

# Balancing Services Adjustment Data Methodology Statement

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National Grid Electricity Transmission Licence

## Version Control

<u>Date</u>	<u>Version No.</u>	<u>Notes</u>
20.3.01	1.0	Initial version
10.4.01	1.1	Revision to include price adjusters for reserve option fees
24.9.01	1.2	Revision to incorporate implementation of P8 and P18 within the BSC. Effective in respect of Settlement Days from and including 25 September 2001
28.3.02	2.0	Revision to incorporate implementation of P48 within the BSC. Effective in respect of Settlement Days from and including 2 April 2002.
25.3.03	2.1	Revision to incorporate implementation of P74/P78 within the BSC. Effective in respect of Settlement Days from and including [Date to be coincident with P74/P78 Implementation]
24.10.03	3.0	Revision to amend the allocation of standing reserve option fees
28.11.03	3.1	Revision to incorporate changes associated with Maximum Generation Service.
01.01.05	3.2	Revisions to incorporate changes relating to BETTA
15.07.05	3.3	Revisions to incorporate changes as a result of CAP076: Treatment of System to Generating Intertripping Schemes
01.11.06	4.0	Revisions to incorporate changes as a result of

<u>Date</u>	<u>Version No.</u>	<u>Notes</u>
		<b>BM Start-Up service</b>
<b>22.01.07</b>	<b>4.1</b>	<b>Revisions to update the Standing Reserve Weighting Factors and to clarify the treatment of Supplemental Standing Reserve in the BPA calculation</b>
<b>01.04.07</b>	<b>4.2</b>	<b>Revisions to incorporate Short Term Operating Reserve (STOR) and to publish STOR weighting factors on National Grid's industry information website</b>
<b>05.11.09</b>	<b>5.0</b>	<b>Revisions to incorporate changes as a result of P217A: Revised Tagging Process and Calculation of Cash Out, Cap144: Emergency Instruction to emergency de-energise, and to incorporate Commercial Intertrip volumes</b>
<b>01.04.11</b>	<b>6.0</b>	<b>Revision following annual review</b>
<b>01.04.13</b>	<b>7.0</b>	<b>Revision following annual review</b>
<b>01.01.14</b>	<b>8.0</b>	<b>Revision to incorporate Demand Side Balancing Reserve and Supplemental Balancing Reserve</b>
<b>01.04.14</b>	<b>9.0</b>	<b>Revision following annual review</b>
<b>01.04.15</b>	<b>10.0</b>	<b>Revision to provide clarification on process to include BM Start-Up in the BPA as part of annual review</b>
<b>05.11.15</b>	<b>11.0</b>	<b>Revisions: to allow Non-BM STOR actions to feed into the cash-out calculation; to remove STOR option fees from the BPA calculation; and to allow SBR and DSBR actions to feed into the cash-out calculation.</b>

<u>Date</u>	<u>Version No.</u>	<u>Notes</u>
05.11.15	12.0	Revision to incorporate treatment of scenario where SBR units have a SEL equal to their MEL
01.04.16	13.0	Revision following annual review
<u>01.04.17</u>	<u>14.0</u>	<u>Revision to remove Demand Side Balancing Reserve</u>

This Statement has been developed in consultation with the Authority. The Statement may only be modified in accordance with the processes set out in Standard Condition C16 of the Transmission Licence. Where we buy, sell or acquire any relevant balancing services of a kind or under a mechanism which is not covered by this Statement then we shall promptly seek to establish a revised Statement covering such balancing services and/or mechanisms in accordance with the relevant provisions of Standard Condition C16 of the Transmission Licence.

In the event that it is necessary to modify this Statement in advance of issuing an updated version of this document, then this will be done by issuing a supplement to this Statement.

The latest version of this document is available, together with the relevant change marked version (if any), electronically from the National Grid Website:

<http://www2.nationalgrid.com/UK/Industry-information/Electricity-codes/Balancing-framework/Transmission-license-C16-statements/>.

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## **PART A: INTRODUCTION**

### **1 Purpose of Document**

This document sets out the Balancing Services Adjustment Data methodology which National Grid Electricity Transmission plc (NGET) is required to establish in accordance with Standard Condition C16 of the Transmission Licence. The purpose of this Statement is to set out the information on relevant balancing services that will be taken into account under the Balancing and Settlement Code for the purposes of determining Imbalance Price(s).

