Balancing and Settlement Code

BSC Service Description for Settlement Administration

Version 27.0

Date: 29 March 2019

AMENDMENT HISTORY

Date	Version	Description of Change	Mods /Panel/ Committee Refs
27/03/01	1.0	Baseline version	NETA Programme
21/08/01	2.0	Incorporated changes for Modification P10	S. Francis
05/09/01	2.4	Issued for Agent review	S. Francis
07/01/02	3.0	Ph–se B – Modifications P8 and P18A	S. Francis
13/08/02	4.0	Release 2 – Modifications P8, P18A (Reporting), P48, P2, CP595, CP598	CVA Programme
10/12/02	5.0	Phase 2A – P61, CP632, CP639, and CP712. Added 'Interim Initial' and 'Interim Information' in section 1.8	A. Bennington
11/03/03	6.0	P78/P104/P71, plus residual changes arising from CP632 and CP712	CVA Programme
24/06/03	7.0	CVA Programme Jun 03 Release (CP735)	CVA Programme
05/11/03	8.0	CVA Programme Nov 03 Release – P82, P107, CP830	CVA Programme
30/06/04	9.0	CVA Programme Jun 04 Release – CP915, CP916 P82 changes removed	CVA Programme
03/11/04	10.0	CVA Programme Nov 04 Release CP974	CVA Programme
23/02/05	11.0	CVA Programme Feb 05 Release CP1091	CVA Programme
02/11/05	12.0	CVA Programme November 05 Release P172	CVA Programme
02/11/06	13.0	BSC Systems November 06 Release P194	Change Implementation
01/12/06	14.0	BSC Systems November 06 Release – P205	Change Implementation
26/06/08	15.0	June 2008 Release – CP1222	Change Implementation
26/02/09	16.0	February 09 Release – CP1255	Change Implementation
5/11/09	17.0	November 09 Release – P217	Change Implementation
25/02/10	18.0	February 10 Release – CP1314	Change Implementation
04/11/10	19.0	November 10 Release – P257	Panel
03/11/11	20.0	November 11 Release – P253	Panel
29/11/12	21.0	November 12 Release – P278	ISG138/10
27/06/13	22.0	June 13 Release – P285	P206/07

Date	Version	Description of Change	Mods /Panel/ Committee Refs
01/08/14	23.0	ORD005	Directed by the Secretary of State
05/11/15	24.0	November 15 Release – P305 November 15 Release – P323	ISG172/04 P245/06
12/04/16	25.0	12 April 2016 – CP1453	ISG178/04
29/06/17	26.0	June 2017 Release – P321 Self-Governance June 17 Release – P350	Panel 245/05 ISG194/02
29/03/19	27.0	29 March 2019 Standalone Release – P369	Panel 285/12
27/06/19	27.1	27 June 2019 Release – P367	TBC

CONTENTS

SCHEDULE 1

BSC OPERATING SERVICES

PART A - SERVICE DESCRIPTION FOR SETTLEMENT

ADMINISTRATION

1.   OVERVIEW

1.1   This is the Service Description for the SAA appointed by BSCCo to provide a settlement service in connection with the BSC.

1.2   The purpose of this Service Description is to describe the responsibilities and obligations of the SAA for the calculation of and provision of reports to the FAA, BSCCo and BSC Trading Parties detailing monies owed and owing as a result of BM actions and the settlement of imbalances. The responsibilities and obligations of the SAA under this Service Description are collectively referred to as 'the SAA Service'.

1.3   The Service Description describes the interfaces between the SAA, and the BSC Trading Party and other BSC Agents. It also implements the relevant provisions as outlined below of Section T (Settlement and Trading Charges) of the Balancing and Settlement Code (Code).

1.4.   The SAA shall:

i)   for each Settlement Day, operate the Interim Initial Settlement Run, Initial Settlement Run, Reconciliation Settlement Runs and Final Reconciliation Settlement Run, and produce BM Reports and Settlement Reports;

ii)   before Initial Settlement:

    a.   receive BM Data from the National Electricity Transmission System Operator (NETSO), which will be sent by the time which is 15 minutes following the end of the Settlement Day, including:

        •   Dynamic Data

        •   Bid-Offer Data

        •   FPN Data

        •   Quiescent PN Data

        •   Bid-Offer Acceptance Data

        •   BM Unit Applicable Balancing Services Volume

        •   MIL / MEL data

    b.   receive Balancing Services Adjustment Data (BSAD) from the NETSO;

    c.   receive Loss of Load Probability and STOR Availability Window data from the NETSO;

    d.   receive Market Index Data from Market Index Data Providers;

    e.   receive BM Unit Metered Volumes from the CDCA;

    f.   receive volume data from the Interconnector Administrators;

    g.   receive the Account Bilateral Contract Volume for each Settlement Period and each Energy Account from the ECVAA;

    h.   receive Metered Volume Reallocation data from the ECVAA;

    i.   receive BM Unit Metered Volume from the SVAA;

    j.   receive BM Unit and Energy Account registration data from the CRA;

    k.   calculate TLMs;

    l.   calculate payments and charges for BM action;

    m.   calculate Energy Imbalance Volumes for each Settlement Period and each Energy Account;

    n.   calculate charges and payments for Energy Imbalances by applying SBP and SSP to Energy Imbalance Volumes;

    o.   calculate Information Imbalance Volumes and charges;

    p.   calculate Non-Delivery Charges;

    q.   calculate the System Operator BM Charges and Residual Cashflow Reallocation Cashflows;

    r.   aggregate charges and payments by BSC Trading Party and charge type, and report to the FAA by 09.00 hours on the relevant Notification Date.

    iii)   for each Emergency Instruction, receive Acceptance Data from the NETSO and take the appropriate actions, as authorised by BSCCo

    iv)   for each Demand Control event, receive notice of such event from the BMRA or the NETSO.

[P367]~~v)   in order that the value of SBR Actions are correctly reflected in imbalance prices, compare the system calculated imbalance prices with prices that BSCCo will provide.~~

1.5.   The terms, definitions and abbreviations used in this Service Description shall have the meanings given in the Glossary and Part A of this Agreement.

1.6.   The SAA shall meet the performance standards that are required to be achieved in the delivery of this service as detailed in Part G of Schedule 1 of this Agreement.

1.7   The SAA shall make its systems and processes available such that the provided services are completed within the timescales required by BSC Trading Parties to meet their obligations under the BSC and adhere to the published Settlement Calendar.

1.8   The BSC sometimes uses different terms and acronyms that have the same meaning as those used in this document. The following table indicates which terms and acronyms have equivalent meaning

Service Description Term/acronym	BSC equivalent term/acronym
Deemed Metered Amounts	Metered Volumes
$TLMO_j^+$	$TLMO_j^+$
$TLMO_j^-$	$TLMO_j^-$
Interim Initial	Interim Information

2.   RECEIVE INPUT DATA

2.1   National Electricity Transmission System Operator (NETSO)

The SAA shall receive Balancing Services Adjustment Data. BM Data and Loss of Load Probability Data from the NETSO.

2.1.1   BM Data will cover, for each BM Unit:

- Final Physical Notification FPN Data

- Quiescent Physical Notification Data

- Bid Offer Data

- Bid Offer Acceptance Data

- MIL / MEL Data

- Any Dynamic Data received by the NETSO during the Settlement Day

2.1.2   The SAA shall receive BM Unit Applicable Balancing Services Volume Data no later than the second Business Day after the Settlement Day and shall:

- be expressed in MWh;

- follow the sign conventions set out in paragraph 2.4 of Annex X-2; and

- represent an aggregate net volume of Active Energy for the whole Settlement Period.

2.1.3   Balancing Services Adjustment Data will consist of:

For Settlement Days after, and including, the P194 effective date up to the P217 effective date:

- Buy-Price Cost Adjustment (Energy) ($EBCA_j$)

- Buy-Price Volume Adjustment (Energy) ($EBVA_j$)

- Buy-Price Volume Adjustment (System) ($SBVA_j$)

- Sell-Price Cost Adjustment (Energy) ($ESCA_j$)

- Sell-Price Volume Adjustment (Energy) ($ESVA_j$)

- Sell-Price Volume Adjustment (System) ($SSVA_j$)

- Buy-Price Price Adjustment (BPA_j)

- Sell-Price Price Adjustment (SPA_j)

For Settlement Days after, and including, the P217 effective date:

NETBSAD:

- Buy-Price Cost Adjustment (Energy) ($EBCA_j$) – submitted as zero

- Buy-Price Volume Adjustment (Energy) ($EBVA_j$) – submitted as zero

- Buy-Price Volume Adjustment (System) ($SBVA_j$) – submitted as zero

- Sell-Price Cost Adjustment (Energy) ($ESCA_j$) – submitted as zero

- Sell-Price Volume Adjustment (Energy) ($ESVA_j$) – submitted as zero

- Sell-Price Volume Adjustment (System) ($SSVA_j$) – submitted as zero

- Buy-Price Price Adjustment (BPA_j)

- Sell-Price Price Adjustment (SPA_j)

DISBSAD:

- A number of Balancing Services Adjustment Actions. For each action:

  o   Settlement Day

  o   Settlement Period

  o   ID

  o   Cost (£)

  o   Volume (MWh)

  o   SO-Flag (T/F)

  o   STOR Provider Flag (T/F)

2.1.4   In respect of each Settlement Period within a Settlement Day, the SAA shall receive:

a)   (in relation to all such Settlement periods) not later than 17:00 hours on the preceding day, the NETSO's estimate (at the relevant time of sending) of Balancing Services Adjustment Data, as described in section 2.1.2.

b)   (in relation to each such Settlement Period) after Gate Closure for, and not later than the end of such Settlement Period, the NETSO's estimate (at the relevant time of sending) of Balancing Services Adjustment Data, as described in section 2.1.2.

c)   On the day next following such Settlement Day, the Balancing Services Adjustment Data, as described in section 2.1.2.

d)   No later than 15 minutes following Gate Closure, the Loss of Load Probability Data

2.1.4A   Loss of Load Probability Data will consist of, for each Settlement Period:

- Loss of Load Probability (LOLP$_j$)

- De-rated Margin, in MWh

2.1.5   The SAA may receive resubmitted Balancing Services Adjustment Data or Loss of Load Probability Data, from the NETSO, in respect of any Settlement Period within a Settlement Day, at any time prior to the Final Reconciliation Settlement Run for such Settlement Day and the SAA shall correct such data in the Settlement Run next following any such resubmission.

2.1.6   No later than 15 minutes after the start and end of a Demand Control Event, and subsequently in case of update, the SAA shall receive Demand Control Event details from the BMRA or the NETSO. This information shall include:

- A unique identifier for that Demand Control Instruction

- Stage number

- Event type

- Event start date and time

- Event end date and time

- Instructed Distribution System Operator

- Demand Control Event Estimate in MW

- System Management Action Flag

2.1.A   Market Index Data Providers

2.1.A.1   For each Settlement Day, the SAA shall receive, validate and store Market Index Data provided by each Market Index Data Provider comprising of:

a.   a Market Index Volume expressed in MWh for each Settlement Period for each Settlement Day; and

b.   a Market Index Price expressed in £/MWh for each Settlement Period for each Settlement Day.

2.1.A.2   The SAA shall perform the following validation checks:

a.   in respect of a Settlement Period that Market Index Data has been submitted by a valid Market Index Data Provider using data maintained by the CRA;

b.   in respect of a Settlement Period and Market Index Data Provider the Individual Liquidity Threshold does not exceed the Market Index Volume (excluding where the Market Index Volume is supplied as zero);

2.1.A.3   If in respect of a Settlement Period and a Market Index Data Provider:

a.   the Individual Liquidity Threshold exceeds the Market Index Volume (excluding where the Market Index Volume is supplied as zero); or

b.   a Market Index Data Provider fails for whatever reason to submit Market Index Data in time for it to be used in the Settlement Calculations,

the SAA shall default the Market Index Price and Market Index Volume to zero for that Settlement Period.

2.1.4A.4   For the purposes of Performance Reporting, the SAA shall for each Market Index Data Provider:

   a.   record the number of Settlement Periods where the SAA has defaulted Market Index Data to zero for the reason described in 2.1.4A.3.a;

   b.   record the number of Settlement Days where the MIDP has failed to provide Market Index Data (for the purposes of the II Settlement Run) for the reason described in 2.1.4A.3.b;.

   c.   record the number of Settlement Periods where the Market Index Data with zero values has been used in Settlement calculations, for whatever reason (including, for the avoidance of doubt, instances where the Market Index Data Provider has provided zero values).

2.2   CDCA

2.2.1   The SAA shall receive the following data from the CDCA:

- BM Unit Metered Volumes, including any Demand Disconnection Volumes;

- GSP Group Take;

- Interconnector Metered Volumes.

2.3   ECVAA

2.3.1   The SAA shall receive from the ECVAA, by the end of the Business Day following the Settlement Day, an initial set of validated Metered Volume Reallocations for BSC Trading Parties and the NETSO and associated BM Units.

2.3.2   The SAA shall receive Account Bilateral Contract Volume for each Settlement Period and each Energy Account from the ECVAA.

2.4   IA

2.4.1   The SAA shall receive from the Interconnector Administrators, by the end of the Business Day following the Settlement Day, for each Interconnector with a Transmission System which is not part of the Total System, Deemed Metered Amounts for the BM Unit of each Interconnector User of the relevant Interconnector.

2.4.2   If any expected BM Unit Metered Volumes from an Interconnector Administrator are missing, the SAA shall ask the Interconnector Administrator to resubmit the data. In the event that the metered volumes are still not received, the SAA shall contact BSCCo for further advice and carry out the actions directed by BSCCo to resolve the problem.

2.4.2A   If any BM Unit Metered Volumes are received after the Interim Information Settlement Run, the SAA shall contact BSCCo for further advice and carry out the actions directed by BSCCo. The SAA shall not load these files unless instructed to by BSCCo.

2.4.3 If, in relation to an Interconnector, for any reason:

(a) the Party for the time being appointed as Interconnector Administrator ceases to be a Party, or

(b) otherwise at any time there is no Party so appointed, or

(c) the Interconnector Administrator is in Default (as defined in Section H3.1), or

(d) the Interconnected NETSO becomes the Interconnector Error Administrator pursuant to paragraph 5.4.5,

The BM Unit Metered Volumes for the Interconnector BM Units of any relevant Interconnector User shall be set to zero by the SAA (and, accordingly, the Interconnector Metered Volume shall be attributed to the relevant Interconnector BM Unit of the Interconnector Error Administrator in accordance with Section T4.1) until and unless a replacement Interconnector Administrator or Interconnector Error Administrator (as the case may be) is appointed and registered in accordance with the provisions of paragraph 5.4.3 or (as the case may be) the Interconnector Administrator ceases to be in Default.

