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INITIAL WRITTEN ASSESSMENT OF MODIFICATION PROPOSAL P27 -Amendment to the Derivation of Imbalance Prices

Prepared by ELEXON Limited

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Each BSC Agent	Various
The Gas and Electricity Markets Authority	Ofgem
Each BSC Panel Member	Various
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Core Industry Document Owners	Various

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II CONTENTS TABLE

l a b c	Document Control Authorities Distribution Intellectual Property Rights and Copyright	2 2 2 2
п	Contents Table	3
1	Summary	4
2	Introduction	5
3	Purpose and Scope of the Report	6
4	Description of the Modification Proposal	7
5	Impact on BSC Systems and Processes	8
6	Impact on Other Systems and Processes Used by Parties	9
7 7.1 7.2 7.3	Impact on Documentation 10 Impact on Balancing and Settlement Code 10 Impact on Code Subsidiary Documents 11 Impact on Core Industry Documents 11	D 2 3
8	Impact on Other Configurable Items14	4
9	Impact on ELEXON1	5
10	Impact on Financial Arrangements and Budget10	6
11	Impact on BSC Agent Contractual Arrangements1	7
12	Process and Timetable for Progressing the Proposal18	8
13	Issues19	9
Annex 1 –	Modification Proposal	0

1 SUMMARY

Modification P27 proposes an amendment to the derivation of imbalance prices. The central aspect of the proposal is a change to the pricing of Trading Parties' individual imbalances that are in the opposite direction to the aggregate imbalance of the system as a whole. Thus, it is proposed that, as now:

- (i) when the system overall is short, a Trading Party who is short will pay the System Buy Price; and
- (ii) when the system overall is long, a Trading Party who is long will paid¹ the System Sell Price.

However, under the proposal,

- (iii) when the system overall is short, a Trading Party who is long will be paid the System Buy Price less an offset price that is derived by comparing the price of certain System Operator balancing actions and a "Market Price"; and
- (iv) when the system overall is long, a Trading Party who is short will pay the System Sell Price plus an offset price.

The Market Price is derived from publicly-traded forward markets.

An initial assessment of Modification Proposal P27 has identified the following potential issues to be considered:

- consistency with the BSC objectives and, in particular, whether the change to the imbalance price calculation will assist in "promoting effective competition in the generation and supply of electricity, and (so far as consistent therewith) promoting such competition in the sale and purchase (as defined in the Transmission Licence) of electricity";
- the adequacy of publicly traded markets in providing a Market Price
- the availability of a suitable Market Price in near real-time
- the effect of arbitrage and constraint-related balancing mechanism actions
- possible effects on prices of Offers and Bids in the Balancing Mechanism, and consequential effects on the System Buy Price or System Sell Price as the case may be
- possible interaction with other proposed Modifications

It is recommended that the Modification Proposal be progressed through the Assessment Phase with an Assessment Report to be presented to the BSC Panel in October.

¹ Assuming prices are positive.

2 INTRODUCTION

This Report has been prepared by ELEXON Ltd. on behalf of the Balancing and Settlement Code Panel ('the Panel'), in accordance with the terms of the Balancing and Settlement Code ('BSC'). The BSC is the legal document containing the rules of the balancing mechanism and imbalance settlement process and related governance provisions. ELEXON is the company that performs the role and functions of the BSCCo, as defined in the BSC.

An electronic copy of this document can be found on the BSC website, at www.elexon.co.uk

3 PURPOSE AND SCOPE OF THE REPORT

Section F of the BSC sets out the procedures for progressing proposals to amend the BSC (known as 'Modification Proposals'. These include procedures for proposing, consulting on, developing, evaluating and reporting to the Authority on potential modifications.

The BSC Panel is charged with supervising and implementing the modification procedures. ELEXON provides the secretariat and other advice, support and resource required by the Panel for this purpose. In addition, if a modification to the Code is approved or directed by the Authority, ELEXON is responsible for overseeing the implementation of that amendment (including any consequential changes to systems, procedures and documentation).

