBR Notice (P^{norm}).
8.1.2	Using SBR Notice, BSCCo identifies SBR BOA(s), corresponding System Action(s) (i.e. SBR Actions) and SBR impacted Settlement Period(s).
8.1.3	BSCCo recalculates imbalance price(s) for SBR impacted Settlement Period(s) setting the price of SBR Actions equal to the SBR Action Price (P^{sbr}).
8.2	BSCCo calculates a revised BPA.
8.2.1	Determine adjustment to original BPA by comparing imbalance prices including and excluding value of SBR, as follows: $$D = P^{sbr} - P^{norm}.$$
8.2.2	Determine revised BPA as follows: $$BPA^{rev} = BPA^{TC} + D$$ Where BPA^{TC} is the up to date BPA reported to the BMRA/SAA/BSCCo by the TC.
8.3	BSCCo sends the TC the revised BPA using new P-flow by email (this will be set out in BSCP18).

Requirement 9	
Subject to Requirement 6, BSCCo will produce an estimate of imbalance price including SBR as soon as reasonably practicable following BMRA indicative price calculation.	
9.1	As soon as reasonably practicable following receipt of an SBR Notice, using the processes pursuant to Requirements 8.1.2 and 8.1.3, BSCCo will produce an estimate of the imbalance price including the value of SBR.
9.2	BSCCo will publish details of this price on the BSC Website and draw attention to the price, e.g. using an ELEXON Circular or Newscast.

Requirement 10	
Subject to Requirement 6, the TC will provide details to BSCCo of any corrections to Bid Offer Data, Acceptance Data or BSAD for SBR impacted Settlement Periods ahead of scheduled Settlement Runs.	
10.1	The TC will send BSCCO details of any corrections to Bid Offer Data, Acceptance Data or BSAD by noon, two Working Days ahead of any given Settlement Run affected by an SBR Action.
10.2	New P-flow to enable communication of data by TC to BSCCo (this will be defined in the BSCP18)

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Requirement 11
Subject to Requirement 6 and 10, the BSCCo will (re)calculate a revised BPA upon receipt from TC of revised Bid Offer Data, Acceptance Data or BSAD for SBR impacted Settlement Periods.

11.1	Upon receipt of revised data pursuant to Requirement 11, BSCCo will re-run Requirement 8 to produce a revised BPA, which it sends to the TC.

Requirement 12
Subject to Requirement 6, TC will send revised BPA to the SAA as part of updated BSAD file

12.1	The TC will include any revised BPA sent to it by BSCCo in a BSAD submission in time for it to be included in the next relevant Settlement Run.

Requirement 13
Subject to Requirement 6, SAA will report any difference between the price it produces and a price expected by BSCCo (i.e. per its calculation of an imbalance price including SBR) for SBR impacted Settlement Periods.

13.1	Following the calculation of an imbalance price including SBR and sending a revised BPA to the TC, BSCCo will send a new SAA interface flow to the SAA containing details of the imbalance price(s) it expects to be calculated for specific Settlement Periods subject to specific Settlement Runs.
13.2	SAA will compare the price(s) its systems produce with the price(s) expected by BSCCo.
13.3	If the SAA price(s) are not equal to the BSCCo price(s) to three decimal places, the SAA will report this to the BSCCo as soon as possible according to existing agreed processes.
13.4	As soon as possible, BSCCo to notify industry of any discrepancy with expected reason(s) and proposed mitigating action (ELEXON Circular).
13.5	The two new SAA interface flows will be defined in the NETA Interface Definition and Design (IDD) Part 2 document.

Requirement 14
Subject to Requirement 6, BSCCo to put in place appropriate controls for ensuring imbalance prices are calculated correctly and actions taken are monitored and recorded for audit purposes.

14.1	ELEXON to retain records, notes and workings with respect to its calculations for determining revised BPAs and generally ensuring that imbalance prices are calculated to correctly reflect the value of SBR.
14.3	ELEXON to report to the BSC Panel, or its delegated authority, on the steps taken to amend the energy imbalance price.