In the event that it is necessary to modify this Statement in advance of issuing an updated version of this document, then this will be done by issuing a supplement to this Statement.

This Statement has been developed in consultation with the Authority. The Statement may only be modified in accordance with the processes set out in Standard Condition C16 of the Transmission Licence. Where we buy, sell or acquire any relevant balancing services of a kind or under a mechanism which is not covered by this Statement, we shall promptly seek to establish a revised Statement covering such balancing services and/or mechanisms in accordance with the relevant provisions of Standard Condition C16 of the Transmission Licence.

The Statement makes reference to a number of definitions contained in the Grid Code and Balancing and Settlement Code. In the event that any of the relevant provisions in the Grid Code or Balancing and Settlement Code are amended it may become necessary for us to modify the Statement in order that it remains consistent with the Grid Code or Balancing and Settlement Code.

In any event, where our statutory obligations or the provisions of the Grid Code are considered inconsistent with any part of this Statement, the relevant statutory obligation and/or Grid Code provision will take precedence.

Unless defined in this Statement, terms used herein shall have the same meanings given to them in the Transmission Licence, the Grid Code and/or the Balancing and Settlement Code as the case may be.



## **PART B: BALANCING SERVICES ADJUSTMENT DATA ('BSAD')**

### **1 The Balancing Service Adjustment Data ('BSAD') variables**

The Balancing Service Adjustment Data ('BSAD') is used as part of the electricity imbalance price calculation specified in section T, paragraphs 4.4 of the Balancing and Settlement Code. Section Q Paragraph 6.3.2 of the Balancing and Settlement Code specifies the BSAD data for each settlement period as:

- (a) The unique sequential number for each Balancing Services Adjustment Actions;
- (b) for each such Balancing Services Adjustment Action;
  - i. the Balancing Services Adjustment Volume;
  - ii. the Balancing Service Adjustment Cost; and
  - iii. Whether the Transmission Company has classified such Balancing Services Adjustment Action as "SO Flagged";
- (c) Buy Price Price Adjustment; and
- (d) Sell Price Price Adjustment.

### **2 Balancing Service Adjustment Actions**

Any relevant balancing service including non-BM Short Term Operating Reserve (STOR) actions, taken outside the Balancing Mechanism, will be provided through BSAD as a Balancing Service Adjustment Action.

For each balancing service provided as a Balancing Service Adjustment Action, the energy bought or sold in MWh and the cost paid for each service in £ will be included. Each Balancing Service Adjustment Action will also be accompanied by an identifier indicating whether the balancing service was used for system management reasons. The System Management Action Flagging methodology statement describes

the process National Grid will use to identify whether Balancing Service Adjustment Actions were used for system management reasons.

~~DSBR actions will feed into the BSAD in post-event re-submission(s). For the avoidance of doubt, volumes and prices of DSBR test actions do not feed into the energy imbalance price calculation.~~

## **2.1 Balancing services included within Balancing Service Adjustment Actions**

Balancing services are defined in the Procurement Guidelines which National Grid is required to establish in accordance with Standard Condition C16 of the Transmission Licence. The purpose of the Procurement Guidelines is to set out the kinds of balancing services which National Grid may be interested in purchasing in the role of System Operator, together with the mechanisms by which National Grid envisages purchasing such balancing services.

Balancing Service Adjustment Actions may include, but are not limited to, the following balancing services:

### **Forward Contracts**

The costs and volumes of the following balancing services will be included as Balancing Service Adjustment Actions:

- energy related products
- pre gate balancing transactions ('PGBTs'); and
- system-to-system services (including services via Interconnectors, Constraint Management & Balancing service and Emergency Assistance service)

All system-to-system services will be included within BSAD as individual Balancing Service Adjustment Actions, except in circumstances where multiple system-to-system actions, initiated by the same party are taken within a particular settlement period on a particular interconnector from a particular service. In such cases, these services will be provided as a single Balancing Service Adjustment Action and consequently, the volume and cost of these services will be aggregated. This reflects the current contractual arrangements.

Below is an example of single aggregated situation. Note that this example is for illustration purposes only.