When a new proposal to modify the BSC is made, it is the responsibility of the Panel to determine how it should be progressed. Options include submitting the proposal to a Definition Procedure², submitting it to an Assessment Procedure³, amalgamating the proposal with another proposal⁴, or proceeding directly to the Report Phase⁵. With a view to assisting the Panel in taking this decision, ELEXON prepares this initial written assessment of the implications of the Modification Proposal as soon as reasonably practicable after the proposal is made⁶. ELEXON endeavours to complete this initial assessment such that it can be reviewed by the Panel at the Panel meeting at which the relevant Modification Proposal is first to be considered.

This initial assessment provides a preliminary view on the following:

- the potential impact of the proposed modification on BSC systems and processes;
- the potential impact of the proposed modification on other systems and processes used by Parties;
- the potential impact of the proposed modification on the BSC, Code Subsidiary Documents and Core Industry Documents;
- the potential impact of the proposed modification on ELEXON;
- the potential impact of the proposed modification on BSC financial arrangements and budget;
- the potential impact of the proposed modification on BSC Agent contractual arrangements;
- The process and timetable that should be adopted for the progression of the Modification Proposal, in light of its complexity, importance and urgency; and
- Issues that will need to be considered and addressed in progressing the Modification Proposal (including the potential need for impact assessments, consultation and analyses).

It should be noted that, as this document only represents a preliminary assessment of the Modification Proposal, the information contained herein will, in most cases, be superseded by the subsequent analysis and reports produced by the Modification Group to which the Panel assigns the proposal for consideration.

² see BSC F2.5

³ see BSC F2.6

⁴ see BSC F2.3

⁵ see BSC F2.7

⁶ see BSC F2.1.8

4 DESCRIPTION OF THE MODIFICATION PROPOSAL

The proposed modification proposes an amendment to the derivation of imbalance prices. It is argued that the spread in Energy Imbalance prices is not justified by costs imposed by imbalances on the System and, in particular, that

- (a) when the system is long, i.e. Trading Parties are, in aggregate, spilling on to the system and the Transmission Company is thus accepting Bids to buy energy, then the present System Buy Price charged on Parties that are short does not reflect the costs imposed; and
- (b) when the system is short, i.e. Trading Parties are, in aggregate, topping-up from the system and the Transmission Company is thus taking Offers to sell energy, then the present System Sell Price paid to Parties that are long does not reflect the costs imposed.

In addition to the Modification Proposal, included in Annex 1, the proposer has drafted detailed algebra describing the proposal. This algebra has been included as Annex 2.

The proposal determines the price of System Operator balancing actions that are in the reverse direction to the overall direction of System Operator balancing actions, i.e. the price of accepted Offers in the case that the System is long and the System Operator is generally accepting Bids, or of accepted Bids in the case that the System is short and the System Operator is generally accepting Offers. The proposal then calculates:

- a "Difference Value", as being the difference between the price associated with these "reverse flows" and the price of purchasing (or selling) in the forwards markets at the "Market Price"; and
- (ii) a "Reverse-flow Imbalance Cost" as being the cost of (or revenue from) the reverse flows when compared to the cost from purchasing (or revenue from selling) the same volume in the forwards markets at the Market Price.

The Reverse-flow Imbalance Cost is then allocated to Trading Parties on the basis of their Account Energy Imbalance Volumes where these are of the opposite sign to the total imbalance of the System as a whole. Thus, when the System is long, the Reverse-flow Imbalance Cost (which will have been calculated from the cost of accepted Offers) will be pro-rated on the Account Energy Imbalance volumes of Trading Parties that are short, and when the System is short, the Reverse-flow Imbalance Cost (which will have been calculated from the accepted Bids) will be pro-rated on the Account Energy Imbalance Imbalance Cost (which will have been calculated from the accepted Bids) will be pro-rated on the Account Energy Imbalance Imbalance volumes of Trading Parties that are long.