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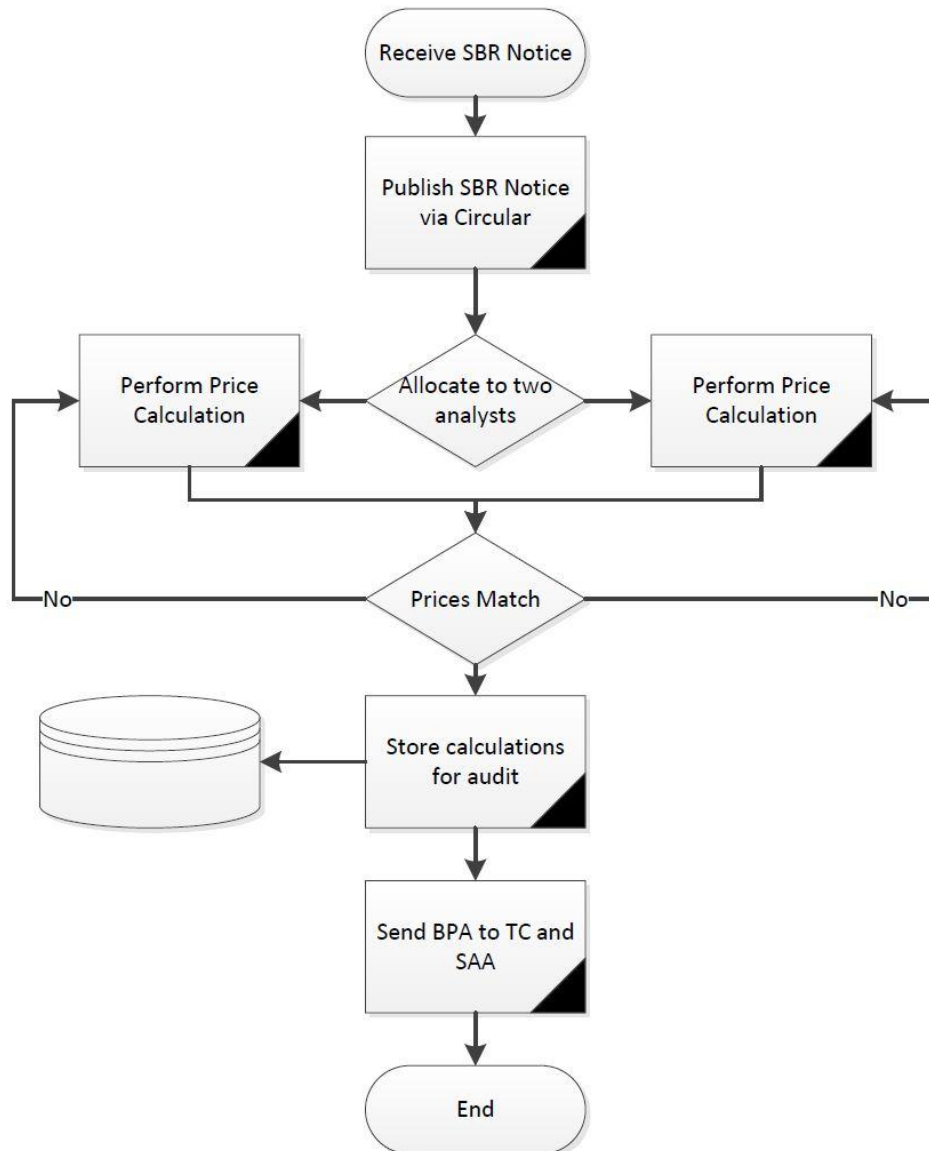| Requirement 15	
Subject to Requirement 6, as soon as reasonably practicable BSCCo will publish details of any actions it takes to ensure imbalance prices accurately reflect the value of SBR.	
15.1	ELEXON will, inter alia, use the BSC Website, ELEXON Portal, Newscast and ELEXON Circulars to publish details of the actions it takes to ensure imbalance prices accurately reflect the value of SBR
15.2	Any notice in 15.1 will contain at least the following details: • SBR impacted Settlement Dates and Settlement Period(s) • P^{norm} • P^{sbr} • BPA^{TC} • D • BPA^{rev}

ELEXON's processes for calculating BPA

For each SBR Impacted Settlement Period, BSCCo will calculate a revised BPA to ensure that Imbalance Prices reflect the value of SBR Actions using the following method. BSCCo will use all available and up to date Bid Offer Data, Acceptance data and BSAD.