1. National Grid sells 50MWh in settlement period 10 over the French link at a price of £50/MWh from the Constraint Management & Balancing Service.
2. National Grid later buys 75MWh in settlement period 10 over the French link at a price of £60/MWh from the Constraint Management & Balancing Service.

The output from this example to the Balancing Service Adjustment Actions is as follows;

$$75\text{MWh} - 50\text{MWh} = 25\text{MWh}$$

$$\text{The Balancing Service Adjustment Volume} = 25\text{MWh}$$

$$25\text{MWh} * £60/\text{MWh} = £1500$$

$$\text{The Balancing Service Adjustment Cost} = £1500$$

### **Demand Side Balancing Reserve (DSBR)**

~~All DSBR actions, except those taken for testing the service, will be included as Balancing Service Adjustment Actions. For the avoidance of doubt, the volumes and costs of DSBR actions taken for test purposes do not feed into the energy imbalance price calculation.~~

~~For the purpose of calculating the energy imbalance price, the Balancing Service Adjustment Volume for DSBR will be the aggregated instructed volumes of all DSBR actions within a particular settlement period, multiplied by the prevailing de-rating factor for DSBR. The price~~

~~associated with each DSBR action that will form the Balancing Service Adjustment Cost will be the prevailing Value of Lost Load (VoLL) provided under Section T1.12 of the BSC.~~

### **Supplemental Balancing Reserve (SBR)**

For the avoidance of doubt, SBR volumes and prices will be included in the energy imbalance calculation as Bid-Offer Acceptances (BOAs) in the Balancing Mechanism (BM). It is only in the event that an SBR unit is instructed above its Stable Export Limit (SEL), or in the case where an SBR unit is instructed that has a SEL equal to its MEL, that the BPA is utilised as set out in 3.1.1 below.

### **Maximum Generation**

This service is for a non-firm provision of energy, above generators Maximum Export Level (MEL), called upon after gate closure. Contracts for Maximum Generation are utilisation based only. National Grid will estimate volume and associated cost of the service and will include this estimate in a re-submission of BSAD to the Settlement Administration Agent (SAA) for use in the calculation of the Interim Information Settlement Run. Actual energy delivered, and the associated cost of provision, will not be known until BM Unit Metered Volume ( $QM_{ij}$ ), as defined within the BSC, are available following the Interim Information Run. National Grid will provide final volumes and costs associated with Maximum Generation Services as soon as practicable, but in any case prior to the Initial Settlement Run.

### **Emergency Deenergisation Instructions**

In certain circumstances, it may be necessary for National Grid to take Emergency Deenergisation Instructions. Such actions will be taken in

accordance with Section 5.2 of the CUSC for the purpose of de-synchronising and de-energising Generating Unit(s). The volume for inclusion in BSAD will be calculated as the expected energy delivered up to the 'wall'<sup>1</sup>.

However, as payment for such actions are administered through the CUSC and are consequently not open to the 'pay as bid' approach of the Balancing Mechanism, such actions will be treated as an unpriced.

### **System-to-Generator Operational Intertripping**

System-to-Generator Operational Intertripping service results, in certain circumstances, in the automatic tripping of Generating Unit(s). The contract details associated with a System-to-Generator Operational Intertripping Scheme are contained in section 4.2A of the CUSC and Appendix F3 of a generator's Bilateral Connection Agreement. The volume for inclusion in BSAD will be calculated as the expected energy delivered ( $SE_{sj}$ ) in accordance with the methodology outlined within the ABSVD Methodology Statement, where service S is System-to-Generator Operational Intertripping. The volume for such balancing services will be included within BSAD as Balancing Service Adjustment Actions. However this service is not paid on a £/MWh basis and therefore the volume will be unpriced.

### **Commercial Intertrip**

The commercial intertrip service may, in certain circumstances, result in the automatic tripping of Generating Units(s). The volume for inclusion in BSAD will be calculated as the expected energy delivered up to the wall. However, the energy volume provided through BSAD will be unpriced as the service is not contracted on a £/MWh basis.