5 IMPACT ON BSC SYSTEMS AND PROCESSES

BSC System / Process	Potential Impact of Proposed Modification
Registration	Details of source or Market Price data may need to be held by Central Registration Agent
Contract Notification	None
Credit Checking	Conditional on other Modifications (e.g. P2) there may be a need for ECVAA to either obtain Difference Prices from BMRA or SAA in order to calculate indebtedness for credit checking purposes
Balancing Mechanism Activities	None
Collection and Aggregation of Metered Data	None
Supplier Volume Allocation	None
Settlement	New Difference Price calculation with consequential changes to Energy Imbalance and residual cashflows (including input of new market price data)
Clearing, Invoicing and Payment	None
Reporting	 Balancing Mechanism Report Agent will need to receive near real-time Market Price data and compute and display the Difference Price accordingly. N.B. It needs to be established (and displayed) whether, at any given time, the System Buy Price is being determined from the System Sell Price plus the Difference Price, or whether the System Sell Price is determined from the System Buy Price less the Difference Price. This requires the net of all Account Energy Imbalances; whilst individual Account Energy Imbalances cannot be established until metered data is available, this net quantity can be determined from the net of Accepted Offers and Bids. Thus, this information is available to the BMRA within the required timescales.
Contingencies	None. (The proposal incorporates a default in the event of Market Price data being unavailable.)
Dispute Resolution	None

6 IMPACT ON OTHER SYSTEMS AND PROCESSES USED BY PARTIES

System / Process	Potential Impact of Proposed Modification
Energy Trading Systems	Trading Parties' Energy Trading Systems may need to be revised to take into account the changes to imbalance cash-out exposure which may be reflected in changes to the management of energy imbalance volume exposure.
Source of Market Price	It needs to be established whether the Designated market is able to provide Market Price information to the Balancing Mechanism Reporting Agent shortly after the end of the Settlement Period, i.e. just over four hours after Gate Closure when the market for the Settlement Period closes. This information will be required within these timescales such that the Difference Price can be displayed.
NGC Incentive Scheme	Potential effect on System Operator Incentive Scheme as a result of changes to the behaviour of imbalance prices.

7 IMPACT ON DOCUMENTATION

7.1 Impact on Balancing and Settlement Code

BSC Section	Potential Impact of Proposed Modification
A: Parties and Participation	None
B: The Panel	Panel required to Designate source of Market Price data.
C: BSCCo and its Subsidiaries	Possible changes required to BSCCo functions in procuring Market Price data.
D: BSC Cost Recovery and Participation Charges	None
E: BSC Agents	Possible requirement for a Market Price Provider as a new BSC Agent
F: Modification Procedures	None
G: Contingencies	None
H: General	None
I: Not Used	None
J: Party Agents	None
K: Classification and Registration of Metering Systems and BM Units	None
L: Metering	None
M: Credit Cover and Credit Default	Contingent on any Modification to credit checking, potential changes to the indebtedness calculation.
N: Clearing, Invoicing and Payment	None
O: Communications	None

BSC Section	Potential Impact of Proposed Modification
P: Energy Contract Volumes and Metered Volume Reallocations	None
Q: Balancing Mechanism Activities	None
R: Collection and Aggregation of Metered Data from CVA Metering Systems	None
S: Supplier Volume Allocation	None
S: ANNEX S-1 Performance Levels and Supplier Charges	None
S: ANNEX S-2 Supplier Volume Allocation Rules	None
T: Settlement and Trading Charges	Changes to pricing calculations and energy imbalance charges.
U: Provisions Relating to Settlement	None
V: Reporting	Possible changes for reporting of Difference Value and/or the applicable prices to positive and negative imbalances. Requirement to obtain Market Price data.
W: Trading Queries and Trading Disputes	None
X: Definitions and Interpretation	Inclusion of any consequential definitions
X: ANNEX X-1 General Glossary	Inclusion of any consequential definitions
X: ANNEX X-2 Technical Glossary	Inclusion of any consequential definitions

7.2 Impact on Code Subsidiary Documents

Code Subsidiary Document	Potential Impact of Proposed Modification
BSC Procedures	Possible requirement for a procedure for the receipt of Market Price data.
Codes of Practice	None
BSC Service Descriptions	None
Party Service Lines	None
Data Catalogues	Inclusion of new or modified items
Communication Requirements Documents	None
Reporting Catalogue	Inclusion of new or modified items

7.3 Impact on Core Industry Documents

Core Industry Document	Potential Impact of Proposed Modification
Grid Code	None
MCUSA	None
Supplemental Agreements	None
Ancillary Services Agreements	None
Master Registration Agreement	None
Data Transfer Services Agreement	None
British Grid Systems Agreement	None
Use of Interconnector Agreement	None
Pooling and Settlement Agreement	None
Settlement Agreement for Scotland	None
Distribution Codes	None
Distribution Use of System Agreements	None
Distribution Connection Agreements	None