- Calculate Energy Imbalance Price (P^{norm}) as though no SBR Notice had been received using BPA^{TC}.

- Calculate Energy Imbalance Price (P^{SBR}) by determining SBR Actions in accordance with SBR Notice and using BPA^{TC}.

- Determine the difference between the imbalance prices calculated including and excluding SBR Action(s): $D = P^{SBR} - P^{norm}$.

- Determine the revised BPA (BPA^{rev}): $BPA^{rev} = BPA^{TC} + D$.

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Process diagram

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4 Impacts and Costs

Estimated central implementation costs of P323

The central implementation costs of P323 are approximately £480, which reflect the costs of the BSC and CSD changes and updating internal process documents. Any ongoing costs will be absorbed due to the expected infrequency of the events.

Indicative industry costs of P323

The expectation is that P323, along with the C16 changes, will have an impact on Trading Parties' risk management and monitoring functions. The implementation of P323 should not require any significant effort from any BSC Party, with any changes to Party systems likely to be marginally incremental to those introduced by P305. There should be no direct impact on Party Agents.

P323 impacts

Impact on BSC Parties and Party Agents	
Party/Party Agent	Potential Impact
Impact on Trading Parties' risk management and monitoring functions due to the increase in price uncertainty and delay in the publication of the price.	

Impact on Transmission Company
The TC will notify ELEXON or the SAA when SBR is dispatched and send revised file to SAA once amendments received from BSCCo.

Impact on BSCCo
ELEXON or the SAA will receive the notification of SBR dispatch and manually process the changes to the imbalance price calculations.

Impact on BSC Systems and processes	
BSC System	Potential Impact
SAA	ELEXON or the SAA will receive the notification of SBR dispatch and manually process the changes to the imbalance price calculations.

Impact on Code	
Code Section	Potential Impact
Section Q and Section T	Changes would be required to implement this Modification.
Section X Annex X-1/X-2	Add definitions

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Impact on Code Subsidiary Documents	
CSD	Potential Impact
BSCP18	Changes will be required to implement this Modification.
NETA IDD Part 2	Changes will be required to capture flows sent between BSCCo and the SAA.
SAA Service Description	Changes will be required to reflect that BSCCo will send details of expected prices for SAA to check as and when SBR dispatched.
SAA User Requirements Specification	

Other Impacts	
Item impacted	Potential Impact
BSAD Methodologies Statement	The changes to the treatment of SBR will be captured via the Transmission Licence: C16 change processes, which will include changes to the BSAD and SMAF methodologies. P323 will need to be consistent with changes made via this process.
SMAF Methodologies Statement	

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Appendix 1: Glossary & References

Acronyms

Acronyms used in this document are listed in the table below.

Acronyms	
Acronym	Definition
BM	Balancing Mechanism
BMRA	Balancing Mechanism Reporting Agent *(BSC Agent)*
BMRS	Balancing Mechanism Reporting Service *(BSC System)*
BOA	Bid-Offer Acceptance
BPA	Buy Price Adjuster
BSAA	Balancing Service Adjustment Action
BSAD	Balancing Services Adjustment Data
BSC	Balancing and Settlement Code *(Industry Code)*
BSCP	Balancing and Settlement Code Procedure *(Code Subsidiary Document)*
BSUoS	Balancing Services Use of System
BVP	Best View Price *(ELEXON's value added service)*
CADL	Continuous Acceptance Duration Limit
CEC	Connection Entry Capacity
CSD	Code Subsidiary Document
DISBSAD	Disaggregated BSAD
DBSR	Demand Side Balancing Reserve
DMAT	De Minimis Acceptance Threshold
ECVAA	Energy Contract Volume Aggregation Agent *(BSC Agent)*
EBSCR	Electricity Balancing Significant Code Review
EMR	Electricity Market Reform
II	Interim Information *(Settlement Run)*
LoLP	Loss of Load Probability
NETA IDD	NETA Interface Definition and Design *(Code Subsidiary Document)*
NISM	Notice of Insufficient System Margin
PAR	Price Average Reference Volume
PO	Offer Price
PVT	Price Verification Tool *(ELEXON's internal system)*
RCRC	Residual Cashflow Reallocation Cashflow
RSP	Reserve Scarcity Price
SAA	Settlement Administration Agent *(BSC Agent)*
SBR	Supplemental Balancing Reserve