2.4.4 BSCCo shall notify the SAA if and when any of the circumstances described in paragraph 2.4.2 occur.

2.5 SVAA

2.5.1 The SAA shall receive BM Unit Metered Volumes from the SVAA, including any Demand Disconnection Volumes. The SAA will validate data received from SVAA.

2.5.2 The SAA shall receive Corrected Component volumes from the SVAA. The SAA will validate data received from the SVAA.

2.6 BSCCo

2.6.1 The SAA shall receive a De Minimis Acceptance Threshold ($DMAT_d$) for use in calculating imbalance prices. The value of this threshold will be set and from time to time amended by BSCCo, who will also decide upon its effective date. This date shall not be less than 20 Business Days after BSCCo's initial decision to revise the threshold value.

Initially, the De Minimis Acceptance Threshold will be set at 1MWh.

2.6.2 The SAA shall receive a $CADL_d$ (Continuous Acceptance Duration Limit) value from BSCCo for use in the processing of Bid-Offer Volumes. This value may be revised by BSCCo from time to time (subject to consultation with BSC Parties and the NETSO) and can range between 0 and 30 minutes, but will initially be set at 15 minutes. Any revised $CADL_d$ value shall become effective from a Settlement Day determined by BSCCo.

2.6.3 The SAA shall receive (from BSCCo), validate and store Individual Liquidity Thresholds for each Market Index Data Provider registered with CRA.

2.6.4   The PAR_d parameter will be a MWh volume with a value of 500MWh. This value may only be changed by an Approved Modification Proposal. Any revised value shall become effective from a Settlement Day defined by the Approved Modification Proposal and will be communicated to the SAA by the BSCCo.

2.6.5   The $RPAR_d$ parameter will be a MWh volume with a value of 100MWh. This value may only be changed by an Approved Modification Proposal. Any revised value shall become effective from a Settlement Day defined by the Approved Modification Proposal and will be communicated to the SAA by the BSCCo.

2.6.6   Each year during January (and after publication of the Settlement Calendar) the SAA shall receive from the BSCCo a draft 'Post Final Settlement Calendar' for review.

2.6.7   The SAA shall, when instructed by BSCCo to resolve a Manifest Error:

- amend the Offer Price and Bid Price of Bid-Offer Pair(s) where such have been identified as Error Bid-Offer Pair(s); and

- inform BSCCo when this has been done.

2.6.8   The SAA shall receive an Arbitrage Flag for use in determining whether bids and offers should be removed through the arbitrage process. Initially, the Arbitrage Flag will be set to true.

2.6.9   The SAA shall receive a Value of Lost Load (VoLL) parameter for use in calculating imbalance prices. This value will only be changed following a formal VoLL Review process established in BSCP40. Any revised values shall be communicated to the SAA by the BSCCo. The initial value of VoLL shall be £3000/MWh, rising to £6000/MWh on 1 November 2018.

~~[P367]2.6.10   The SAA shall receive from BSCCo Energy Imbalance Price(s) expected to reflect the value of the SBR Action(s) taken, for comparison with the SBP produced for the relevant Settlement Period(s).~~

2.7   CRA

2.7.1   The SAA shall receive BM Unit and Energy Account registration data from the CRA to allow BM Unit to Trading Unit mapping.

2.7.2   The SAA shall receive Market Index Data Provider registration data from the CRA for validating Market Index Data described in 2.1A.2.

2.7.3   The SAA shall receive TLF data and the proportion of losses to be allocated to BM Units in delivering Trading Units, from the CRA. . The proportion of losses to be allocated to BM Units in delivering Trading Units will be set to 0.45.

2.8   FAA

2.8.1   The SAA shall receive from the FAA, on an annual basis, a copy of the Payment Calendar developed (in consultation with the SAA) and published by the FAA. Using the Payment Calendar the SAA shall create a Settlement Calendar. This process is described in more detail at section 5.2.

2.8.2 The SAA shall, upon receipt of notification of an invalid Debit/Credit report from the FAA, use its best endeavours to resolve the problem and issue a revised SAA Debit/Credit report to the FAA.

2.9 Data Receipt and Validation

2.9.1 Section 6 describes the operation of the SAA service with respect to the use of default data where the scheduled input data is missing or invalid.

3. PERFORM SETTLEMENT CALCULATIONS

3.1 Determination of the Transmission Loss Multipliers

3.1.1 *Delivering and Offtaking Trading Units*

For the purpose of scaling for Transmission Losses, in respect of each Settlement Period, a Trading Unit will be identified as either 'delivering' to the Total System or 'offtaking' from the Total System in respect of any Settlement Period. This is determined by aggregating the BM Unit Metered Volumes from each BM Unit in the Trading Unit to determine whether the Trading Unit was a net importer or net exporter.

A Trading Unit is a "delivering" Trading Unit when $\Sigma_i QM_{ij} \geq 0$ and

A Trading Unit is an "offtaking" Trading Unit when $\Sigma_i QM_{ij} < 0$

Where Σ_i represents the sum over all BM Units belonging to that Trading Unit.

Note that, by default, a BM Unit not comprising a Trading Unit with other BM Units shall be considered to be a 'Sole Trading Unit' for the purposes of these calculations. The "delivering" and "offtaking" status of such a Trading Unit shall therefore be determined using the Metered Volume of the single BM Unit comprising that Trading Unit.

3.1.2 In any Settlement Period in which a Trading Unit is offtaking or delivering, all BM Unit Metered Volumes associated with that Trading Unit will be scaled by a TLM that allocates a pro-rata of the volume of losses in that Settlement Period. TLMs will be calculated in accordance with the following formulae:

$$TLM_{ij} = 1 + TLF_{ij} + TLMO^+_j$$

for all non-Interconnector BM Units that are in Trading Units that are net deliverers of energy in Settlement Period j, and

$$TLM_{ij} = 1 + TLF_{ij} + TLMO^-_j$$

for all non-Interconnector BM Units that are in Trading Units that are net offtakers of energy in Settlement Period j.

Where:

$$TLMO^+_j = - \{\alpha(\Sigma^+ QM_{ij} + \Sigma^- QM_{ij}) + \Sigma^+_{(non-I)} (QM_{ij} * TLF_{ij})\} / \Sigma^+_{(non-I)} QM_{ij} ;$$

$$TLMO^-_j = \{(\alpha-1)(\Sigma^+ QM_{ij} + \Sigma^- QM_{ij}) - \Sigma^-_{(non\text{-}I)} (QM_{ij} * TLF_{ij})\} / \Sigma^-_{(non\text{-}I)} QM_{ij} \; ;$$

Σ^+ represents a sum over all BM Units in Trading Units that are net deliverers of energy in Settlement Period j;

Σ^- represents a sum over all BM Units in Trading Units that are net offtakers of energy in Settlement Period j;

$\Sigma^+_{(non\text{-}I)}$ represents the sum over all BM Units other than Interconnector BM Units belonging to Trading Units that are delivering Trading Units in the Settlement Period; and

$\Sigma^-_{(non\text{-}I)}$ represents the sum over all BM Units other than Interconnector BM Units belonging to Trading Units that are offtaking Trading Units in the Settlement Period.

3.1.3   In respect of each Settlement Period, for each Interconnector BM Unit, the Transmission Loss Multiplier shall be set as follows:

$$TLM_{ij} = 1$$

irrespective of whether the Interconnector BM Unit belongs to a delivering or offtaking Trading Unit in the Settlement Period.

3.1.4   The values of TLF_{ij} will be as determined in accordance with Section T, Annex T-2 of the Code.

3.1A   Determination of TLM-Adjusted BM Unit Gross Demand (for CFD purposes)

In order to support a CFD Arrangements the SAA will, for each VAR, calculate and provide to the CFD Settlement Services Provider the gross demand ('**the TLM-Adjusted BM Unit Gross Demand**') for each relevant BM Unit and Settlement Period in the Settlement Day. For Supplier BM Units the TLM-Adjusted BM Unit Gross Demand is defined as:

TLM-Adjusted BM Unit Gross Demand $= - TLM_{ij} *$ BM Unit SVA Gross Demand

where BM Unit SVA Gross Demand is the value received from the SVAA for that BM Unit and Settlement Period.

For BM Units (other than Supplier BM Units and Interconnector BM Units) which have a BM Unit Metered Volume less than zero in a given Settlement Period the TLM-Adjusted BM Unit Gross Demand is defined as:

TLM-Adjusted BM Unit Gross Demand $= TLM_{ij} *$ BM Unit Metered Volume

For all other BM Units, TLM-Adjusted BM Unit Gross Demand is not defined (and the SAA will not provide a value for that BM Unit and Settlement Period to a CFD Settlement Services Provider).

3.2   Settlement of BM Actions

Introduction

3.2.1   BM actions are remunerated on a "pay-as-bid" basis. BSC Trading Parties from whom the NETSO has accepted a BM action in a particular period will be subject to payments and/or charges for such action. Such payments and charges are calculated for each BM Unit for each Settlement Period and for each Bid-Offer Acceptance. Data conversion will be undertaken on BM Unit data received from the NETSO as described in Section T 3.1.1 of the Code.

Treatment of Time

3.2.2   Bid-Offer Data, Point FPNs, and Bid-Offer Acceptance Data contain information in the form of spot MW data that will be used to determine half-hourly MWh energy quantities. The following algebra is used to specify the relationship between this input data and a number of derived outputs. It includes the 'calculation' of interim variables that are continuous functions of time.

3.2.3   Whilst all half-hourly integrated MWh energy quantities should be explicitly calculated as part of the settlement process, it is not intended that these continuous functions of time should actually be calculated or reported. The variables to which this applies are as follows:

- Final Physical Notification ($FPN_{ij}(t)$)

- Bid-Offer Volume ($qBO^n_{ij}(t)$)

- Bid-Offer Upper Range ($BOUR^n_{ij}(t)$)

- Bid-Offer Lower Range ($BOLR^n_{ij}(t)$)

- Acceptance Volume ($qA^k_{ij}(t)$)

- Accepted Bid-Offer Volume ($qABO^{kn}_{ij}(t)$)

- Accepted Offer Volume ($qAO^{kn}_{ij}(t)$)

- Accepted Bid Volume ($qAB^{kn}_{ij}(t)$)

Conversion of all such data received from the NETSO shall be in accordance with Section T 3.1.2 of the Code.

3.2.4   In each Bid-Offer Acceptance, the NETSO indicates the MW output levels at which it wishes the BM Unit to operate for certain times within the BM Window Period. Each Bid-Offer Acceptance comprises a set of Point Acceptance Volumes. Linear interpolation is used to define the profile of power output expected to be delivered in each Settlement Period within the BM Window Period as a result of Bid-Offer Acceptance, k.

3.2.5 The values of power output defined in this manner that fall within a particular Settlement Period j are termed the Acceptance Volumes $qA^k_{ij}(t)$. These are ordered by reference to increasing values of k.

3.2.6 The difference between successive Acceptance Volumes represents the volume (in MW) of Offer or Bid accepted by the NETSO at each spot time as a result of that particular Acceptance Volume. If, at any time, the Acceptance Volume increases relative to the previous Acceptance Volume (or FPN initially), then Offers have been accepted at that spot time. If the Acceptance Volume decreases relative to the previous Acceptance Volume, (or FPN initially), then Bids have been accepted.

3.2.7 In assessing the increase or decrease in production or consumption at any given time, the absolute level of the increase or decrease is also important as this dictates which Bid or Offer has been accepted.

3.2.8 Once the volumes attributable to each Bid and Offer for each spot time in a Settlement Period have been calculated, they are integrated over the spot times in the Settlement Period to determine the overall MWh volume. This MWh volume is then multiplied by the appropriate Bid or Offer price and adjusted for Transmission Losses in order to determine the BM Cashflow. All calculations shall be in accordance with Sections T 3.6 to 3.11 of the Code (these Sections are repeated in this SD).

3.3 Calculation of Final Physical Notification

3.3.1 The SAA shall calculate FPNs by ensuring that the value of $FPN_{ij}(t)$ is calculated for spot times, t, falling within Settlement Period j by linear interpolation from the values of Point FPN ($^fFPN_{it}$), submitted for that Settlement Period j.

3.3.2 If, for a particular time t no value of Point FPN exists within the Settlement Period for which the associated time is at or after time t, the value of the $FPN_{ij}(t)$ shall be equal to the value of the Point FPN submitted for the spot time most recently preceding time t and, where more than one Point FPN exists for that spot time, the Point FPN with the higher value of the Point Value Identification Number f.

If no value of Point FPN exists for which the associated time is at or before a particular time, the value of $FPN_{ij}(t)$ shall be set equal to zero.

3.4 Calculation of Bid-Offer Volume

3.4.1 The SAA shall calculate Bid-Offer Volumes by ensuring that for any value of Bid-Offer Number, n, the Bid-Offer Volume ($qBO^n_{ij}(t)$) at any spot time t is calculated by linear interpolation from the values of Point Bid-Offer Volume ($^fqBO^n_{it}$) submitted for spot times t in Settlement Period j.

3.4.2 If, for a particular time, t, no subsequent value of Point Bid-Offer Volume has been submitted within the Settlement Period, then the SAA shall set the value of Bid-Offer Volume at the value of the Point Bid-Offer Volume submitted for the time most recently prior to the time in question, and this value shall apply until the end of the Settlement Period.

3.5 Calculation of Acceptance Volume

3.5.1 The SAA shall calculate Acceptance Volumes by ensuring that the Acceptance Volume ($qA^k_{ij}(t)$) is determined for spot times, t, within each Settlement Period, j, that falls within the BM Window Period (as defined at the Bid-Offer Acceptance Time T^k_{it}). Such calculations shall be in accordance with Section T 3.4.1 of the Code.

3.5.2 It is calculated by linear interpolation from the Point Acceptance Volumes qA^k_{it} issued by the NETSO for that Bid-Offer Acceptance, k.

3.5.3 For spot times within the BM Window Period prior to the first value Point Acceptance Volume for Bid-Offer Acceptance k, the value of the Acceptance Volume is set to the last calculated value of Acceptance Volume for those spot times. If no such previously calculated value of Acceptance Volume exists, then the SAA shall set the Acceptance Volume to the value of $FPN_{ij}(t)$ for those times.

3.5.4 For spot times which are both:

(a) within the Balancing Mechanism Window Period; and

(b) after the last time associated with a value of Point Acceptance Volume for the Acceptance,

for each BM Unit, the value of the Acceptance Volume shall be set to the last calculated value of Acceptance Volume for those spot times. If no such previously calculated value of Acceptance Volume exists, then the Acceptance Volume shall be set to the value of $FPN_{ij}(t)$ for those spot times.