8 IMPACT ON OTHER CONFIGURABLE ITEMS

Item	Potential Impact of Proposed Modification
Non identified at this stage	

9 IMPACT ON ELEXON

Area of Business	Potential Impact of Proposed Modification
ELEXON Systems	Changes in TOMAS to reflect changed settlements calculations
ELEXON Procedures	Potential changes to reflect support to new market price data handling
ELEXON Contracts (Excluding BSC Agent Contracts)	Agreement required with provider of Market Price data
Other (e.g. costs, staffing, etc.)	-

10 IMPACT ON FINANCIAL ARRANGEMENTS AND BUDGET

To be assessed.

11 IMPACT ON BSC AGENT CONTRACTUAL ARRANGEMENTS

BSC Agent Contract Potential Impact of Proposed Modification		
Logica (BMRA, CRA, CDCA, SAA, ECVAA, TAA(CVA))	New real-time feed of Market Prices plus additional algebra in the SAA.	
EPFAL (FAA)	None	
ESIS (TAA(SVA))	None	
Cap Gemini (SVAA)	None	
PwC (BSC Auditor, Certification Agent)	May be some additional audit costs in verifying Market Price data	
EASL (Teleswitch Agent, Profile Administrator)	None	

12 PROCESS AND TIMETABLE FOR PROGRESSING THE PROPOSAL

ELEXON recommends that this Modification Proposal be submitted to the Pricing Modification Group for Assessment. The Modification Group should be actioned to provide its report to the Panel on the 18 October 2001.

13 ISSUES

The following issues, inter alia, should be considered and addressed in progressing the Modification Proposal.

- consistency the BSC objectives and, in particular, whether the change to the imbalance price calculation will assist in "promoting effective competition in the generation and supply of electricity, and (so far as consistent therewith) promoting such competition in the sale and purchase (as defined in the Transmission Licence) of electricity";
- the adequacy of publicly traded markets in providing a Market Price;
- the technical feasibility of obtaining Market Price data in near real-time, the proposal requiring Market Price data to be made available to BMRS within just over four hours of Gate Closure which is soon after the Designated Market would close;
- identification of candidate 'Designated Markets';
- possible effects on prices of Offers and Bids in the Balancing Mechanism, and consequential effects on System Buy Price or System Sell Price.
- the effect on the Difference Value of arbitrage and constraint-related balancing mechanism actions;
- possible effects on prices of Offers and Bids in the Balancing Mechanism, and consequential effects on the System Buy Price or System Sell Price as the case may be;
- contractual issues in obtaining and publishing Market Price data;
- commercial effects on publicly-traded markets which are not Designated;
- possible interactions with other proposed Modifications.

ANNEX 1 – MODIFICATION PROPOSAL

Modification Proposal

MP No: 27 (mandatory by BSCCo)

Title of Modification Proposal (mandatory by proposer):

Amendment To The Derivation Of Imbalance Prices

Submission Date (mandatory by proposer): 26 June 2001

Description of Proposed Modification (mandatory by proposer):

Imbalance cash-out prices need to be amended to more closely reflect the costs that out-of-balance parties impose on the system. This should be based around a correct valuation both of net imbalance energy and of energy for reverse-flow imbalances. One potential method for doing this is offered as follows:

The Imbalance Cash-out Price for imbalances in the opposite direction to net system imbalances should be based on the imbalance price faced by those who are out out of balance in the direction of national imbalance but adjusted for the cost of managing such reverse-flow imbalances. The cost of managing reverse-flow imbalances is derived by applying a Difference Value to the reverse-flow volumes. This Difference Value represents the difference between the value of energy that the system operator could have bought or sold (as appropriate) in pre-gate closure markets and the cost or revenue derived from trading in the Balancing Mechanism. The value of energy against which the difference value is calculated will be derived from the prices at which electricity is traded for physical delivery in publicly traded electricity markets. The BSC Panel will Designate the Market or Markets to be used and will maintain a review of such Designation(s). If, at any time, the Panel decides that no publicly traded electricity market is suitable for Designation, then a default value of [5%] of the System Price derived for net system imbalances will be used as a difference price.