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<sup>1</sup> The 'wall' means up to the end of the Balancing Mechanism Window Period

### 3 Price Adjusters

With the exception of STOR services, where National Grid pays option fees to either, facilitate access to MW capacity within the Balancing Mechanism or to facilitate the withdrawal of MW capacity from the Balancing Mechanism, such fees will be represented through the Price Adjusters. Specifically, fees paid to facilitate additional MW capacity will be represented through the Buy Price Adjuster and fees paid to facilitate the withdrawal of MW capacity through the Sell Price Adjuster.

#### 3.1 Buy Price Adjuster (BPA)

The formula below illustrates how the costs associated with such option fees are converted into a £/MWh figure.

$$BPA_j = \frac{(\sum RC_j + \sum FC_j)}{(cR_j + cF_j)} + \sum \frac{BC}{cB}$$

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(The j notation indicates the variable is directly related to the settlement period)

RC<sub>j</sub> = cost of purchases of firm regulating reserve option fees (£)

FC<sub>j</sub> = cost of purchases of Forward Contract option fees (£)

cR<sub>j</sub> = capability of firm regulating reserve contracts for the relevant settlement period (MWh)

cF<sub>j</sub> = capability of Forward contracts for the relevant settlement period (MWh)

BC = cost of BM StartUp instructions to minute t (£)

cB = volume capability of BM StartUp instructions over the defined BPA period to minute t (MWh)

BMStartUp Time = all minutes associated with BM StartUp instruction

For the avoidance of doubt, if the denominator of BPA is zero in any settlement period, then BPA will be set to zero in that period.

### 3.1.1 Balancing services included within the Buy Price Adjuster

The Buy Price Adjuster may include, but is not limited to, the following balancing services:

#### ~~DSBR and~~ Supplemental Balancing Reserve

The ~~set-up fees for Demand Side Balancing Reserve (DSBR) and~~ capability payments for Supplemental Balancing Reserve will not feed into the calculation of BPA.

In the event that SBR units are instructed above SEL (or that an SBR unit with its SEL equal to its MEL is instructed) as a result of system need (i.e. not as part of testing requirements), the BPA will be manually amended retrospectively to enable this volume to be priced at the Value of Lost Load as set out in the Sections Q and T of the BSC and detailed in BSCP18.

#### BM Start-Up

The BM Start-Up service allows National Grid to access energy from BM Units that would not otherwise have run and are unable to start-up within BM timescales on the day. Firm payments for this service are made on a £/h basis, to remunerate the costs of preparing a BMU to start up and synchronise within BM timescales.

The costs incurred in creating additional reserve availability will feed into the calculation of BPA, and will be allocated into the periods where the requirement exists (based on periodically reviewed windows). As National Grid's reserve requirements vary with lead-time, the accrual of costs will need to take account of the amount of reserve that these costs are being incurred to meet, at the relevant lead-time.

For the avoidance of doubt, the costs will not feed into the BPA calculation in circumstances where National Grid uses BM Start-Up services for system management reasons (as defined within the System Management Action Flagging Methodology Statement).

### **Regulating Reserve**

For firm provision of this service National Grid will pay option fees with any utilisation fees being fixed via agreement of BM Offers.

Firm Regulating Reserve option payments for increasing generation or reducing demand will feed into the calculation of the BPA. This will be calculated by dividing the total option fee in any settlement period by the total contracted capability.

Similarly any option payments for reducing generation or increasing demand (negative reserve) will feed into the calculation of the SPA.

### **3.1.2 Worked Example – Buy Price Adjuster**

This example shows how options fees paid by National Grid for balancing services are reflected within the Buy Price Adjuster. This example is illustrative only, for the purposes of demonstrating how BPA is calculated.

The example;

- No firm Regulating Reserve contracts have been purchased  
 $RC_j = \text{£}0$   
 $cR_j = 0\text{MWh}$
- Forward contract option fees purchased  
 $FC_j = \text{£}100$   
 $cF_j = 20\text{MWh}$
- BM Start-Up



BM Start-Up cost = £2000 / hr

Period unit is warmed = 8hrs

BC = £2000 \* 8hrs

BC = £16000

Generator capacity = 250MW

Requirement period = 4hrs

cB = 250MW \* 4hrs

cB = 1000MWh

$$BPA_j = \frac{(\sum RC_j + \sum FC_j)}{(cR_j + cF_j)} + \sum \frac{BC}{cB}$$

$$BPA_j = \frac{(\pounds 0 + \pounds 100)}{(0MWh + 20MWh)} + \sum \frac{\pounds 16000}{1000MWh}$$

$$BPA_j = \pounds 5/MWh + \pounds 16/MWh$$

$$BPA_j = \pounds 21/MWh$$

### **3.2 Sell Price Adjuster (SPA)**

The formula below illustrates how the costs associated with such option fees are converted into a £/MWh figure.