3.6 Processing of Bid-Offer Data

3.6.1 Before determining what volume of each Offer and Bid is deemed to have been accepted as a result of each Acceptance Volume, the SAA shall process the Bid-Offer Data for each Settlement Period. This involves calculating the Bid-Offer Upper Range for Bids and Offers that cover volumes of output above FPN, and calculating the Bid-Offer Lower Range for Bids and Offers that cover output below FPN.

3.7 Calculation of Bid-Offer Upper Range[1]

3.7.1 The SAA shall calculate the Bid-Offer Upper Range by ensuring that for Bid-Offer Pairs for which the associated Bid-Offer Pair Number $n \geq 1$, the Bid-Offer Upper Range $BOUR^n_{ij}(t)$ is calculated for all spot times in Settlement Period j as:

$$BOUR^n_{ij}(t) = FPN_{ij}(t) + \Sigma^{n+}qBO^n_{ij}(t); \text{ and}$$

$$BOUR^0_{ij}(t) = FPN_{ij}(t)$$

Where Σ^{n+} represents a sum over the range of Bid-Offer Pair Numbers 1 to n.

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[1] For further detail on the establishment of Bid-Offer Upper Range and Bid-Offer Lower Range in relation to FPN see BSC Section T3.4A. For further detail on the establishment of Bid-Offer Upper Range and Bid-Offer Lower Range in relation to Unsubmitted Bid-Offer Pairs see BSC Section T3.5.

3.8 Calculation of Bid-Offer Lower Range

3.8.1 The SAA shall calculate the Bid-Offer Lower Range by ensuring that for Bid-Offer Pairs for which the associated Bid-Offer Pair Number n<0, the Bid-Offer Lower Range $BOLR^n_{ij}(t)$ is calculated for all spot times in Settlement Period j as:

$$BOLR^n_{ij}(t) = FPN_{ij}(t) + \Sigma^{n-} qBO^n_{ij}(t)$$

$$BOLR^0_{ij}(t) = FPN_{ij}(t)$$

Where Σ^{n-} is the sum over all negative Bid-Offer Pairs, -1 to n.

3.9 Calculation of Accepted Bid-Offer Volume

3.9.1 The SAA shall calculate the Accepted Bid-Offer Volume by ensuring that the Accepted Bid-Offer Volume ($qABO^{kn}_{ij}(t)$) represents the volume (in MWh) of Bid or Offer from Bid-Offer Pair n accepted as a result of Bid-Offer Acceptance k in Settlement Period j from BM Unit i. It is determined as follows:

For all n>0,

$$qABO^{kn}_{ij}(t) = max(min(qA^k_{ij}(t) , BOUR^n_{ij}(t)) , BOUR^{n-1}_{ij}(t))$$
$$- max(min(qA^{k-1}_{ij}(t), BOUR^n_{ij}(t)) , BOUR^{n-1}_{ij}(t))$$

For all n<0,

$$qABO^{kn}_{ij}(t) = min(max(qA^k_{ij}(t) , BOLR^n_{ij}(t)) , BOLR^{n+1}_{ij}(t))$$

$$min(max(qA^{k-1}_{ij}(t), BOLR^n_{ij}(t)) , BOLR^{n+1}_{ij}(t)).$$

3.9.2 Where, from all Bid-Offer Acceptances for which an Acceptance Volume has been determined for Settlement Period j, k-1 represents that Bid-Offer Acceptance with the Bid-Offer Acceptance Time (T^{k-1}_{it}) most recently preceding that of Bid-Offer Acceptance k. For the purposes of this Service Description the superscript "k-1" used in the terms above is equivalent to superscript "k-" as used in the Code.

3.9.3 The SAA shall ensure that, if there is no Bid-Offer Acceptance, for which an Acceptance Volume has been determined in Settlement Period j which has a Bid-Offer Acceptance Time that precedes that of Bid-Offer Acceptance k, the value of $qA^{k-1}_{ij}(t) = FPN_{ij}(t)$.

For the purposes of this Service Description the superscript "k-1" used in the term above is equivalent to superscript "k-" as used in the Code.

3.10 Continuous Acceptances and CADL$_d$ (for Settlement Days on or after the P194 effective date until the P217 effective date)[2]

3.10.1 The SAA shall carry out the following procedure in order to flag certain short-duration Accepted Bid-Offer Volumes and exclude them from the calculation of energy imbalance prices:

a. The SAA shall examine Bid-Offer Acceptances and determine whether any are continuous. For an Acceptance k that commences in Settlement Period j and relates to BM Unit i, an Acceptance continuous with k is one that relates to the same BM Unit, and overlaps k (or an Acceptance already continuous with k) for at least one spot time.

b. The SAA shall then determine the Continuous Acceptance Duration, CAD^k_i of Acceptance k. This is defined as the time period between

    i. the earliest spot time corresponding to a Point Acceptance Volume for: Acceptance k or an Acceptance continuous with k, whichever is earlier, and

    ii. the latest spot time corresponding to a Point Acceptance Volume for: Acceptance k or an Acceptance continuous with k, whichever is later.

c. If the SAA finds that $CAD^k_i < CADL_d$ (the Continuous Acceptance Duration Limit set by BSCCo), then it shall flag Acceptance k. In any other case, the Acceptance will remain un-flagged.

3.11 Accepted Offer Volume and Accepted Bid Volume

3.11.1 The SAA shall calculate the Accepted Offer Volume and Accepted Bid Volume by ensuring that the Accepted Offer Volume ($qAO^{kn}_{ij}(t)$) represents the volume (in MWh) of Offer n accepted as a result of Bid-Offer Acceptance k from BM Unit i at spot times t within Settlement Period j. It is the positive part of the Accepted Bid-Offer Volume.

$$qAO^{kn}_{ij}(t) = Max \{qABO^{kn}_{ij}(t), 0\}$$

3.11.2 Similarly, the Accepted Bid Volume ($qAB^{kn}_{ij}(t)$) represents the volume of Bid n accepted as a result of Bid-Offer Acceptance k from BM Unit i at spot times t within Settlement Period j. It is the negative part of the Accepted Bid-Offer Volume.

$$qAB^{kn}_{ij}(t) = Min \{qABO^{kn}_{ij}(t), 0\}$$

3.12 Calculation of Period Accepted Offer Volume and Period Accepted Bid Volume

3.12.1 The SAA shall determine the Period Accepted Offer Volume (QAO^{kn}_{ij}) by integrating the Accepted Offer Volume over all spot times t in Settlement Period j. It

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[2] Section 3.10 refers to Settlement Days on or after the P194 effective date until the P217 effective date. For Settlement Days on or after the P217 effective date refer to BSC Section T and Annex T-1 for the description of the CADL process.

represents the half-hourly integrated volume of Offer n, in MWh, accepted as a result of Bid-Offer Acceptance k.

3.12.2   The SAA shall determine the Period Accepted Bid Volume (QAB^{kn}_{ij}) by integrating the Accepted Bid Volume over all spot times, t, in Settlement Period, j. It represents the half-hourly integrated volume of Bid n, in MWh, accepted as a result of Bid-Offer Acceptance k.

3.13   Calculation of Period BM Unit Total Accepted Offer Volume and Period BM Unit Total Accepted Bid Volume

3.13.1   The Period BM Unit Total Accepted Offer Volume (QAO^{n}_{ij}) is the total MWh volume of Offer n accepted from all Bid-Offer Acceptances. It shall be determined by the SAA as follows:

$$QAO^{n}_{ij} = \Sigma^{k} QAO^{kn}_{ij}$$

3.13.2   The Period BM Unit Total Accepted Bid Volume (QAB^{n}_{ij}) is the total MWh volume of Bid n accepted from all Bid-Offer Acceptances. It shall be determined by the SAA as follows:

$$QAB^{n}_{ij} = \Sigma^{k}QAB^{kn}_{ij}$$

3.14   Calculation of Period BM Unit Total Priced Accepted Offer Volume and Period BM Unit Total Accepted Bid Volume (only required for Settlement Days on or after the P194 effective date until the P217 effective date)[3]

3.14.1   The Period BM Unit Total Priced Accepted Offer and Bid Volumes ($QAPO^{n}_{ij}$ and $QAPB^{n}_{ij}$) exclude any Accepted Bid and Offer Volumes where there exists in a particular Settlement Period, a Continuous Acceptance k' with $CAD^{k}_{i} < CADL_{d}$.

If, for each Settlement Period j and BM Unit i there exists *any* Continuous Acceptance k' that has been flagged, then:

i.   from and including the Settlement Period in which the earliest Point Acceptance Volume associated with k' falls, and

ii.   to and including the Settlement Period in which the latest Point Acceptance Volume associated with k' falls,

no values for the Period BM Unit Total Priced Accepted Bid or Offer Volumes will be determined in relation to those Settlement Periods, i.e.

$QAPO^{n}_{ij} = 0$, and

$QAPB^{n}_{ij} = 0$.

Note that this applies to the whole of a Settlement Period. For example, if a Continuous Acceptance which affects the first 5 minutes of period j has been

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[3] The values $QAPO^{kn}_{ij}$ and $QAPB^{kn}_{ij}$ are intermediate steps in the calculations and are not stored or reported by the SAA, therefore they are not required in this Service Description.

flagged, and in the last 20 minutes another non-flagged Acceptance has begun, all the volumes are set to zero.

In any other case,

$$QAPO^n_{ij} = QAO^n_{ij}, \text{ and}$$

$$QAPB^n_{ij} = QAB^n_{ij}.$$

In addition, an Acceptance that starts or ends on a Settlement Period boundary is taken to exist simultaneously in the adjoining Settlement Period. Therefore if a Continuous Acceptance k' is flagged and ends on the boundary between periods j and j + 1, the Priced Bid-Offer Acceptance Volumes of both Settlement Periods will be set to zero.

3.15 Calculation of Period BM Unit Offer Cashflow and Period BM Unit Bid Cashflow

3.15.1 The SAA shall calculate the Period BM Unit Offer Cashflow CO^n_{ij} as:

$$CO^n_{ij} = QAO^n_{ij} * PO^n_{ij} * TLM_{ij} \ (=\Sigma^k CAO^{kn}_{ij})$$

This represents the Transmission Loss adjusted cashflow relating to BM Unit i for BM action in Settlement Period j, allocated to Offer n.

3.15.2 The SAA shall calculate the Period BM Unit Bid Cashflow CB^n_{ij} as:

$$CB^n_{ij} = QAB^n_{ij} * PB^n_{ij} * TLM_{ij} \ (=\Sigma^k CAB^{kn}_{ij})$$

This represents the Transmission Loss adjusted cashflow relating to BM Unit i for BM action in Settlement Period j, allocated to Bid n. Under normal circumstances, this will be negative as QAB^n_{ij} is negative and PB^n_{ij} is normally positive.

3.16 Calculation of Period BM Unit Cashflow

3.16.1 The Period BM Unit Cashflow CBM_{ij} represents the total payment to BM Unit i as a result of accepted BM action in Settlement Period j. It shall be calculated by the SAA as follows:

$$CBM_{ij} = \Sigma^n CO^n_{ij} + \Sigma^n Cb^n_{ij}$$

3.17 Calculation of Total System BM Cashflow

3.17.1 The SAA shall calculate the Total System BM Cashflow by ensuring that the Total System BM Cashflow, $TCBM_j$, represents the total payments and charges in respect of BM action for all BM Units (excluding any non-delivery adjustments) in Settlement Period j.

$$TCBM_j = \Sigma_i CBM_{ij}$$

3.17.2 In respect of each Settlement Day, for each Party p, the Daily Party BM Unit Cashflow shall be determined as:

$$CBM_p = \Sigma_j \, \Sigma_{i \in p} \, CBM_{ij}$$

where Σ_j is the sum over all Settlement Periods and $\Sigma_{I \in p}$ is the sum of all BM Units for which Party p is the Lead Party.

3.17A   Calculation of Reserve Scarcity Price (RSVPj)

3.17A.1 In respect of each Settlement Period, the SAA shall calculate the Reserve Scarcity Price as:

$$RSVP_j = LoLP_j * VoLL$$

where $LoLP_j$ is the Final Loss of Load Probability for the Settlement Period and VoLL is the Value of Lost Load system parameter.

3.17A.2 Subject to paragraph 3.17A.3, from 1 November 2018, if the NETSO reports a 'null' Final Loss of Load Probability or fails to report any Final LoLP for a Settlement Period then the Final Loss of Load Probability shall be the most recently reported Indicative Loss of Load Probability for that Settlement Period.

3.17A.3 If no Final Loss of Load Probability is available (whether provided by the NETSO or derived in accordance with 3.17A.2) for a Settlement Period then the Final Loss of Load Probability shall be NULL and the Reserve Scarcity Price shall be calculated as:

$$RSVP_j = 0$$

3.17B   Calculation of STOR Action Price

3.17B.1 In respect of each Settlement Period that is in a STOR Availability Window, for each accepted Offer that is a STOR Action, the SAA shall determine the STOR Action Price ($STAP^t_j$) as the greater of the Offer Price (PO^n_{ij}) or the Reserve Scarcity Price ($RSVP_j$) applicable to that Settlement Period.

3.17B.2 In respect of each Settlement Period, for each Balancing Services Adjustment Action that is a STOR Action, the SAA shall determine the $STAP^t_j$ shall be determined as the greater of the Balancing Services Adjustment Price ($BSAP^m_j$) or the Reserve Scarcity Price ($RSVP_j$) applicable to that Settlement Period.

3.17C   Calculation of System Demand Control Volume

3.17C.1 In respect of each Demand Control Instruction, for each Demand Control Event Stage, the SAA shall determine:

a.   the Start Point Demand Control Level as the Demand Control Event Estimate determined as at the relevant time and date notified by the Transmission Company in accordance with Section Q6.9.3 or Q6.9.4 of the BSC; and

b.   the End Point Demand Control Level as the Demand Control Event Estimate determined as at the Demand Control Event End Point notified by the NETSO in accordance with Section Q6.9.5.

3.17C.2 In respect of each Settlement Period, the SAA shall establish the Demand Control Volume for each Demand Control Event Stage by linear interpolation from the values of Start Point Demand Control Level and End Point Demand Control Level.

3.17C.3 In respect of each Settlement Period:

a.   the System Demand Control Volume ($QSDC_j$) shall be equal to the sum of the Demand Control Volumes determined under paragraph 3.17C.2 where the Demand Control Volume Notice has included a System Management Action Flag set to "Yes";

b.   the Balancing Demand Control Volume ($QBDC_j$) shall be equal to the sum of the Demand Control Volumes determined under paragraph 3.17C.2 where the Demand Control Volume Notice has included a System Management Action Flag set to "No".