Acronyms	
Acronym	Definition
SEL	Stable Export Limit
SMAF	System Management Action Flagging
SO	System Operator
SONAR	System Operator Notification and Reporting System
STOR	Short Term Operating Reserve
TC	Transmission Company
TEC	Transmission Entry Capacity
VoLL	Value of Lost of Load
WD	Working Day

External links

A summary of all hyperlinks used in this document are listed in the table below.

All external documents and URL links listed are correct as of the date of this document.

External Links		
Page(s)	Description	URL
1	P305 page on the ELEXON website	https://www.elexon.co.uk/mod-proposal/p305/
2	P323 page on the ELEXON website	https://www.elexon.co.uk/mod-proposal/p323/
3	BSAD Methodology Statement on the TC website	Bhttp://www2.nationalgrid.com/UK/Industry-information/Electricity-transmission-operational-data/Codes-principles-methodologies/Methodologies/
3	SMAF Methodology Statement on the TC website	http://www2.nationalgrid.com/UK/Industry-information/Electricity-transmission-operational-data/Codes-principles-methodologies/Methodologies/
4	Issue 56 page on the ELEXON website	https://www.elexon.co.uk/smg-issue/issue-56/
4, 5	TC's consultations on the C16 statement amendments	http://www2.nationalgrid.com/UK/Industry-information/Electricity-codes/Balancing-framework/C16-Consultations/
8	P10 page on the ELEXON website	https://www.elexon.co.uk/mod-proposal/p010-eliminating-imbalance-price-spikes-caused-by-truncating-effects/

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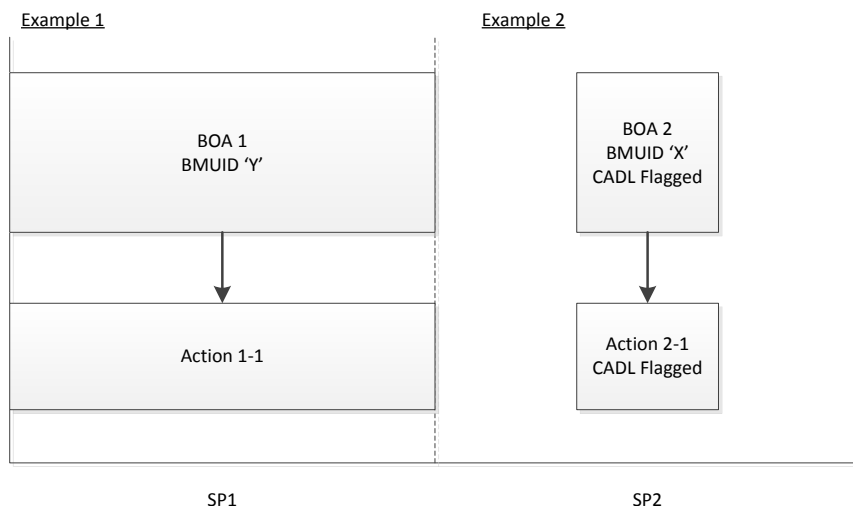22 October 2015

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External Links		
Page(s)	Description	URL
8	P18 page on the ELEXON website	https://www.elexon.co.uk/mod-proposal/p018-removing-mitigating-the-effect-of-system-balancing-actions-in-the-imbalance-price/

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Appendix 2: CADL Flagging examples

The following examples illustrate how BOAs (including SBR BOAs) may be CADL flagged and how, if CADL Flagged, resulting System Actions are treated in the calculation of an imbalance price.

The examples are based on the requirements for calculating Imbalance Prices in Section T and in particular for CADL Flagging in Annex T-1 paragraphs three and 12.

Example 1

Example 2

BOA 1 BMUID 'Y'
Action 1-1

| BOA 2 BMUID 'X' CADL Flagged |
| --- |
| Action 2-1 CADL Flagged |

SP1

SP2

Example 1 Commentary
BOA 1 is provided by BMU ID 'Y' and lasts 30 minutes in SP1 only. Therefore one System Action (Action 1-1) is derived from the BOA.