$$SPA_j = \frac{(\sum NC_j + \sum FC_j)}{(cN_j + cF_j)}$$

NC<sub>j</sub> = cost of negative reserve option fees (£)

FC<sub>j</sub> = cost of purchases of Forward Contract option fees (£)

cN<sub>j</sub> = capability of negative reserve (MWh)

cF<sub>j</sub> = capability of Forward contracts (MWh)

For the avoidance of doubt, if the denominator of SPA is zero in any settlement period, then SPA will be set to zero in that period.

#### **3.2.1 Worked Example – Sell Price Adjuster**

This example shows how options fees paid by National Grid for particular balancing services are provided through the Sell Price

Adjuster. This example is illustrative only, for the purposes of demonstrating how SPA is calculated.

The example;

- Forward contracts option fees

Option fees purchased for 15 settlement periods

Total option fees of £3000 to withdraw 150MWh per settlement period

$cF = 150MWh$

Aggregated cost of forward contract option fees per settlement period

= £3000 / 15

= £200

$FC = £200$

$$SPA_j = \frac{(\sum NC_j + \sum FC_j)}{(cN_j + cF_j)}$$

$$SPA_j = \frac{(\pounds 0 + \pounds 200)}{(0MWh + (-150MWh))}$$

$$SPA_j = -\pounds 1.333 / MWh$$

## **PART C: BSAD Submission**

### **1 BSAD Provision**

BSAD will be submitted in accordance with section Q, Paragraph 6.3 of the Balancing and Settlement Code. In outline this entails the submission of BSAD to the Balancing Mechanism Reporting Agent (BMRA) at or before 5pm each day to cover the 24 hour period from half-hour ending 00:30 to half-hour ending 24:00 for the following day. BSAD amendments for previous periods will also be included in the submission.

This initial submission of BSAD to the BMRA will include the Balancing Service Adjustment Actions, BPA and SPA for each settlement period.

The costs and volumes of ~~DSBR actions~~, System-to-System services, Maximum Generation services, Emergency Deenergisation Instructions, System-to-Generator Operational Intertrips and Commercial Intertrips will be included in a post event re-submission(s) of BSAD as described in section 7.

BSAD will also be published on the National Grid Website.

BSAD will also be submitted on a reasonable endeavours basis to the BMRA on a half hourly basis as soon as possible after Gate Closure. In the event that the half hourly data is not available, then the day ahead submission will prevail.

## 2 Basis of BSAD

The calculation of the BSAD will be performed on the following basis:

- Reserve availability will be calculated on the basis of week ahead submissions of availability from service providers;
- If no week ahead submission is received from a service provider then zero availability of that contract will be assumed in the calculation of BPA; and
- Any forward contracts struck prior to the submission of BSAD at 5pm at the day-ahead stage will be included. Best endeavours will be employed to include all the contracts that have been entered into prior to 5pm.

## 3 Re-submission of BSAD

The BSAD will be re-submitted, if required, post event to cover:

- The correction of any errors in the original submission made at 5pm at the Day Ahead stage;
- Adjustments to any of the variables to account for any forward contracts entered into between the day ahead and real time that were not included in the original submission;
- ~~Inclusion of DSBP actions;~~
- Revision of BPA to reflect SBR actions;
- Inclusion of any System-to-System services;
- Inclusion of any Maximum Generation Service volumes and payments;
- Inclusion of any Emergency Deenergisation Instruction volumes; and
- Inclusion of any System-to-Generator Operational Intertripping volumes; and
- Inclusion of any Commercial intertrip volumes.

Any of these circumstances could result in revisions to any of the variables within BSAD and hence SBP and SSP.

If re-submission of BSAD is required, for any of the reasons above, then National Grid will endeavour to do this in sufficient time to allow the revised variables to be included in the calculation of SSP and SBP in the Interim Information Settlement Run.