3.18   Settlement of Information Imbalances

3.18.1 The Information Imbalance Charge is a charge applied to the difference between the value of FPN for a BM Unit as modified by any Bid-Offer Acceptances and the actual metered Generation or Demand for that BM Unit. The Lead Energy Account is charged the total costs of Information Imbalance associated with the BM Unit. This is detailed in Sections 3.20 and 3.21 below.

3.18.2 The Information Imbalance Price will initially be set to zero. If necessary, a non-zero Information Imbalance Price could be introduced at any time in order to provide incentives on BSC Trading Parties to submit accurate FPN data.

3.19   Calculation of Period FPN

3.19.1 The SAA shall ensure that the Period FPN (FPN_{ij}) is the value in MWh calculated for BM Unit i, by integrating the value of $FPN_{ij}(t)$ across all times t, falling within Settlement Period j.

3.20   Calculation of Period BM Unit Balancing Services Volume

3.20.1 The SAA shall ensure that the Period BM Unit Balancing Services Volume (QBS_{ij}) represents the net quantity of Balancing Services energy, consisting of accepted Bids and Offers, and volume associated with Applicable Balancing Services from BM Unit i in Settlement Period j . It is determined as follows:

$$QBS_{ij} = \Sigma^n (QAO^n_{ij} + QAB^n_{ij}) + QAS_{ij} + BMUADDV_{ij} - QDD_{ij}$$

3.20.2 For the purpose of the calculation in 3.20.1, the SAA shall set QAS_{ij} to zero in cases where BM Unit Applicable Balancing Services Volume is not provided by the NETSO.

3.21 Calculation of Period Expected Metered Volume

3.21.1 The SAA shall calculate the Period Expected Metered Volume QME_{ij} as follows:

$$QME_{ij} = FPN_{ij} + QBS_{ij}$$

3.21.2 The Period Expected Metered Volume is the volume of energy that a particular BM Unit is expected to produce or consume in Settlement Period j. It is this that will be compared to BM Unit Metered Volume (QM_{ij}) to determine the Information Imbalance Volume.

The SAA shall receive BM Unit Metered Volumes (QM_{ij}) for each Settlement Period and each BM Unit from:

- the CDCA, for CVA BM Units;

- Interconnector Administrators, for Interconnector BM units;

- the SVAA, for Supplier BM Units.

In the case of Supplier BM Units,

$$QM_{ij} = - BMUADV_{ij}$$

where $BMUADV_{ij}$ is the BM Unit Allocated Demand Volume.

3.22 Calculation of Period Information Imbalance Volume

3.22.1 The SAA shall calculate the Period Information Imbalance Volume (QII_{ij}) for each BM Unit for each Settlement Period as the modulus of the difference between the BM Unit Metered Volume (QM_{ij}) and the Period Expected Metered Volume (QME_{ij}).

$$QII_{ij} = | QM_{ij} - QME_{ij}|$$

3.23 Calculation of Information Imbalance Charge

3.23.1 The SAA shall calculate the Information Imbalance Charge by ensuring that the Information Imbalance Charge (CII_{ij}) is the charge applied to the Lead Energy Account for each BM Unit i for each Settlement Period, j. It is calculated as follows:

$$CII_{ij} = QII_{ij} * IIP_{ij}$$

3.24 Calculation of Total System Information Imbalance Charge

3.24.1 The SAA shall calculate the Total System Information Imbalance Charge by ensuring that the Total System Information Imbalance Charge ($TCII_j$) is the total Information Imbalance Charge paid by all participants in a particular Settlement Period.

$$TCII_j = \Sigma_i CII_{ij}$$

Where Σ_i is the sum of all BM Units.

3.25   Daily Party Information Imbalance Charge

3.25.1   In respect of each Settlement Day, for each Party p, the Daily Party Information Imbalance Charge shall be determined as:

$$CII_p = \Sigma j \, \Sigma i \in p \, CIIij$$

where Σ_j represents the sum over all Settlement Periods and $\Sigma_{i \in p}$ represents the sum over all BM Units for which Party p is the Lead Party.

3.26A   Calculation of Energy Imbalance Prices for Settlement Days on or after the P194 effective date until the P217 effective date

3.26A.1   For Settlement Days on or after the P194 effective date until the P217 effective date, the SAA shall calculate the Energy Imbalance Price from a proportion (the PAR volume) of the priced balancing actions remaining after De Minimis, Arbitrage, CADL and NIV Tagging. This proportion shall be called the Price Averaging Reference (PAR) volume. For each Settlement Period the following processes will be applied:

- Any accepted Bid or Offer Volumes that have been identified and tagged as being of short duration (a duration less than the Continuous Acceptance Duration Limit) according to Section 3.10 will have their volume included in the calculation of Net Imbalance Volume, but will be disregarded for the purposes of the calculation of the Energy Imbalance Price.

- Any accepted Offers with volumes lower than $DMAT_d$ are tagged as De Minimis Accepted Offers and removed from the calculation; any accepted Bids with volumes greater than $-DMAT_d$ are tagged as De Minimis Accepted Bids and removed from the calculation. If the $DMAT_d$ is set to zero, no Bids or Offers are excluded.

- The Offers and Bids are ranked in price order (known as stacks or ranked sets) and are then inspected for arbitrage trades – these are where the Bid price of an accepted Bid exceeds the Offer price of any accepted Offer. Any arbitrage volume is removed from the calculation – this could take the form of whole or part Offers/Bids.

- BSAD is then inserted into the ranked sets. The non-zero (net) Buy Price Volume Adjustment (Energy) ($EBVA_j$) is inserted into the Offer stack in order of price (derived from $EBCA_j/EBVA_j$, i.e. a £/MWh price). The non-zero Total System Un-priced Accepted Offer Volume ($TQUAO_j$) is placed at the top of the Offer stack. The non-zero (net) Buy Price Volume Adjustment (System)($SBVA_j$) is then inserted into the Offer stack below the Total System Un-priced Accepted Offer Volume.

- For each Settlement Period the Net Imbalance Volume will be derived as the volume by which the total volume of Bids accepted and volume of

        BSAD sales exceeds the total volume of Offers accepted and volume of BSAD purchases (or vice versa).

- This is done by NIV tagging the remaining price ordered stacks in the following order: un-priced Bid or Offer Acceptance volumes first, then system BSAD volume and then most expensive Priced Offers or least expensive Priced Bids and Energy BSAD volume, until all of the volume associated with the smaller stack (and an equivalent volume on the larger stack) has been NIV tagged. The volume that is not NIV tagged is the Net Imbalance Volume.

- PAR Tagging will be performed on the remaining Offers (including priced buy BSAD volumes) and Bids (including priced sell BSAD volumes) in the Net Imbalance Volume, starting from the most expensive Bid and least expensive Offer, Bids and Offers are tagged until the total remaining volume is not more than the PAR Volume (500MWh).

- Following PAR tagging the volume weighted average of the PAR is calculated. Once this volume weighted average is known the BPA_j (for Settlement Periods where the NIV is positive) or SPA_j (for Settlement Periods where the NIV is negative) is added.

- Finally the appropriate TLM is applied to the resulting calculation, noting that,

$$TLM_{ij} = 1 + TLMO^{+}_{ij} + TLF_{ij} \quad \text{for BM Units in delivering Trading Units}$$

$$TLM_{ij} = 1 + TLMO^{-}_{ij} + TLF_{ij} \quad \text{for BM Units in offtaking Trading Units}$$

3.26B   Changes to Settlement Data arising from Emergency Instructions for Settlement Days on and after the P194 effective date until the P217 effective date

3.26B.1 On receipt of Acceptance Data from the NETSO relating to an Emergency Instruction, the SAA shall obtain approval from BSCCo to enter such data into Settlement, prior to entering it into the SAA database.

3.26B.2 Where the NETSO has identified the Emergency Instruction as being an 'Excluded Emergency Acceptance', the SAA shall receive from BSCCo recalculated main Energy Imbalance Prices for each affected Settlement Period which have been calculated by including the Emergency Acceptance Volume as an un-priced volume.

3.26B.3 Following the receipt of the recalculated Energy Imbalance Prices from BSCCo and to meet the timescales of the next scheduled Run, the SAA shall:

- Calculate the amendments to BSAD required to generate the recalculated Energy Imbalance Prices for the next scheduled Settlement Run[4].

- Carry out a 'dry run' of the Settlement Run.

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[4] For the avoidance of doubt, the BSAD is to be manipulated to arrive at the recalculated Energy Imbalance Prices, as these Prices cannot be directly inputted into the SAA database. This will not result in any amendments being made to the BSAD submitted by the NETSO and published on the BMRS.

• Provide confirmation to BSCCo that the Energy Imbalance Prices calculated by SAA using amended BSAD is acceptable[5].

• Obtain authorisation from BSCCo to use amended BSAD in the live Settlement Run.

• Following receipt of authorisation from BSCCo, ensure amended BSAD is used in live Settlement Run[6], to meet Settlement Calendar timescales.

3.26C Calculation of Energy Imbalance Prices for Settlement Days on or after the P217 effective date

3.26C.1 For Settlement Days on or after the P217 effective date, the SAA shall calculate the Energy Imbalance Price using the P217 methodology. For the complete description of the calculation see BSC Section T and Annex T-1. The key points of the P217 methodology are:

• BSAD is disaggregated into several Balancing Services Adjustment Actions for each Settlement Period. Aggregated BSAD will also be submitted by the NETSO, however, the following aggregated variables will be submitted as zero:

   o Buy-Price Cost Adjustment (Energy) ($EBCA_j$) – submitted as zero;

   o Buy-Price Volume Adjustment (Energy) ($EBVA_j$) – submitted as zero;

   o Buy-Price Volume Adjustment (System) ($SBVA_j$) – submitted as zero;

   o Sell-Price Cost Adjustment (Energy) ($ESCA_j$) – submitted as zero;

   o Sell-Price Volume Adjustment (Energy) ($ESVA_j$) – submitted as zero; and

   o Sell-Price Volume Adjustment (System) ($SSVA_j$) – submitted as zero.

• Bid-Offer Acceptances and Balancing Services Adjustment Actions undergo the same flagging, classification and calculation processes. Together they are known as System Actions.

• All System Actions undergo De Minimis and Arbitrage Tagging.

• System Actions may be 'Flagged'. Flagging is the identification of System Actions which are deemed to be taken for reasons other than resolving the short-term energy imbalance. There are three types of Flagging.

   o SO-Flagging of balancing actions deemed as potentially being impacted by transmission constraints;

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[5] Where there is a discrepancy between the Energy Imbalance Prices calculated by BSCCo and the prices reached by the SAA using the amended BSAD, and the discrepancy exceeds the threshold of £0.05, the SAA shall liaise with BSCCo to resolve the discrepancy prior to the scheduled live Settlement Run.
[6] The SAA shall perform checks to ensure the amended BSAD is not subsequently overwritten and is used in the live Settlement Run.

- Emergency Flagging of Emergency Instructions; and

- Continuous Acceptance Duration Limit (CADL) Flagging of short duration actions (this only applies to Bid-Offer Acceptances).

These Flagged System Actions are referred to as First Stage Flagged.

- All System Actions undergo Classification in order to determine whether they retain their price. Actions which are not First Stage Flagged are referred to as Unflagged. These System Actions retain their price.

- For First Stage Flagged System Actions the following occurs:

  - In the Buy Stack, all First-Stage Flagged System Buy Actions with a price which is more expensive (from the point of view of the System – the higher the price the more expensive the Buy Action) than the most expensive Unflagged System Buy Action are classified as Second-Stage Flagged System Actions and are unpriced

  - In the Sell Stack, all First-Stage Flagged System Sell Actions with a price which is more expensive (from the point of view of the System – the lower the price the more expensive the Sell Action) than the most expensive Unflagged System Sell Action are classified as Second-Stage Flagged System Actions and are unpriced.

- Balancing Services Adjustment Actions where the price is NULL are always Second Stage Flagged.

- Following Classification Net Imbalance Volume tagging occurs. Starting from the lowest priced Sell System Action and highest priced System Buy Action, System Actions from the two stacks are matched and tagged until the smaller (in total volume) of the two stacks is completely tagged. Unpriced System Actions are included in NIV Tagging. Unpriced Sell System Actions are considered to be the lowest priced Sell Actions and Unpriced Buy System Actions are considered to be the highest priced Buy Action – i.e. where present they are the first Actions to be considered during the NIV Tagging process.

- Until the P305 effective date, if unpriced volume exists in the Net Imbalance Volume it is assigned a Replacement Price. The Replacement Price is calculated from a volume weighted average of the most expensively priced 100MWh of priced volume – the Replacement Price Average Reference (RPAR) Volume. Where the total remaining volume of untagged, priced System Action items is less than the RPAR Volume then all untagged, priced System Action items are selected. RPAR Volume is 100MWh.

- From the P305 effective date, if unpriced volume exists in the Net Imbalance Volume it is assigned a Replacement Price. The Replacement Price is calculated from a volume weighted average of the most expensively priced 1MWh of priced volume – the Replacement Price Average Reference (RPAR) Volume. Where the total remaining volume of untagged, priced System Action

items is less than the RPAR Volume then all untagged, priced System Action items are selected. RPAR Volume is 1MWh.

- Where no priced System Action items remain after NIV Tagging then the Replacement Price is the Market Price. If the Market Price is undefined then the Replacement Price is zero.

- The actual volume of System Actions used to calculate the Replacement Price is defined as the Replacement Price Calculation Volume. If the Replacement Price is derived from the Market Price then Replacement Price Calculation Volume will be considered to be zero.

- Until the P305 effective date, following the Replacement Price process the average of the most expensive volumes remaining in the Net Imbalance up to a total volume of PAR are used to set the main Energy Imbalance Price, the volumes not within PAR being 'PAR tagged'. The PAR volume will be 500MWh.

- From the P305 effective date, following the Replacement Price process the average of the most expensive volumes remaining in the Net Imbalance up to a total volume of PAR are used to set the main Energy Imbalance Price, the volumes not within PAR being 'PAR tagged'. The PAR volume will be 50MWh until 1 November 2018 when it will be 1MWh.

- Once the volume weighted average of the PAR has been calculated the BPA_j (for Settlement Periods where the NIV is positive) or SPA_j (for Settlement Periods where the NIV is negative) is added.