Because BOA 1 is greater than CADL (15mins) it is **NOT** CADL Flagged. Therefore, any System Actions derived from BOA 1 are also **NOT** CADL Flagged.

Example 2 Commentary
BOA 2 is provided by BMU ID 'X' and lasts 10 minutes in SP2 only. Therefore one System Action (Action 2-1) is derived from the BOA.

Because BOA 2 is less than CADL (15mins) it is CADL Flagged. Furthermore, any System Actions derived from BOA 2 are also CADL Flagged, i.e. Action 2-1.

Example 3

| BOA 3 BMUID 'X' |
| --- |
| Action 3-1 | Action 3-2 |

SP1

SP2
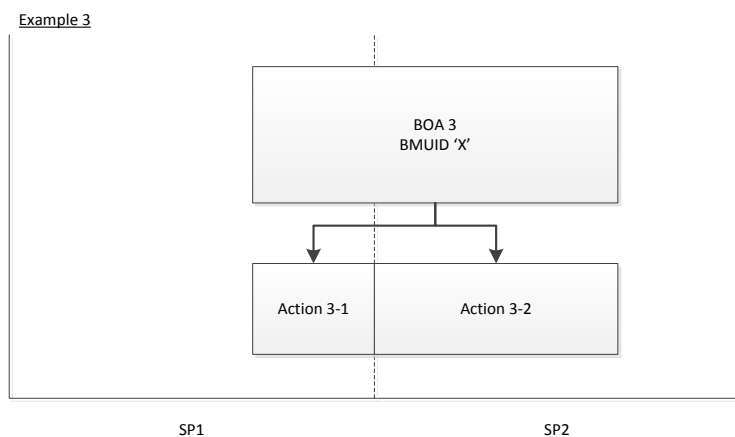
Example 3 Commentary
BOA 3 lasts 30 minutes and is spread across Settlement Periods 1 and 2. Therefore two System Actions can be derived from the BOA – Action 3-1 in SP1 and Action 3-2 in SP2.

Because the BOA is greater than CADL (15mins) it is not CADL Flagged.

Even though Action 3-1 is 10 minutes and therefore less than CADL, it is not CADL flagged because CADL Flagging is determined at BOA level, and filters down to System Actions.

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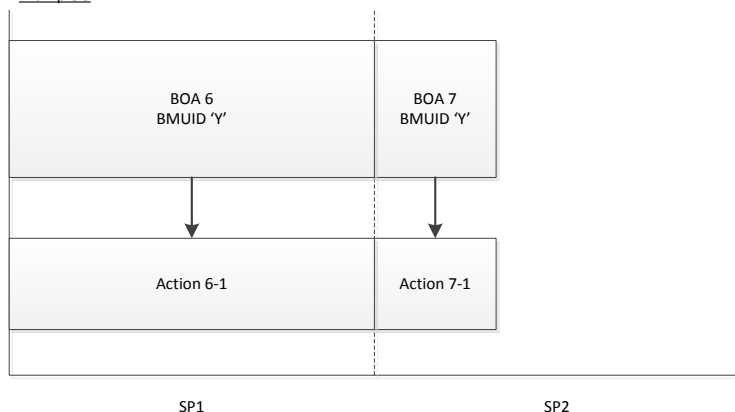Page 20 of 22

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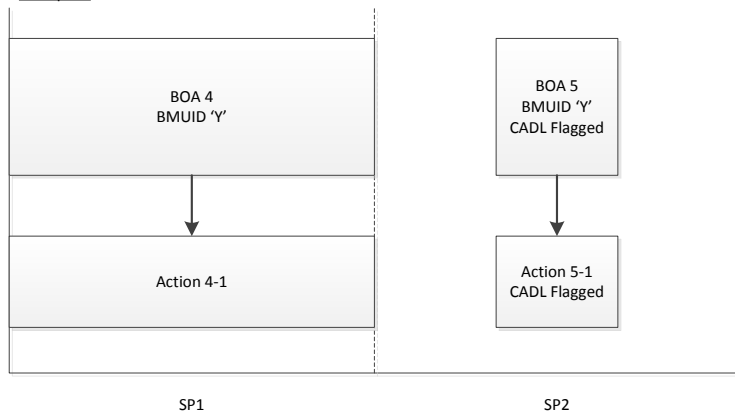
Example 4

Example 4 Commentary
BOA 4 and BOA 5 are 'related' BOAs because both are provided by BMU ID 'Y' and are within three SPs of each other, that is BOA 5 occurs within 1.5 hours of BOA 4..