Calculation when the system is short:

When the system is short (NGC energy purchases exceed energy sales), the Primary Imbalance Price shall be System Buy Price. System Sell Price will be calculated using the appropriate methodology. In addition, a Market Price will be calculated for the purpose of calculating the Difference Value, which will be the higher of:

Market Price - System Sell Price, and

Zero.

Where there is no Market Price then the Difference Value will be SBP * [5%].

The Reverse-flow Imbalance Cost will be calculated as:

NGC Sales * Difference Value

The Reverse-flow Imbalance Cost will be shared out equally amongst all participants whose Credited Energy Volume exceeds their contract volume in proportion to their imbalance. However, there are potential de minimis perversities. Therefore, a Reverse-flow Unit Offset Price needs to be calculated as follows:

Reverse-flow Imbalance Cost/max(System Sell Volume, Imbalance party over-deliveries, BRL*)

Calculation when the system is long:

When NGC energy sales exceed energy purchases, the Primary Imbalance Price will be System Sell Price. The Difference Value will be the higher of:

System Buy Price - Market Price, and

Modification Proposal

MP No: 27

(mandatory by BSCCo)

Zero.

Or else will be [5%] of System Sell Price (if no Market Price is available). with the Reverse-flow Imbalance Cost calculated as:

NGC purchases * Difference Value

and will be shared out amongst the imbalances of those who are short, with Reverse-flow Init Offset Price calculated as:

Reverse-flow Imbalance Cost/max(System Buy Volume, Imbalance party under-deliveries, BRL*)

[* BRL or something similar is offered as a potential bottom-stop volume to avoid de minimis volumes.]

Description of Issue or Defect that Modification Proposal Seeks to Address (mandatory by proposer):

When the pricing mechanism was conceived, it was intended that parties who were out of balance should bear the full cost of resolving the imbalance. Implicit in this is an assumption of a connection between spot market prices and imbalance prices with the spot market being used by participants (and, potentially, NGC) to adjust their contract position in order to avoid imbalance. However, what was not envisaged was the scale of the buy-sell spread in the imbalance prices which has led to considerable over-recovery of those costs and to a misallocation of incentives to balance, distorting the value of managing balance to the ultimate detriment of competition in supply. Because the spread is not reflective of the relative costs of imbalances, it is potentially hampering the development of spot markets.

Because, unlike in the gas market, electricity cannot be managed within tradable tolerances (i.e. linepack), the ultimate cost of managing imbalances is derived from the net imbalance of the system. To this extent imbalances that are in the opposite direction to system imbalance actually reduce the net cost of imbalance management. The purpose of this proposal is to recognise this factor and to determine the cost of reverse-flow imbalances in terms of the opportunity cost of imbalance energy (ultimately derivable from traded markets) and to apply that cost to reverse flow imbalances.

Imbalances in the direction of system imbalances are more correctly calculated in that they apply the direct cost of managing their gross imbalances through system prices although it can still be argued that this is a potential over-recovery of costs given that NGC will only need to recover net imbalance costs from these parties.

Impact on Code (optional by proposer):

Section T, Section B

Impact on Core Industry Documents (optional by proposer):

Impact on BSC Systems and Other Relevant Systems and Processes Used by Parties (optional by proposer):

Impact on other Configurable Items (optional by proposer):

Justification for Proposed Modification with Reference to Applicable BSC Objectives (mandatory by proposer):

By more correctly allocating the cost of reverse-flow imbalances to those causing it rather than over-recovering

	Modification Proposal	MP No: 27 (mandatory by BSCCo)	
that cost, imbalance cash-flows are more efficiently allocated. This reduces distortions in cashflow allocations, which facilitates competition in generation and supply.			
Details of Proposer:			
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Attachments: NO If Yes, Title and No. of Pages of Each Attachment:			

ANNEX 2 – ALGEBRA FOR PROPOSED MODIFICATION

 MP_j is a **Market Price** for period j derived from markets designated by The Panel [need rules for designation of markets and for deriving the prices from them].