3.27 Calculation of System Total Accepted Offer Volume

$$TQAO_j = \Sigma_i\Sigma^n QAO^n_{ij}$$

3.28 Calculation of System Total Accepted Bid Volume

$$TQAB_j = \Sigma_i\Sigma^n QAB^n_{ij}$$

3.29 Calculation of System Total Un-priced Accepted Offer Volume for Settlement Days on or after the P194 effective date until the P217 effective date

$$TQUAO_j = \Sigma_i\Sigma^n QAO^n_{ij} - \Sigma_i\Sigma^n QAPO^n_{ij}$$

3.30 Calculation of System Total Un-priced Accepted Bid Volume for Settlement Days on or after the P194 effective date until the P217 effective date

$$TQUAB_j = \Sigma_i\Sigma^n QAB^n_{ij} - \Sigma_i\Sigma^n QAPB^n_{ij}$$

3.30A   Calculation of Net Imbalance Volume (NIV) for Settlement Days on or after the P194 Implementation Date until the P217 effective date

3.30A.1 In respect of each Settlement Period, the Net Imbalance Volume will be determined as follows:

$$NIV_j = \{\Sigma_i \Sigma^n \, QAPO^n_{ij} + EBVA_j + SBVA_j + TQUAO_j\} \; - \\ \{\Sigma_i \Sigma^n \, (-QAPB^n_{ij}) + (-ESVA_j) + (-SSVA_j) + (-TQUAB_j)\}$$

where Σ_i is the sum over all BM Units and Σ^n is either the sum over all Accepted Offers that are not De Minimis Accepted Offers and not Arbitrage Accepted Offers, or the sum over all Accepted Bids that are not De Minimis Accepted Bids and not Arbitrage Accepted Bids, as the case may be.

3.31   Calculation of System Buy Price (SBP)for Settlement Days on or after the P194 effective date until the P217 effective date

3.31.1   In respect of each Settlement Period:

(a)   if the Net Imbalance Volume is not equal to zero, and is a positive number, and $\{\Sigma_i \Sigma^n \, \{QAPO^n_{ij} * TLM_{ij}\} + UEBVA_j\}$ is not equal to zero, then the System Buy Price will be determined as follows:

$$SBP_j = \{\{\Sigma_i \Sigma^n \, \{QAPO^n_{ij} * PO^n_{ij} * TLM_{ij}\} + UEBCA_j\} \; / \\ \{\Sigma_i \Sigma^n \, \{QAPO^n_{ij} * TLM_{ij}\} + UEBVA_j\}\} \; + \; \{BPA_j\}$$

where Σ_i represents the sum over all BM Units and Σ^n represents the sum over those accepted Offers that are not De Minimis Accepted Offers and not Arbitrage Accepted Offers and not NIV Tagged Offers[7];

(b)   if the Net Imbalance Volume is equal to zero, or is a negative number, and / or $\{\Sigma_i \Sigma^n \, \{QAPO^n_{ij} * TLM_{ij}\} + UEBVA_j\}$ is equal to zero, then the System Buy Price will (subject to paragraph 3.32A.1) be determined as follows:

$$SBP_j = \Sigma_s \, \{PXP_{sj} * QXP_{sj}\} \, / \, \Sigma_s \, \{QXP_{sj}\}$$

where Σ_s represents the sum over all Market Index Data Providers;

provided that, if the Net Imbalance Volume is a negative number and SSP_j as determined in accordance with paragraph 3.32.1(a) would exceed SBP_j as determined in this paragraph (b), then SBP_j shall instead be equal to SSP_j as determined in accordance with paragraph 3.32.1(a).

3.31A   Calculation of System Buy Price (SBP) for Settlement Days on or after the P217 effective date

3.31A.1 Refer to BSC Section T for the calculation of System Buy Price for Settlement Days on or after the P217 effective date.

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[7] Settlement Days on or after P194 Implementation Date will also be PAR tagged

3.32 Calculation of System Sell Price (SSP) for Settlement Days on or after the P194 effective date until the P217 effective date

3.32.1 In respect of each Settlement Period:

(a) if the Net Imbalance Volume is not equal to zero, and is a negative number, and $\{\Sigma_i \Sigma^n \{QAPB^n_{ij} * TLM_{ij}\} + UESVA_j\}$ is not equal to zero, then the System Sell Price will be determined as follows:

$$SSP_j = \{\{\Sigma_i \Sigma^n \{QAPB^n_{ij} * PB^n_{ij} * TLM_{ij}\} + UESCA_j\} /$$

$$\{\Sigma_i \Sigma^n \{QAPB^n_{ij} * TLM_{ij}\} + UESVA_j\}\} + \{SPA_j\}$$

where Σ_i represents the sum over all BM Units and Σ^n represents the sum over those accepted Bids that are not De Minimis Accepted Bids and not Arbitrage Accepted Bids and not NIV Tagged Bids[8];

(b) if the Net Imbalance Volume is equal to zero, or is a positive number, and / or $\{\Sigma_i \Sigma^n \{QAPB^n_{ij} * TLM_{ij}\} + UESVA_j\}$ is equal to zero, then the System Sell Price will (subject to paragraph 3.31.1) be determined as follows:

$$SSP_j = \Sigma_s \{PXP_{sj} * QXP_{sj}\} / \Sigma_s \{QXP_{sj}\}$$

where Σ_s represents the sum over all Market Index Data Providers;

provided that, if the Net Imbalance Volume is a positive number and SSP_j as so determined would exceed SBP_j as determined in accordance with paragraph 3.31.1(a), then SSP_j shall instead be equal to SBP_j as determined in accordance with paragraph 3.31.1(a).

3.32A Calculation of System Sell Price (SSP) for Settlement Days on or after the P217 effective date

3.32A.1 Refer to BSC Section T for the calculation of System Sell Price for Settlement Days on or after the P217 effective date.

3.32B Defaulting and capping scenarios (Price Derivation Codes) for Settlement Days on or after the P194 effective date until the P217 effective date

3.32B.1 If in respect of a Settlement Period $\Sigma_s \ QXP_{sj} = 0$:

where Σ_s represents the sum over all Market Index Data Providers,

then:

(a) if the Net Imbalance Volume is a positive number, and $\{\Sigma_i \Sigma^n \{QAPO^n_{ij} * TLM_{ij}\} + UEBVA_j\}$ is not equal to zero, SSP_j shall be equal to SBP_j as determined in accordance with paragraph 3.31.1(b):

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[8] Settlement Days on or after P194 Implementation Date will also be PAR tagged

(b)   if the Net Imbalance Volume is a positive number, and $\{\Sigma_i \Sigma^n \{QAPO^n_{ij} * TLM_{ij}\} + UEBVA_j\}$ is equal to zero, each of SBP_j and SSP_j shall be zero;

(c)   if the Net Imbalance Volume is a negative number, and $\{\Sigma_i \Sigma^n \{QAPB^n_{ij} * TLM_{ij}\} + UESVA_j\}$ is not equal to zero, SBP_j shall be equal to SSP_j as determined in accordance with paragraph 3.32.1(b);

(d)   if the Net Imbalance Volume is a negative number, and $\{\Sigma_i \Sigma^n \{QAPB^n_{ij} * TLM_{ij}\} + UESVA_j\}$ is equal to zero, each of SBP_j and SSP_j shall be zero; and

(e)   if the Net Imbalance Volume is zero, each of SBP_j and SSP_j shall be zero.

The 12 different default and capping scenarios are contained in Appendix C.

3.32C   Defaulting and capping scenarios (Price Derivation Codes) for Settlement Days on or after the P217 effective date

3.32C.1 If in respect of a Settlement Period $\Sigma_s QXP_{sj} = 0$:

where Σ_s represents the sum over all Market Index Data Providers,

then until the P305 effective date:

(a)   if the Net Imbalance Volume is a positive number, and $\{\Sigma_i \Sigma^n \Sigma^k \{QAO^{kn}_{ij} * TLM_{ij}\} + \Sigma^m QBSAB^m_j\}$ is not equal to zero, SSP_j shall be equal to SBP_j as determined in accordance with paragraph 3.31A.1(b);

(b)   if the Net Imbalance Volume is a positive number, and $\{\Sigma_i \Sigma^n \Sigma^k \{QAO^{kn}_{ij} * TLM_{ij}\} + \Sigma^m QBSAB^m_j\}$ is equal to zero, each of SBP_j and SSP_j shall be zero;

(c)   if the Net Imbalance Volume is a negative number, and $\{\Sigma_i \Sigma^n \Sigma^k \{QAB^{kn}_{ij} * TLM_{ij}\} + \Sigma^m QBSAS^m_j\}$ is not equal to zero, SBP_j shall be equal to SSP_j as determined in accordance with paragraph 3.32A.1(b);

(d)   if the Net Imbalance Volume is a negative number, and $\{\Sigma_i \Sigma^n \Sigma^k \{QAB^{kn}_{ij} * TLM_{ij}\} + \Sigma^m QBSAS^m_j\}$ is equal to zero, each of SBP_j and SSP_j shall be zero; and

(e)   if the Net Imbalance Volume is zero, each of SBP_j and SSP_j shall be zero.

Else, from the P305 effective date then:

(f)   if the Net Imbalance Volume is equal to zero, or if the Net Imbalance Volume is not equal to zero and is a positive number and $\{\Sigma_i \Sigma^n \Sigma^k \{QAO^{kn}_{ij} * TLM_{ij}\} + \Sigma^m QBSAB^m_j + \Sigma^t QSIV^t_j + QSDC_j + QBDC_j\}\}$ is equal to zero, or if the Net Imbalance Volume is not equal to zero and is a negative number and $\{\Sigma_i \Sigma^n \Sigma^k \{QAB^{kn}_{ij} * TLM_{ij}\} + \Sigma^m QBSAS^m_j\}$ is equal to zero, then:

(i)   the System Buy Price will be equal to zero; and

(ii)   the System Sell Price shall be equal to the System Buy Price as determined in 3.32 (f)(i).

The 14 different default and capping scenarios are contained in Appendix C.

3.33   Calculation of Total Accepted Priced Offer Volume for Settlement Days on or after the P194 effective date until the P217 effective date

The SAA shall calculate the Total Accepted Priced Offer Volume for each Settlement Period. This is the offer volume that was used to determine the System Buy Price for that Settlement Period.

$$TQPAO_j = \Sigma_i \Sigma^n QAPO^n_{ij}$$

where Σ_i represents the sum over all BM Units and Σ^n represents the sum over those accepted Offers that are not De Minimis Accepted Offers, Arbitrage Accepted Offers or Tagged[9] Offers.

3.34   Calculation of Total Accepted Priced Bid Volume for Settlement Days on or after the P194 effective date until the P217 effective date

The SAA shall calculate the Total Accepted Priced Bid Volume for each Settlement Period. This is the bid volume that was used to determine the System Sell Price for that Settlement Period.

$$TQPAB_j = \Sigma_i \Sigma^n QAPB^n_{ij}$$

where Σ_i represents the sum over all BM Units and Σ^n represents the sum over those accepted Bids that are not De Minimis Accepted Bids, Arbitrage Accepted Bids or Tagged[9] Bids.

3.35   Energy Imbalance Volumes

3.35.1   Energy Imbalance Volumes are determined for each Energy Account. A number of interim variables are needed for this calculation, as it is necessary to determine for each Energy Account the metered volumes to be allocated (Credited Energy Volume), the volume of any BM actions and the aggregated Energy Contract Volume Notifications associated with the Energy Account.

3.36   Calculation of Credited Energy Volume

3.36.1   When allocating the BM Unit Metered Volume (QM_{ij}) and the Period BM Unit Balancing Services Volume (QBS_{ij}) to Energy Account a for each Settlement Period j, under paragraphs 3.36.3 and 3.36.5:

Where BM Unit i is a Production BM Unit (has a P/C Status of Production) for that Settlement Period j, then Energy Account a shall be the Production Energy Account

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[9] Where Tagged means:

NIV Tagged and PAR Tagged for Settlement Days on or after P194 Implementation Date until the P217 effective date.

Otherwise,

Where BM Unit i is a Consumption BM Unit (has a P/C Status of Consumption) for that Settlement Period j, then Energy Account a shall be the Consumption Energy Account.

3.36.2 For each Settlement Period j, the SAA shall determine the P/C Status of BM Unit i according to the rules applied by the CRA[10] for the corresponding Settlement Day. The SAA shall retain a record of the P/C Status applied in the Credited Energy Volume calculation for each BM Unit i and Settlement Period j.

3.36.3 The SAA shall allocate the Credited Energy Volume QCE_{iaj} from each BM Unit i, to each Subsidiary Energy Account a for each Settlement Period j, as follows:

$$QCE_{iaj} = \{(QM_{ij} - QBS_{ij})*(QMPR_{iaj}/100) + QMFR_{iaj}\}*TLM_{ij}$$

Values of QCE_{iaj} are then rounded towards zero.

Where $a \neq A$, and A is the Lead Energy Account for BM Unit i; $QMFR_{iaj}$ is the Metered Volume Fixed Reallocation, a fixed volume in MWh, assigned to Energy Account a from BM Unit i in Settlement Period j; $QMPR_{iaj}$ is the Metered Volume Percentage Reallocation, the percentage of the BM Unit Metered Volume that remains after QMFRs and BM actions have been deducted, which is allocated to Energy Account a from BM Unit i in Settlement Period j; and QM_{ij} is the BM Unit Metered Volume.

3.36.4 The above calculation represents a pro-rata of the loss adjusted metered volume across those Energy Accounts that have title to a proportion of the metered volume. The pro-rata needs to take account of volumes of BM action accepted for the BM Unit.

3.36.5 The SAA shall determine the Credited Energy Volume from each BM Unit i, for the Lead Energy Account (a = A) for each Settlement Period j, as follows:

$$QCE_{iAj} = (QM_{ij} * TLM_{ij}) - \Sigma_{a \neq A} QCE_{iaj}$$

Where $\Sigma_{a \neq A}$ represents a sum over all values of a, other than a = A.

This allocates any residual metered volume, including any BM action to the Lead Energy Account.

3.36.6 The treatment of Interconnector BM Units shall be in accordance with Section T 4.1 of the Code.

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[10] As detailed in the CRA Service Description.

3.37 Calculation of Account Credited Energy Volume

3.37.1 The SAA shall calculate the Account Credited Energy Volume ($QACE_{aj}$) for each Energy Account a, as follows:

$$QACE_{aj} = \Sigma_i \, QCE_{iaj}$$

3.38 Calculation of Account Period Bid-Offer Volume

3.38.1 The SAA shall ensure that the Account Period Balancing Services Volume ($QABS_{aj}$) represents the net volume of accepted Balancing Services energy, consisting of accepted Bids and Offers, and volume associated with Applicable Balancing Services attributable to each Energy Account a, in Settlement Period j. It is calculated as follows:

$$QABS_{aj} = \Sigma_i \, QBS_{ij} * TLM_{ij}$$

Where Σ_i represents a sum over all BM Units i for which Energy Account a is the Lead Energy Account.