BOA 4 lasts 30 minutes in SP1 and BOA 5 lasts 10 minutes in SP2. Therefore BOA 4 and Action 4-1 are NOT CADL Flagged but BOA 5 and Action 5-1 are CADL Flagged.

Nb BOA 5 is not considered 'continuous' of BOA 4 because it doesn't start before or at the same time as the end of BOA 4.
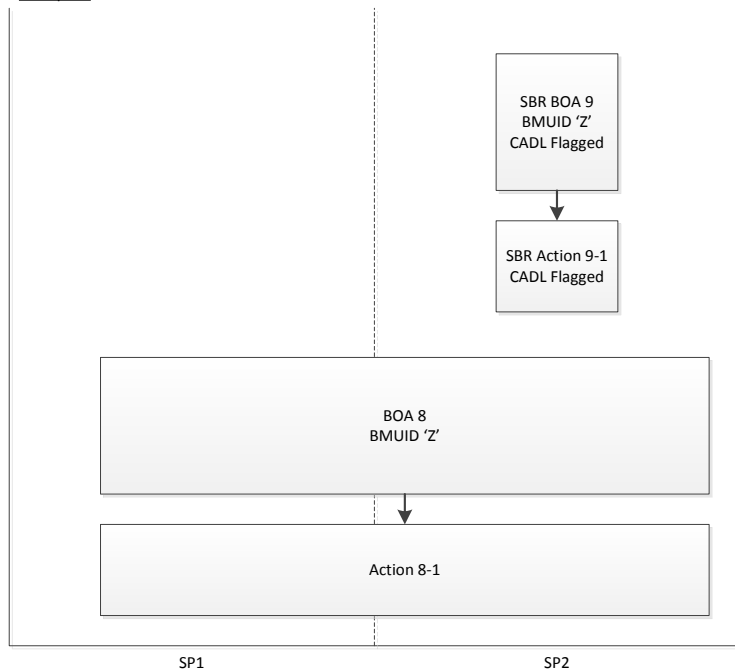

Example 5

Example 5 Commentary
BOA 6 and BOA 7 are 'related' BOAs because both are provided by BMU ID 'Y' and are within three SPs of each other.

BOA 6 lasts 30 minutes in SP1 and BOA7 lasts 10 minutes in SP2.

In this example, BOA 7 is considered to be 'continuous' of BOA 6 because both BOAs are provided by BMU Y and BOA 7 begins as BOA 6 ends. Therefore their durations are combined when determining whether they are CADL Flagged.

This means that whilst BOA 7 only lasts 10 minutes, neither BOAs or the related actions are CADL Flagged.

Example 6

Example 6 Commentary
BMU ID 'Z' is an SBR Provider. BOA 8 is accepted by Grid to take the BMU up to it's Stable Export Limit (SEL). SBR BOA 9 is accepted by Grid to take the BMU above SEL and therefore provide SBR services.

BOA 8 and SBR BOA 9 are 'related' BOAs because both are provided by BMU ID 'Z' and are within three SPs of each other.

BOA 8 lasts 50 minutes across SP1 and SP2, whilst SBR BOA 9 lasts 10 minutes in SP2.

Whilst both BOAs are 'related', in this example, SBR BOA 9 is NOT considered to be 'continuous' of BOA 8 because SBR BOA 9 begins and ends before the beginning and end of BOA 8.

This means that the related BOAs are considered separately against the CADL so that BOA 8 and action 8-1 are NOT CADL flagged and SBR BOA 9 and SBR Action 9-1 are CADL Flagged.