If $\{O_i O^n \{OAO^n_{ij} * TLM_{ij}\} + BVA_j\} > 0$ then:

 $\mathsf{ISBP}_{j} = \{ \acute{O}_{i}\acute{O}^{n} \{ \mathsf{QAO}^{n}_{ij} * \mathsf{PO}^{n}_{ij} * \mathsf{TLM}_{ij} \} + \mathsf{BCA}_{j} \} / \{ \acute{O}_{i}\acute{O}^{n} \{ \mathsf{QAO}^{n}_{ij} * \mathsf{TLM}_{ij} \} + \mathsf{BVA}_{j} \}$

Else ISBP_j is a default [calculated in the same way as for default SBP_j at present]

If $\{ \acute{O}_{i}\acute{O}^{n} \{ QAB^{n}_{ij} * TLM_{ij} \} + SVA_{j} \} < 0$ then:

 $\mathsf{ISSP}_{j} = \{ \acute{O}_{i}\acute{O}^{n} \{ \mathsf{QAB}^{n}_{ij} * \mathsf{PB}^{n}_{ij} * \mathsf{TLM}_{ij} \} + \mathsf{SCA}_{j} \} / \{ \acute{O}_{i}\acute{O}^{n} \{ \mathsf{QAB}^{n}_{ij} * \mathsf{TLM}_{ij} \} + \mathsf{SVA}_{j} \}$

Else ISSP_i is a default [calculated in the same way as for default SSP_i at present]

where:

ISBP_j is System Operator Average Price Of Purchases ISSP_j is System Operator Average Price Of Sales

System is short where:

{
$$\dot{O}_{i}\dot{O}^{n}$$
{ QAO^{n}_{ij} * TLM_{ij}} + BVA_j} + { $\dot{O}_{i}\dot{O}^{n}$ { QAB^{n}_{ij} * TLM_{ij}} + SVA_j} > 0

$$TQEI_{j}^{+} = \acute{O}_{a}QAEI_{aj}^{+}$$
$$TQEI_{j}^{-} = \acute{O}_{a}QAEI_{aj}^{-}$$

Where:

TQEI_j is **Total Imbalance Short Positions** and is the sum of all $QAEI_{aj}$ where $QAEI_{aj}$ is not greater than zero.

Where the system is short:

$$SBP_j = ISBP_j$$

$$DF_{j} = max\{ MP_{j} - ISSP_{j}, 0 \}$$

Where DF_j is a **Difference Value**, representing the lost revenue per MWh to the System Operator due to Reverse-flow Imbalances.

 $\mathsf{RFIC}_{j} = \{ \acute{O}_{i}\acute{O}^{n} \{ \mathsf{QAB}^{n}_{ij} * \mathsf{TLM}_{ij} \} + \mathsf{SVA}_{j} \} * \mathsf{DF}_{j}$

Where:

RFIC_j is **Reverse-flow Imbalance Cost**, which is the cost to the System Operator of managing Reverse-flow Imbalances.

 $RUOP_{j} = RFIC_{j} / max(TQEI^{+}_{j}, -\{O_{i}O^{n}\{QAB^{n}_{ij} * TLM_{ij}\} + SVA_{j}\}, BRLX\})$

Where:

RUOP_i is Reverse-flow Unit Offset Price

BRLX is a de minimis volume to avoid price distortions and which could be the same as BRL.

Therefore:

$$SSP_{j} = SBP_{j} + RUOP_{j}$$

Where the system is long:

$$SSP_{j} = ISSP_{j}$$

$$DF_{j} = max\{ ISBP_{j} - MP_{j}, 0\}$$

Where DF_j is a **Difference Value**, representing the lost revenue per MWh to the System Operator due to Reverse-flow Imbalances.

Where:

RFIC_j is **Reverse-flow Imbalance Cost**, which is the cost to the System Operator of managing Reverse-flow Imbalances.

$$RUOP_{i} = RFIC_{i} / max(-TQEI_{i}^{-}, {O_{i}O^{n}}{QAO_{i}^{n} * TLM_{i}} + BVA_{i} , BRLX)$$

Where:

RUOP_j is Reverse-flow Unit Offset Price

BRLX is a de minimis volume to avoid price distortions and which could be the same as BRL.

Therefore:

$$SBP_j = SSP_j + RUOP_j$$