3.38A Calculation of Total Period Applicable Balancing Services Volume

3.38A.1 In respect of each Settlement Period, the Total Period Applicable Balancing Services Volume will be determined as follows:

$$TQAS_j = \Sigma_i \, QAS_{ij}$$

Where Σ_i represents the sum over all BM Units.

3.39 Calculation of Account Energy Imbalance Volume

3.39.1 The SAA shall determine the Account Energy Imbalance Volume ($QAEI_{aj}$) attributable to each Energy Account a, in Settlement Period j as follows:

$$QAEI_{aj} = QACE_{aj} - QABS_{aj} - QABC_{aj}$$

3.40 Calculation of Total System Energy Imbalance Volume

3.40.1 The SAA shall ensure that the Total System Energy Imbalance Volume ($TQEI_j$) is the total Energy Imbalance Volume in Settlement Period j, summed across all Energy Accounts a except the NETSO, as follows:

$$TQEI_j = \Sigma_{a \notin S} \, QAEI_{aj}$$

Where $\Sigma_{a \notin S}$ is the sum over all Energy Accounts a except the NETSO.

3.41 Calculation of the Energy Imbalance Cashflow

3.41.1 In respect of each Settlement Period, the Account Energy Imbalance Cashflow for each Energy Account other than the Energy Accounts held by the the NETSO will be determined as follows:

if $QAEI_{aj} > 0$ then $CAEI_{aj} = -QAEI_{aj} * SSP_j$

Otherwise $CAEI_{aj} = -QAEI_{aj} * SBP_j$

In respect of each Settlement Period, the Account Energy Imbalance Cashflow for each Energy Account held by the the NETSO will be determined as follows: $CAEI_{aj} = 0$

3.42 Calculation of the Total System Energy Imbalance Cashflow

3.42.1 The SAA shall ensure that the Total System Energy Imbalance Cashflow ($TCEI_j$) represents the total cashflow relating to settlement of energy imbalances in Settlement Period j. It is defined as follows:

$$TCEI_j = \Sigma_{a \notin S}\, CAEI_{aj}$$

Where $\Sigma_{a \notin S}$ is the sum over all Energy Accounts a except the NETSO.

3.42.2 In respect of each Settlement Day, for each Party p, the Daily Party Energy Imbalance Cashflow shall be determined as:

$$CAEI_p = \Sigma_j\, \Sigma_{a \in p}\, CAEI_{aj}$$

where Σ_j represents the sum over all Settlement Periods and $\Sigma_{a \in p}$ represents the sum over the Energy Accounts of Party p.

3.43 BM Non-delivery Rule

3.43.1 Non-delivery arises when there is a BM Unit imbalance in the opposite direction to the volume of accepted Offers or Bids, integrated over the Settlement Period. An additional charge, payable by the Lead Party associated with the relevant BM Unit, will be made on any non-delivered volumes.

3.43.2 If a BM Unit has more than one Offer (or Bid) accepted, the non-delivery rule will apply first to the highest priced Offer (or lowest priced Bid) up to the Period BM Unit Total Accepted Offer Volume (or Period BM Unit Total Accepted Bid Volume) of that Offer (or Bid), then to the next highest priced Offer (or next lowest priced Bid) and so on.

3.43.3 If both Offers and Bids are accepted from a given BM Unit, the non-delivery rule will apply to imbalances in one direction only. Offers will be deemed non-delivered if the BM Unit under-generates or over-consumes, while Bids would be non-delivered if the BM Unit over-generates or under-consumes.

3.44 Determination of Period BM Unit Non-Delivered Offer Volume

3.44.1 The SAA shall determine the Period BM Unit Non-Delivered Offer Volume $QNDO_{ij}$ for each BM Unit i in each Settlement Period j as follows:

$$QNDO_{ij} = Min\{Max\{QME_{ij} - QM_{ij},\, 0\},\, \Sigma^n QAO^n_{ij}\}$$

3.44A Determination of Period BM Unit Non-Delivered Bid Volume

3.44A.1 The SAA shall determine the Period BM Unit Non-Delivered Bid Volume $QNDB_{ij}$ for each BM Unit i in each Settlement Period j as follows:

$$QNDB_{ij} = Max \{Min\{QME_{ij} - QM_{ij}, 0\}, \Sigma^n QAB^n_{ij} \}$$

Note that Bid volumes are negative, and so is the non-delivered Bid volume by this definition.

3.45 Determination of Offer Non-Delivery Volume

3.45.1 The SAA shall ensure that if $QNDO_{ij} > 0$, then the Period BM Unit Non-Delivered Offer Volume is apportioned across accepted Offers to determine values of Offer Non-Delivery Volume.

3.45.2 The SAA shall ensure that in each Settlement Period, the set of all accepted Offers (i.e. Offers for which $QAO^n_{ij} > 0$) is considered. This set of Offers is then ranked from highest price to lowest price. The Non-Delivery Order Number u is used for this purpose. The Offer with the highest price is allocated a Non-Delivery Order Number of u=1, the next highest priced Offer is allocated a Non-Delivery Order Number u=2 and so on until all Offers in the Settlement Period is allocated a Non-Delivery Order Number.

The set of Offers $\{QAO^{n1}_{ij}, QAO^{n2}_{ij}, \ldots\ldots QAO^{nu}_{ij}\}$ is therefore the ranked set of Offers.

3.45.3 The SAA shall ensure that the Offer Non-Delivery Volume is allocated to the highest priced Offers first. The apportionment continues until the Period BM Unit Non-Delivered Offer Volume is fully apportioned or all available Offer volumes have been used up.

Thus, the Offer Non Delivery Volume for Offer n, is:

$$QNDO^n_{ij} = Min(QAO^{nu}_{ij}, RQNDO^{u-1}_{ij})$$

Where $RQNDO^{u-1}_{ij}$ is the Remaining Period BM Unit Non-Delivered Offer Volume determined as:

$$RQNDO^u_{ij} = RQNDO^{u-1}_{ij} - QNDO^{nu-1}_{ij}$$

and $RQNDO^0_{ij} = QNDO_{ij}$,

and $QNDO^{n0}_{ij} = 0$

3.46 Determination of Bid Non-Delivery Volume

3.46.1 The SAA shall ensure that if $QNDB_{ij} < 0$, then the Period BM Unit Non-Delivered Bid Volume is apportioned across accepted Bids to determine values of Bid Non-Delivery Volume.

3.46.2 The SAA shall ensure that in each Settlement Period, the set of all accepted Bids (i.e. Bids for which $QAB^n_{ij} < 0$) is considered. This set of Bids is then ranked from lowest price to highest price. The Non-Delivery Order Number, u is used for this purpose. The Bid with the lowest price is allocated a Non-Delivery Order Number of u=1, the

next lowest priced Offer is allocated a Non-Delivery Order Number u=2 and so on until all Bids in the Settlement Period are allocated a Non-Delivery Order Number.

The set of Bids $\{QAB^{n1}_{ij}, QAB^{n2}_{ij}, \ldots\ldots QAB^{nu}_{ij}, \}$ is therefore the ranked set of Bids.

3.46.3 The SAA shall ensure that the Bid Non-Delivery Volume is allocated to the lowest priced Bids first. The apportionment continues until the Period BM Unit Non-Delivered Bid Volume is fully apportioned or all available Bid volumes have been used up.

Thus, the Bid Non Delivery Volume for Bid n, is:

$$QNDB^{n}_{ij} = Max(QAB^{nu}_{ij}, RQNDB^{u-1}_{ij})$$

Where $RQNDB^{u-1}_{ij}$ is the Remaining Period BM Unit Non-Delivered Bid Volume determined as:

$$RQNDB^{u}_{ij} = RQNDB^{u-1}_{ij} - QNDB^{nu-1}_{ij}$$

and $RQNDB^{0}_{ij} = QNDB_{ij}$

and $QNDB^{no}_{ij} = 0$

3.47 Calculation of the Non-Delivered Offer Charge

3.47.1 The SAA shall calculate the Non-Delivered Offer Charge ($CNDO^{n}_{ij}$) associated with the non-delivery of Offer n in Settlement Period j from BM Unit i as follows:

$$CNDO^{n}_{ij} = QNDO^{n}_{ij} * Max\ \{(PO^{n}_{ij} - SBP_{j}), 0\} * TLM_{ij}$$

3.48 Calculation of Non-Delivered Bid Charge

3.48.1 The SAA shall calculate the Non-Delivered Bid Charge ($CNDB^{n}_{ij}$) associated with the non-delivery of Bid n in Settlement Period j from BM Unit i as follows:

$$CNDB^{n}_{ij} = QNDB^{n}_{ij} * Min\ \{(PB^{n}_{ij} - SSP_{j}), 0\} * TLM_{ij}$$

Note that this is a product of two negative numbers that results in a positive charge (or zero).

3.49 Calculation of BM Unit Period Non-Delivery Charge

3.49.1 The SAA shall ensure that the Non-Delivery Charge (CND_{ij}) is the total charge associated with the non-delivery of Bids and Offers in Settlement Period j from BM Unit i, calculated as follows:

$$CND_{ij} = \Sigma^{n} (CNDO^{n}_{ij} + CNDB^{n}_{ij})$$

3.50   Calculation of Total System Non-Delivery Charge

3.50.1   The SAA shall ensure that the Total System Non-Delivery Charge ($TCND_j$) is the total charge associated with the non-delivery of Bids and Offers in Settlement Period j, summed across all BM Units, as follows:

$$TCND_j = \Sigma_i \; CND_{ij}$$

3.50.2   In respect of each Settlement Day, for each Party p, the Daily Party Non-Delivery Charge shall be determined as:

$$CND_p = \Sigma_j \; \Sigma_{i \in p} \; CND_{ij}$$

where Σ_j represents the sum over all Settlement Periods and $\Sigma_{i \in p}$ represents the sum over all BM Units for which Party p is the Lead Party.

3.51   BSCCo Costs

3.51.1   The costs associated with all of the activities of BSCCo (including the amounts payable by BSCCo to the SAA and other service providers) will be recovered from BSC Trading Parties in accordance with BSC Section Annex D-1.

3.51.2   A proportion of these BSCCo costs be charged out pro-rata as explained below, and the remaining proportion be charged out pro-rata on the modulus of all notified Energy Contract volumes (ECQ_{zbaj}). This money will be recovered monthly, based on a cost forecast and reconciled at year end to total actual costs.

   (i) $\Sigma^+(QCE_{aij},)$ where Σ^+ is, for each Account a in Settlement Period j, the sum over all BM Units i that are in delivering Trading Units (i.e. each Trading Unit t where $\Sigma_{i \in t} \; QM_{ij} >= \; 0$); and

   (ii) $\Sigma^-(-QCE_{aij})$, where Σ^- is, for each Account a in Settlement Period j, the sum over all BM Units i that are in importing Trading Units (i.e. each Trading Unit t where $\Sigma_{i \in t} \; QM_{ij} < 0$)

3.52   System Operator Cashflow

3.52.1   The NETSO will be charged the net cost of BM actions (amended for non-delivery) with the Total System Energy Imbalance Cashflow deducted. The manner in which these total costs are met is via a charge in each Settlement Period on the NETSO. This is defined as the System Operator BM Cashflow ($CSOBM_j$) and represents the amount of costs incurred in the Balancing Mechanism that are to be paid by the the NETSO in Settlement Period j.

$$CSOBM_j = TCBM_j - TCND_j$$

3.53   Residual Cashflow Reallocation

3.53.1   In order to ensure that the payments and charges under the BSC balance in each Settlement Period, it will be necessary to make good any deficit, or reallocate any surplus. Any residual cashflows arising under the BSC will be reapportioned on the modulus of the Credited Energy Volumes.

3.54 Determination of Total System Residual Cashflow

3.54.1 The Total System Residual Cashflow TRC_j represents any net difference between total payments and receipts to and from BSC Trading Parties for a particular Settlement Period. If it proves necessary, it will be calculated as:

$$TRC_j = TCII_j + CSOBM_j + TCND_j - TCBM_j + TCEI_j \ ^{[11]}$$

3.55 Determination of Residual Cashflow Reallocation Proportion

3.55.1 In respect of each Settlement Period, for each Energy Account, other than Energy Accounts held by the NETSO, the Residual Cashflow Reallocation Proportion will be determined as follows:

$$RCRP_{aj} = \{\Sigma^+_{(non\text{-}I)} (QCE_{aij}) + \Sigma^-_{(non\text{-}I)} (- QCE_{aij})\} / \{\Sigma_a \{\Sigma^+_{(non\text{-}I)} (QCE_{aij}) + \Sigma^-_{(non\text{-}I)} (- QCE_{aij})\}\}$$

where $\Sigma^+_{(non\text{-}I)}$ is, for each Energy Account a in Settlement Period j, the sum over all BM Units other than Interconnector BM Units that are in delivering Trading Units, and

and $\Sigma^-_{(non\text{-}I)}$ is, for each Energy Account a in Settlement Period j, the sum over all BM Units other than Interconnector BM Units that are in offtaking Trading Units, and

and Σ_a represents the sum over all Energy Accounts a, other than those held by the NETSO.

In respect of each Settlement Period, for each Energy Account held by the NETSO, the Residual Cashflow Reallocation Proportion will be determined as follows:

$$RCRP_{aj} = 0$$

3.56 Determination of Residual Cashflow Reallocation Cashflow

3.56.1 The Residual Cashflow Reallocation Cashflow ($RCRC_{aj}$) represents that proportion of the Total System Residual Cashflow allocated to the Energy Account a, as follows:

$$RCRC_{aj} = RCRP_{aj} * TRC_j$$

3.56.2 In respect of each Settlement Day, for each Party p, the Daily Party Residual Settlement Cashflow shall be determined as:

$$RCRC_p = \Sigma_j \Sigma_{a \in p} RCRC_{aj}$$

where Σ_j represents the sum over all Settlement Periods and $\Sigma_{a \in p}$ represents the sum over the Energy Accounts of Party p.

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[11] Given the definition of $CSOBM_j$ in 3.52.1, this actually simplifies to $TRC_j = TCII_j + TCEI_j$

3.57 Aggregate Charges and Payments

3.57.1 The SAA shall store calculated payments by Settlement Day, Settlement Run, Settlement Period, charge type and BM Unit for 7 (seven) years.

3.57.2 The SAA shall aggregate charges and payments by BSC Trading Party, Settlement Day and charge type and report to BSC Trading Parties and to the FAA in accordance with Section N 6.1.2 of the Code.