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Example 7

	Initial Stack	Post Classification	Post NIV Tagging and Replacement Price	Post PAR Tagging
	SBR Action 2 100MWh @ £3000/MWh CADL Flagged	SBR Action 2 100MWh @ Unpriced CADL Flagged	SBR Action 2 100MWh @ £150/MWh CADL Flagged	
	Offer A 100MWh @ £150/MWh	Offer A 100MWh @ £150/MWh	Offer A 100MWh @ £150/MWh	
	Offer B 100MWh @ £65/MWh	Offer B 100MWh @ £65/MWh	Offer B 100MWh @ £65/MWh	SBR Action 2 25MWh @ £150/MWh CADL Flagged
	Offer C 100MWh @ £58/MWh	Offer C 100MWh @ £58/MWh	Offer C 100MWh @ £58/MWh	Offer A 25MWh @ £150/MWh

Example 7 Commentary

In this example we illustrate how a combination of SBR and normal System Actions interact in a simplified price stack.

Initial Stack - All actions are ranked from most expensive to least expensive to form an initial price stack.

Classification - Any 'first stage flagged' actions (which includes CADL flagged actions) that are more expensive than the most expensive unflagged action have their prices removed. In this case the SBR Action is CADL Flagged and is more expensive than the most expensive unflagged action (Offer A).

NIV Tagging and Replacement Pricing – in this example there are no Bids to subtract from the Offer Stack as part of NIV Tagging. Therefore all Offers remain and the unpriced SBR Action is repriced using the Replacement Price, which in this case is £150/MWh. The Replacement Price is the volume weighted average of the most expensive 1MWh of unflagged actions.

PAR Tagging – The Price Average Reference from 5 November will be 50MWh. PAR Tagging means that all but the most expensive 50MWh of action(s) are untagged and remain to set the final Imbalance Price. In this example SBR Action 2 and Offer A are the most expensive actions and are both priced at £150/MWh. PAR Tagging leaves a proportionate volume from each of SBR Action 2 and Offer A to achieve the PAR, and 'tags' out the remainder and all other cheaper actions.

The final Imbalance Price is the volume weighted average of the remaining actions, which in this case is £150/MWh.

Example 8

	Initial Stack	Post Classification	Post NIV Tagging and Replacement Price	Post PAR Tagging
	SBR Action 2 100MWh @ £3000/MWh CADL Flagged	SBR Action 2 100MWh @ £3000/MWh CADL Flagged	SBR Action 2 100MWh @ £3000/MWh CADL Flagged	
	SBR Action 1 100MWh @ £3000/MWh	SBR Action 1 100MWh @ £3000/MWh	SBR Action 1 100MWh @ £3000/MWh	
	Offer A 100MWh @ £150/MWh	Offer A 100MWh @ £150/MWh	Offer A 100MWh @ £150/MWh	SBR Action 2 25MWh @ £3000/MWh CADL Flagged
	Offer B 100MWh @ £65/MWh	Offer B 100MWh @ £65/MWh	Offer B 100MWh @ £65/MWh	SBR Action 1 25MWh @ £3000/MWh

Example 8 Commentary

This is another example that illustrates how a combination of SBR and normal System Actions interact in a simplified price stack.

Initial Stack - All actions are ranked from most expensive to least expensive to form an initial price stack.

Classification - Any 'first stage flagged' actions (which includes CADL flagged actions) that are more expensive than the most expensive unflagged action have their prices removed. In this case SBR Action 2 is CADL Flagged and SBR Action 1 is not. Even though SBR Action 2 is CADL Flagged it is the same price as the most expensive unflagged action (SBR Action 1). Therefore SBR Action 2 retains its price.

NIV Tagging and Replacement Pricing – in this example there are no Bids to subtract from the Offer Stack as part of NIV Tagging. Therefore all Offers remain. Furthermore there are no unpriced actions to apply the replacement price to.

PAR Tagging – The Price Average Reference from 5 November will be 50MWh. In this example SBR Actions 1 and 2 are the most expensive actions and are both priced at £3000/MWh. PAR Tagging leaves a proportionate volume from each of SBR Action 1 and 2 to achieve the PAR, and 'tags' out the remainder and all other cheaper actions.

The final Imbalance Price is the volume weighted average of the remaining actions, which in this case is £3000/MWh.

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