Such aggregation and reporting may include BSCCo Administration Charges.

3.57.3 To calculate the account charges the SAA shall aggregate for each BSC Trading Party across each Settlement Day:

- Daily Party BM Unit Cashflow;

- Daily Party Residual Settlement Cashflow;

- Daily Party Energy Imbalance Cashflow;

- System Operator BM charges;

- Administration charges;

- BM Unit Period Non-Delivery Charge, and

- Information Imbalance Charges.

And then calculate the Total Account Charge/Payment which aggregates the net cashflows above for each BSC Trading Party only, and adds to this the Account Energy Imbalance Charge/Payment. This results in a net credit or debit by Energy Account by Settlement Day for reporting purposes only.

For the avoidance of doubt: in relation to any Reconciliation Settlement Run, the amounts referred to in paragraphs N 6.1.3 and 6.1.4 of the Code are to be determined as though it were the first Settlement Run to be carried out in relation to the relevant Settlement Day, and so disregarding any payments which may on any prior Payment Date have been paid or payable in respect of the relevant Settlement Day.

3.58 Frequency of Settlement Runs

In respect of each Settlement Day the SAA will carry out the following Settlement Runs:

- Interim Initial Settlement Run (no report to FAA);

- Initial Settlement Run;

- Three Reconciliation Settlement Runs;

- Final Reconciliation Settlement Run.

All in accordance with the Payment Calendar and the Settlement Calendar as agreed by BSCCo.

In addition, the SAA will be required to carry out re-runs, as necessary, where a Dispute has been raised and a re-run with revised data is required to resolve the Dispute.

3.59   Determination of Trading Unit Delivery Mode

3.59.1   For the purpose of calculating and reporting the Trading Unit Delivery Mode, in respect of each Settlement Period at each Settlement Run, a Trading Unit will be identified as either 'delivering' to the Total System or 'offtaking' from the Total System in respect of any Settlement Period. This is determined by aggregating the BM Unit Metered Volumes from each non-Supplier BM Unit and the Corrected Component volumes from each Supplier BM Unit in the Trading Unit to determine whether the Trading Unit was a net importer or net exporter.

Note that, by default, a BM Unit not comprising a Trading Unit with other BM Units shall be considered to be a 'Sole Trading Unit' for the purposes of these calculations. The Delivery Mode of such a Trading Unit shall therefore be determined using the Metered Volume of the single BM Unit comprising that Trading Unit.

3.59.2   The Trading Unit Export Volume will be determined as:

$$QTUE_{rj} = \Sigma_{(non\text{-}S)} \max(QM_{ij}, 0) + \Sigma_{N(AE)} \mid CORC_{iNj} \mid$$

where:

$\Sigma_{(non\text{-}S)}$ represents the sum over all BM Units other than Supplier BM Units belonging to the Trading Unit; and

$\Sigma_{N(AE)}$ represents the sum over all Consumption Component Classes that are associated with active export over all Supplier BM Units belonging to the Trading Unit.

3.59.3   The Trading Unit Import Volume will be determined as:

$$QTUI_{rj} = \Sigma_{(non\text{-}S)} \min(QM_{ij}, 0) - \Sigma_{N(AI)} \mid CORC_{iNj} \mid$$

where:

$\Sigma_{(non\text{-}S)}$ represents the sum over all BM Units other than Supplier BM Units belonging to the Trading Unit; and

$\Sigma_{N(AI)}$ represents the sum over all Consumption Component Classes that are associated with active import over all Supplier BM Units belonging to the Trading Unit.

3.59.4   The Trading Unit Delivery Mode will be determined as

"Delivering" if $QTUE_{rj} + QTUI_{rj} > 0$; or

"Offtaking" if $QTUE_{rj} + QTUI_{rj} \leq 0$.

4.   REPORTING

4.1   Settlement Reports

4.1.1   As information (metered volumes from the CDCA, volumes from the SVAA, etc) becomes available, interim reports will be produced by the SAA and distributed in the same way as the Initial Settlement Report described below. Early release of Settlement information will allow Disputes to be raised before the Initial Settlement Run and associated cash flows.

4.1.2   The SAA shall produce the Initial Settlement Report in accordance with the Settlement Calendar and send it to BSC Trading Parties and to the FAA for payments to be made on the Initial Payment Date determined by the Payment Calendar. The provision of such data shall be in accordance with BSC Section T paragraph 5.3.1.

In carrying out any Reconciliation Settlement Run, the SAA shall:

a.   use data submitted by the CDCA and SVAA pursuant to the corresponding Reconciliation Volume Allocation Runs;

b.   make any adjustment or revision to any data submitted by the NETSO which is to be made following the resolution of any Trading Dispute, and use such adjusted or revised data;

c.   use any adjusted or revised data submitted to it for the relevant Settlement Period by the CRA, the CDCA, the ECVAA, any Market Data Index Provider, the NETSO and any Interconnector Administrator;

d.   should the NETSO submit any revised Balancing Services Adjustment Data, use such revised data.

The NETSO may resubmit to the SAA, the Balancing Services Adjustment Data in respect of any Settlement Period within the Settlement Day at any time prior to the Final Reconciliation Settlement Run for such Settlement Day, and the SAA shall correct such data in the Settlement Run next following such resubmission.

4.1.3   The SAA shall issue Settlement Reports in accordance with the Settlement Calendar as follows:

- Interim Initial Settlement Reports;

- Initial Settlement Reports;

- Reconciliation Settlement Reports (for 3 Reconciliation Settlement Runs as per Settlement Calendar);

- Final Reconciliation Settlement Report (Final Reconciliation Settlement Run as per Settlement Calendar).

Post-Final Settlement Runs shall be undertaken as required by BSCCo up to at least 28 months after the relevant Settlement Day and the SAA shall issue accompanying Settlement Reports in support of such runs.

In the event of a Manifest Error Claim being upheld, the SAA shall:

- receive replacement prices from the BSCCo Disputes Administrator via a signed form F14/05 'Instruction to Resolve Manifest Error';

- within 1 Working Day of receipt complete the form in order to confirm to the Disputes Administrator that the Initial Settlement Data appropriate to the Manifest Error has been, or will be, recalculated using these replacement prices;

- reissue the Initial Settlement Report appropriate to the Manifest Error

A copy of the NETSO's sub-flow of the Settlement Reports must be made available to any BSC Party to download from the NETA ftp site upon request, for a period of at least seven calendar days, in a manner that ensures that data is secure[12].

4.1.4 Before each Reconciliation Payment Date, a Reconciliation Settlement Report listing revised energy imbalances must be produced.

4.1.5 The SAA shall also produce the SAA Performance Report for BSCCo in accordance with the Section V, Table 2 of the Code.

4.1.6 The SAA shall also send a copy of the NETSO's sub-flow of the Settlement Report (see 4.1.3 above) to the EMR Settlement Services Provider for each Settlement Run.

4.2 Other Reporting

4.2.1 The SAA shall supply Credits and Debits Reports as follows:

a) a Report to the ECVAA after the Interim Initial Run;

b) a Report to the FAA after the Initial Settlement (SF) Run; and

c) revised Reports to the FAA resulting from timetabled and Post-Final Settlement Runs.

4.2.2 The SAA shall supply reports to BSCCo and BSC Trading Parties.

4.2.3 The SAA shall supply ad hoc reports to BSCCo or BSC Parties as requested in accordance with Schedule 2. All reports shall be as detailed in Section V, Table 2 of the Code (SAA Reporting).

4.2.4 Data Exception Reports shall be issued to the NETSO, Interconnector Administrators, the SVAA or the ECVAA, whichever is relevant. In addition, Data Exception Reports (for any recipient) shall, if requested, be copied and supplied to BSCCo.

4.2.5 SAA Performance Reports shall be issued monthly to BSCCo.

4.2.6 The SAA Performance Report shall include the performance details of each Market Index Data Provider described in 2.1A.4.

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[12] Secure in this case means a compressed but not encrypted file made available from a private area on the NETA ftp site.

4.2.7 The SAA shall report to the CRA the date of the last non-zero metered volumes, as part of the Withdrawals Checklist for a Withdrawing Party.

4.2.8 The SAA shall, on the 15th working day of each month, send Section D Charging information to the BSCCo. The data used shall be the latest available from the Interim Initial Settlement Run and the Initial Settlement Run only.

5. OTHER RESPONSIBILITIES

5.1 Disputes Process

5.1.1 The SAA shall provide services in respect of any Disputes in operation under the BSC in accordance with the provisions of Schedule 3, Part B.

5.1.2 A Dispute may be raised by a BSC Trading Party, the NETSO or by BSCCo if they object to the results of a Settlement when they believe that the calculation has been undertaken using the wrong data or the calculation does not follow the rules. The SAA may raise a Dispute on behalf of BSC Trading Parties if errors in calculations or data are detected or suspected.

5.1.3 The SAA shall, when requested by BSCCo, undertake evaluation, or analysis if requested, of a Dispute to determine the facts and its materiality.

5.1.4 The SAA shall, when requested by BSCCo submit written evidence concerning a particular Dispute, to the BSC Panel.

5.1.5 The SAA shall, when requested by the Customer, carry out a re-run of the Settlement process where a Dispute has been resolved between BSC Trading Parties or the BSC Panel have decided the outcome. Due to the CADL$_d$ procedure, any Disputes that pertain to a Settlement Day may require additional Settlement Period data from either side of the Day in question.

5.1.6 The SAA shall retain Settlement data:

    a. up to at least 28 months after the relevant Settlement Day for use in a Settlement Run; and

    b. thereafter, until 40 months after the relevant Settlement Day, in a form that may be retrieved, if requested, within 10 Business days, for use in an Extra-Settlement Determination.

5.1.7 The SAA shall submit the output from the re-runs detailed at 5.1.5 to the FAA.

5.1.8 SAA shall notify BSCCo promptly if it becomes aware of any matter which would or might reasonably be expected to give rise to a Trading Dispute.

5.1.9 The SAA shall, when requested by the Customer, carry out a Historic Settlement Run in order to regenerate Settlement Reports (e.g. in the case of non-delivery) using the data that was valid at the time of the production of the original report.

5.2 Settlement Calendar

5.2.1 For each BSC Year a Payment Calendar, setting out Payment Dates and Notification Dates in relation to each Settlement Day, will be established pursuant to Section N3 of the Code. The Payment Calendar will be developed by the FAA in consultation with the SAA under Section N3.1.1(a).

The SAA shall, following receipt from the FAA of the Payment Calendar under Section N3.3.2 and in consultation with BSCCo, prepare in accordance with BSCP301 and deliver to BSCCo, each other Party and each other BSC Agent, a Settlement Calendar showing, for the next following BSC Year:

a) the date upon which, for each Settlement Day in the BSC Year, the Interim Initial Settlement Run, the Initial Settlement Run and each of the Timetabled Reconciliation Settlement Runs are to be carried out;

b) the date upon which each of the corresponding Volume Allocation Runs, and the Credit Cover Volume Allocation Run are to be carried out and the resulting data delivered to the SAA and/or other BSC Agents.

The Settlement Calendar shall be consistent with the Payment Calendar.

5.3 Manage Settlement Registration Data

5.3.1 The SAA will receive from the CRA BM Unit and Energy Account registration data and Authentication details of the BSC Party. The SAA shall use this data for Settlement calculations.

5.3.2 The SAA shall retain all information received from the CRA as historical registration information sufficient to support re-runs of the Settlement Runs and analysis of any archived data.

5.3.3 The SAA shall receive Demand Capacity (DC_{ij}) from the CRA.

5.4 FAA Data Validation

5.4.1 Upon receipt of a Credits and Debits Report for an Initial, Reconciliation or Post Settlement Run; the FAA will validate the Settlement Results for completeness against Standing Data and for balance between total debits and total credits. In the event that the data fails this validation, the FAA will, by close of business on the Notification Date, send a Notification of Invalidity to the SAA and the BSCCo.

5.4.2 If a Notification of Invalidity is not received by close of business on the Notification date, the SAA will assume that the data have passed the validation checks.

5.4.3 Upon receipt of a Notification of Invalidity, the SAA will use its best endeavours to resolve the problem and to send revised Settlement Results to the FAA in time for scheduled FTS processing.

[P367]5.5   SBR Data Validation

5.5.1   For Settlement Periods in which SBR was provided, the SAA shall compare the SBP produced by SAA systems with the SBR Energy Imbalance Price provided by BSCCo.

5.5.2   The SAA shall notify BSCCo of the results of this comparison. Where there is a discrepancy, if the discrepancy is £10 per MWh or more different then the SAA shall **not** publish the price and shall await further instructions. And where the discrepancy is less than £10 per MWh the SAA shall publish the price and await further instructions.

6.   HANDLING OF MISSING OR INVALID SETTLEMENT DATA

6.1   Settlement Run Checks

6.1.1   For all run types where missing or invalid data is identified by the SAA, according to the checks specified in Appendix B, the SAA shall contact BSCCo and notify them of the details of pre-settlement run validation failures and await further instructions.

6.1.2   Following the notification of a pre-settlement run validation failure, the SAA shall receive a decision from BSCCo to either defer the run or use substitute data.

6.1.3   SAA shall receive from BSCCo instructions on how to progress a settlement run that the SAA has deferred following notification of pre-settlement run validation failures.

6.2   Checks at Interim Initial Settlement Run

6.2.1   When incomplete data is submitted for an Interim Initial Settlement Run, section T1.4.2 of the BSC states that the SAA should form an opinion on whether the proportion of data missing is 'significant', and whether the missing data is likely to be received by the end of the next Business Day, before seeking instructions from BSCCo. In practice, however, both BSCCo and the SAA prefer that BSCCo should take the lead in reaching decisions on these issues. For this reason, the SAA informs BSCCo of missing or invalid data in all cases.

6.3   Checks at Initial Settlement Runs

6.3.1   When incomplete data is submitted for an Initial Settlement Run, Section T1.4.5 of the BSC states that the SAA should form an opinion on whether the data is 'substantially complete' before seeking instructions from BSCCo. In practice, however, both BSCCo and the SAA prefer that BSCCo should take the lead in reaching decisions on these issues. For this reason, the SAA will inform BSCCo of missing or invalid data in all cases.

7.   CONTINGENCY PROVISIONS

7.1   Single Imbalance Price

In the event that an emergency situation arises where BSCCo is required to enact the contingency provision of a single imbalance price, the SAA shall work with BSCCo to develop a process which will support the use of such a price in its calculations.

Appendix A – Input Output Flows

[P367]A1. SAA Inputs

Input Flow Description	Flow Received From
BSC Party and BSC Party Agent Authentication details	CRA
Payment Calendar	FAA
Balancing Mechanism Data	BMRA (originally from NETSO)
BM Unit Metered Volumes	CDCA
Interconnector Meter Flow	CDCA
GSP Group Take	CDCA
Deemed Metered Amounts for an Interconnector User	Interconnector Administrator
Account Bilateral Contract Volume	ECVAA
Metered Volume Reallocations for Settlement	ECVAA
BM Unit and Energy Account registration data	CRA
TLFs and proportion of losses allocated to BM Units in delivering Trading Units	CRA
BSCCo costs	BSCCo
Supplier Volume Allocations	SVAA
Dispute notification	BSC Party, NETSO, BSCCo
System Parameters	BSCCo
Balancing Services Adjustment Data (BSAD)	NETSO
Acceptance Data relating to Emergency Instruction[13]	NETSO
Authorisation to use amended BSAD in live Settlement Run[14]	BSCCo
BM Unit Applicable Balancing Services Volume	NETSO
Receive settlement run decision	BSCCo [15]
Receive settlement run instructions	BSCCo [16]
Receive form F14/05 'Instruction to resolve Manifest Error'	BSCCo (Disputes Secretary)
Receive Notification of Invalidity (of Credits and Debits Report)	FAA
Market Index Data Provider Registration Data	CRA
Market Index Data Provider Threshold Data	BSCCo
Market Index Data	Market Index Data Provider

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[13] Authorisation from BSCCo is to be sought prior to inputting this data into the SAA database.
[14] This applies where BSAD has been amended to achieve the desired Energy Imbalance Prices arising from an Excluded Emergency Acceptance.
[15] All instances of this flow must be initiated or confirmed by e-mail for auditability
[16] All instances of this flow must be initiated or confirmed by e-mail for auditability

Input Flow Description	Flow Received From
BM Unit SVA Gross Demand	SVAA
~~Calculated SBR Imbalance Price~~	~~BSCCo~~
Corrected Component volumes	SVAA

[P367]A2.   SAA Outputs

Output Flow Description	Flow Sent To
Settlement Calendar	All BSC Parties and BSCCo
Initial Credits/Debits	FAA, ECVAA
Credits/Debits (revised)	FAA
Settlement Reports (Scheduled)	BSC Trading Party
Settlement Reports (Requested)	BSC Party
Settlement Reports (Summarised)	BSCCo
Settlement Reports (NETSO)	NETSO
Settlement Reports (Scheduled)	EMR Settlement Services Provider
Data Exception Reports	NETSO, IA, SVAA or EVCAA as required.
Performance Reports	BSCCo
Dispute details	BSC Party, BSCCo, NETSO
Completed form F14/05 'Instruction to Resolve Manifest Error'	BSCCo (Disputes Secretary)
Settlement Calendar	CDCA
Report pre-settlement run validation failure	BSCCo [17]
Withdrawing Party Settlement Details	CRA
Confirmation that amendments to BSAD have generated the desired Energy Imbalance Prices relating to an Excluded Emergency Acceptance	BSCCo
BSC Section D Charging Data	BSCCo
BM Unit Gross Demand	CFD Settlement Services Provider
~~SBR Imbalance Price Discrepancy Notice~~	~~BSCCo~~
Trading Unit Data	BMRA

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[17] All instances of this flow must be initiated or confirmed by e-mail for auditability

Appendix B – Settlement Run Checks

[P367]B1.   Checks at Interim Initial Settlement Runs

	Detecting Missing or Invalid Data	**Action**
Final Physical Notification (FPN) Data	Check that FPN data has been provided for all BM Units with the FPN Flag set, or Bid Offer data provided.	Where this is not the case, SAA will notify BSCCo and where required, default data will be agreed and processed at SAA. Note that workaround W018 (and any enduring solution) allows NGC to provide manual corrections and additions to BM data, post the II run. In most cases this workaround would be used as the means of providing missing FPN data.
Balancing Services Adjustment Data	Check that data has been explicitly provided and successfully loaded, prior to initiating run.	Where this is not the case, SAA will notify BSCCo and default data will be agreed and processed at SAA. Day-ahead files may be used if available, otherwise the system will default to zero values. (The intention of this check is to give BSCCo the opportunity to override the system default.)
Bid – Offer Data	Check that Bid / Offer data has been provided for all settlement periods for any BM Unit with a Bid Offer Acceptance.	Where this is not the case, SAA will notify BSCCo and default data will be agreed and processed at SAA. Note that workaround W018 (and any enduring solution) allows NGC to provide manual corrections and additions to BM data, post the II run. In most cases this workaround would be used as the means of providing missing Bid – Offer data.
Interconnector User BM Unit Metered Volumes	Check that Interconnector User BM Unit Metered Volumes have been received for each Interconnector.	Where this is not the case, SAA will notify BSCCo and default data will be agreed and processed at SAA.
Account Bilateral Contract Volumes, Metered Volume Reallocation Data	Check that Account Bilateral Contract Volumes and Metered Volume Reallocation Data have been received from ECVAA system.	Where this is not the case, SAA will notify BSCCo and default data will be agreed and processed at SAA.

	Detecting Missing or Invalid Data	**Action**
Aggregated CDCA data, e.g.: CVA BM Unit Metered Volumes, GSP Group Takes, Interconnector Metered Volumes	Check that CDCA run has taken place. (CDCA and SAA share a common database, the results of the CDCA run will automatically be available to SAA, provided the aggregation run took place.)	Where this is not the case, SAA will notify BSCCo and default data will be agreed and processed at SAA.
SVA Metered Data	Check that BM Unit Allocated Demand Volume data has been received from SVAA.	Where this is not the case, SAA will notify BSCCo and default data will be agreed and processed at SAA.
SVA Metered Data	Check that the GSP Group Take for each GSP Group from CDCA matches the associated Aggregated Supplier Volume Allocation (accounting for tolerances).	Where this is not the case, then SAA will notify BSCCo and SVAA, and BSCCo will determine appropriate action.
SVA Metered Data	Check that the CDCA Run Number and Settlement Date received from CDCA matches the CDCA Run Number and Settlement Date received from SVAA.	Where this is not the case, then SAA will notify BSCCo and CDCA, and BSCCo will determine appropriate action.
SVA Metered Data	A BM Unit Identifier in the Supplier Volume Allocation is found, by SAA, to be invalid.	SAA, by default, adds the metered volume for the invalid BM Unit into the Base BM Unit for the Supplier in the relevant GSP Group. SAA should notify BSCCo that it has undertaken this defaulting. BSCCo will determine appropriate action and notify SAA.
SVA Metered Data	A BM Unit Identifier in the Supplier Volume Allocation is found, by SAA, to be missing (on the basis that there are no associated SVA Metering Systems and no data is submitted as a result).	SAA, by default, provides a zero metered volume for the missing BM Unit for the Supplier in the relevant GSP Group. SAA should notify BSCCo that it has undertaken this defaulting in time for BSCCo to instruct SAA otherwise, if deemed appropriate by BSCCo.
Market Index Data	Check that all data is present for the relevant post-P78 Settlement Days	Where this is not the case, SAA will notify BSCCo and default data will be agreed and processed at SAA.

	Detecting Missing or Invalid Data	**Action**
~~SBR Data~~	~~Check that the SAA generated SBP is equal to the BSCCo Calculated SBR Imbalance Price~~	~~SAA will notify BSCCo of the results and where there is a discrepancy will await further instruction.~~

[P367]B2.   Checks at Initial Settlement and Reconciliation Runs

Inbound Data Flow	**Detecting Missing or Invalid Data**	**Action**
Final Physical Notification (FPN) Data	Check that FPN data has been provided for all BM Units with the FPN Flag set, or Bid Offer data provided.	Where this is not the case, SAA will notify BSCCo and where required, default data will be agreed and processed at SAA. Note that workaround W018 (and any enduring solution) allows NGC to provide manual corrections and additions to BM data. In most cases this workaround would be used as the means of providing missing FPN data.
Balancing Services Adjustment Data	Check that data has been explicitly provided and successfully loaded, prior to initiating run.	Where this is not the case, SAA will notify BSCCo and default data will be agreed and processed at SAA. Day-ahead files may be used if available, otherwise the system will default to zero values. (The intention of this check is to give BSCCo the opportunity to override this system default.)
Bid - Offer Data	Check that Bid / Offer data has been provided for all settlement periods for any BM Unit with a Bid Offer Acceptance.	Where this is not the case, SAA will notify BSCCo and default data will be agreed and processed at SAA. Note that workaround W018 (and any enduring solution) allows NGC to provide manual corrections and additions to BM data. In most cases this workaround would be used as the means of providing missing Bid - Offer data.
Interconnector User BM Unit Metered Volumes	Check that Interconnector User BM Unit Metered Volumes have been received for each Interconnector.	Where this is not the case, SAA will notify BSCCo and default data will be agreed and processed at SAA.

Inbound Data Flow	Detecting Missing or Invalid Data	Action
Account Bilateral Contract Volumes, Metered Volume Reallocation Data	Check that Account Bilateral Contract Volumes and Metered Volume Reallocation Data have been received from ECVAA system.	Where this is not the case, SAA will notify BSCCo and default data will be agreed and processed at SAA.
Aggregated CDCA data, e.g.: CVA BM Unit Metered Volumes, GSP Group Takes, Interconnector Metered Volumes	Check that CDCA run has taken place. (CDCA and SAA share a common database, the results of the CDCA run will automatically be available to SAA, provided the aggregation run took place.)	Where this is not the case, SAA will notify BSCCo and default data will be agreed and processed at SAA.
SVA Metered Data	Check that BM Unit Allocated Demand Volume data has been received from SVAA.	Where this is not the case, SAA will notify BSCCo and default data will be agreed and processed at SAA.
SVA Metered Data	Check that the GSP Group Take for each GSP Group from CDCA matches the associated Aggregated Supplier Volume Allocation (accounting for tolerances).	Where this is not the case, then SAA will notify BSCCo and SVAA, and BSCCo will determine appropriate action.
SVA Metered Data	Check that the CDCA Run Number and Settlement Date received from CDCA matches the CDCA Run Number and Settlement Date received from SVAA.	Where this is not the case, then SAA will notify BSCCo and CDCA, and BSCCo will determine appropriate action.
SVA Metered Data	A BM Unit Identifier in the Supplier Volume Allocation is found, by SAA, to be invalid.	SAA, by default, adds the metered volume for the invalid BM Unit into the Base BM Unit for the Supplier in the relevant GSP Group. SAA should notify BSCCo that it has undertaken this defaulting. BSCCo will determine appropriate action and notify SAA.

Inbound Data Flow	Detecting Missing or Invalid Data	Action
SVA Metered Data	A BM Unit Identifier in the Supplier Volume Allocation is found, by SAA, to be missing (on the basis that there are no associated SVA Metering Systems and no data is submitted as a result).	SAA, by default, provides a zero metered volume for the missing BM Unit for the Supplier in the relevant GSP Group. SAA should notify BSCCo that it has undertaken this defaulting in time for BSCCo to instruct SAA otherwise, if deemed appropriate by BSCCo.
Market Index Data	Check that all data is present for the relevant post-P78 Settlement Days	Where this is not the case, SAA will notify BSCCo and default data will be agreed and processed at SAA.
~~SBR Data~~	~~Check that the SAA generated SBP is equal to the BSCCo Calculated SBR Imbalance Price~~	~~SAA will notify BSCCo of the results and where there is a discrepancy will await further instruction.~~

B3. Daily Check of Balancing Services Data

Inbound Data Flow	Detecting Missing or Invalid Data	Action
Bid – Offer Acceptances	Check the File Sequence Numbers for potential out-of-sequence files, indicating missing Acceptance data.	Where missing data is indicated, SAA will notify BSCCo and default data will be agreed and processed at SAA. Note that workaround W018 (and any enduring solution) allows NGC to provide manual corrections and additions to BM data, post II run. In most cases this workaround would be used as the means of providing missing Bid - Offer Acceptance data. Missing data should be provided within 2 days, otherwise the matter will be escalated further.
BM Unit Applicable Balancing Services Volume Data	Check there are no missing files.	Where this is not the case, SAA will notify BSCCo and default data will be agreed and processed at SAA.

Appendix C - Price Derivation Codes

Code	Description	NIV	∑QXP	Condition Detail
A	SBP = Main price; SSP = Reverse Price	Positive	Non Zero	− SBP = NIV; − SSP = MP$_j$; − Final Priced Volume on Stack is not zero; − SSP is not greater than SBP
B	SSP Capped to SBP	Positive	Non Zero	− SBP = NIV; − SSP = NIV; − Final Priced Volume on Stack is not zero; − SSP is greater than SBP
C	SSP Defaulted to SBP	Positive	Zero	− SBP = NIV; − SSP = NIV; − Final Priced Volume on Stack is not zero; − QXP is zero
D[18]	SBP & SSP Defaulted to Market Price	Positive	Non Zero	− SBP = MP$_j$; − SSP = MP$_j$; − Final Priced Volume on Stack is zero; − QXP is not zero
E[1818]	SSP & SBP Defaulted to Zero	Positive	Zero	− SBP = 0; − SSP = 0; − Final Priced Volume on Stack is zero; − QXP is zero
F	SSP = Main Price; SBP = Reverse Price	Negative	Non Zero	− SBP = MP$_j$; − SSP = NIV; − Final Priced Volume on Stack is not zero; − SSP is not greater than SBP
G	SBP Capped to SSP	Negative	Non Zero	− SBP = NIV; − SSP = NIV; − Final Priced Volume on Stack is not zero; − SSP is greater than SBP

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[18] Price Derivation Codes D, E, I and J only relate to Settlement Days prior to the P217 effective date.

Code	Description	NIV	∑QXP	Condition Detail
H	SBP Defaulted to SSP	Negative	Zero	− SBP = NIV; − SSP = NIV; − Final Priced Volume on Stack is not zero − QXP is zero
I~~18~~18	SBP & SSP Defaulted to Market Price	Negative	Non Zero	− SBP = MP_j; − SSP = MP_j; − Final Priced Volume on Stack is zero; − QXP is not zero
J~~18~~18	SSP & SBP Defaulted to Zero	Negative	Zero	− SBP = 0; − SSP = 0; − Final Priced Volume on Stack is zero; − QXP is zero
K	SSP & SBP Defaulted to Market Price	Zero	Non zero	− SBP = MP_j; − SSP = MP_j
L	SSP & SBP Defaulted to Zero	Zero	Zero	− SBP = 0; − SSP = 0
N	SSP Defaulted to Main Price; SBP = SSP	Negative	Any	− NIV is Negative
P	SBP Defaulted to Main Price, SSP = SBP	Positive	Any	− NIV is Positive