October 2001

ASSESSMENT REPORT

MODIFICATION PROPOSAL P27 – Amendment to the Derivation of Imbalance Prices

Prepared by the Pricing Issues Modification Group on behalf of the Balancing and Settlement Code Panel

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b Distribution

Name	Organisation
Pricing Issues Modifications Group	
BSC Panel	

c Intellectual Property Rights and Copyright

II CONTENTS TABLE

1 SUMMARY AND RECOMMENDATIONS

The Summary and Recommendations are provided in attached document P27: 'Amendment to the Derivation of Imbalance Prices.

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

BSC Section F 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).

The Panel may decide to submit a Modification Proposal to an 'Assessment Procedure'[1]. Under this procedure, a Modification Group is tasked with undertaking a detailed assessment of the proposal to evaluate whether it better facilitates achievement of the Applicable BSC Objectives[2]. The group may also develop an alternative proposal if it believes that the alternative would better facilitate achievement of the objectives.

The Modification Group must prepare a report for the Panel, setting out the results of the assessment of the modification proposal and any alternative. The following matter should be included (to the extent applicable to the proposal in question)[3]:

(a) an analysis of and the views and rationale of the Modification Group as to whether (and, if so, to what extent) the Proposed Modification would better facilitate achievement of the Applicable BSC Objective(s);

(b) a description and analysis of any Alternative Modification developed by the Modification Group which, as compared with the Proposed Modification, would better facilitate achievement of the Applicable BSC Objective(s) and the views and rationale of the Group in respect thereof;

(c) an assessment or estimate (as the case may be) of:

  (i) the impact of the Proposed Modification and any Alternative Modification on BSC Systems;

  (ii) any changes and/or developments which would be required to BSC Systems in order to give effect to the Proposed Modification and any Alternative Modification;

  (iii) the total development and capital costs of making the changes and/or delivering the developments referred to in paragraph (ii);

  (iv) the time period required for the design, build and delivery of the changes and/or developments referred to in paragraph (ii);

  (v) the increase or decrease in the payments due under the BSC Agent Contracts in consequence of the Proposed Modification and any Alternative Modification;

  (vi) the additional payments (if different from those referred to in paragraph (v)) due in connection with the operation and maintenance of the changes and/or developments to BSC Systems as a result of the Proposed Modification and any Alternative Modification;

[1] See BSC F2.6
[2] As defined in the Transmission Licence
[3] See BSC F2.6.4 and Annex F-1

(vii) any other costs or liabilities associated with BSC Systems attributable to the Proposed Modification and any Alternative Modification;

(d) an assessment of:

(i) the impact of the Proposed Modification and any Alternative Modification on the Core Industry Documents;

(ii) the changes which would be required to the Core Industry Documents in order to give effect to the Proposed Modification and any Alternative Modification;

(iii) the mechanism and likely timescale for the making of the changes referred to in paragraph (ii);

(iv) the changes and/or developments which would be required to central computer systems and processes used in connection with the operation of arrangements established under the Core Industry Documents;

(v) the mechanism and likely timescale for the making of the changes referred to in paragraph (iv);

(vi) an estimate of the costs associated with making and delivering the changes referred to in paragraphs (ii) and (iv),

together with a summary of representations in relation to such matters;

(e) an assessment of:

(i) the likely increase or decrease in BSC Costs (to the extent not already taken into account in paragraph (c) above) in consequence of the Proposed Modification and any Alternative Modification;

(ii) the changes required to Systems and processes of BSCCo in order to give effect to the Proposed Modification and any Alternative Modification; and

(iii) the BSC Costs which are expected to be attributable to the implementation of the Proposed Modification and any Alternative Modification, to the extent not taken into account under any other provision above;

(f) to the extent such information is available to the Modification Group, an assessment of the impact of the Proposed Modification and any Alternative Modification on Parties in general (or classes of Parties in general) and Party Agents in general, including the changes which are likely to be required to their internal systems and processes and an estimate of the development, capital and operating costs associated with implementing the changes to the Code and to Core Industry Documents;

(g) an assessment of the Proposed Modification and any Alternative Modification in the context of the statutory, regulatory and contractual framework within which the Code sits (taking account of relevant utilities, competition and financial services legislation);

(h) a summary of the representations made by Parties and interested third parties during the consultation undertaken in respect of the Proposed Modification and any Alternative Modification and the views and comments of the Modification Group in respect thereof;

(i) a summary of the analysis and impact assessment prepared by the Transmission Company and the views and comments of the Modification Group in respect thereof;

(j) a summary of the impact assessment prepared by relevant BSC Agents and the views and comments of the Modification Group in respect thereof;

(k) a summary of any impact assessment prepared by Core Industry Document Owners and the views and comments of the Modification Group in respect thereof;

(l) a copy of the terms of reference and any report or analysis of external consultants or advisers engaged in respect thereof;

(m) a list of the key assumptions which the Modification Group has made in formulating its views;

(n) any other matters required by the terms of reference of such Modification Group;

(o) any other matters which the Modification Group consider should properly be brought to the attention of the Panel to assist the Panel in forming a view as to whether the Proposed Modification and any Alternative Modification would better facilitate achievement of the Applicable BSC Objective(s);

(p) subject to paragraph 2.6.8 and 2.6.9 of Section F of the BSC, the proposed text to modify the Code in order to give effect to the Proposed Modification and any Alternative Modification, together with a commentary setting out the nature and effect of such text and of other areas of the Code which would be affected by the changes;

(q) the Modification Group's proposed Implementation Date(s) for implementation (subject to the consent of the Authority) of the Proposed Modification and any Alternative Modification;

(r) an executive summary of the project brief prepared by BSCCo;

(s) a recommendation (where applicable) as to whether, if the Proposed Modification or Alternative Modification is approved, Settlement Runs and Volume Allocation Runs carried out after the Implementation Date of such Approved Modification in respect of Settlement Days prior to that date should be carried out taking account of such Approved Modification or not;

(t) the proposed text (if any) to modify the Memorandum and Articles of Association of BSCCo and/or the BSC Clearer in order to give effect to the Proposed Modification and any Alternative Modification, together with a commentary setting out the nature and effect of such text and of other areas of the Memorandum and Articles of Association and/or the Code which would be affected by the changes; and

(u) a summary of any changes which would be required to Code Subsidiary Documents as a consequence of such Proposed Modification or Alternative Modification.

This Assessment Report therefore addresses all of the above items to the extent relevant to the Modification Proposal in question.

4 MODIFICATION GROUP DETAILS

This Assessment Report has been prepared by the Pricing Issues Modification Group. The membership of the Group is given in Annex 3.

Meetings were held on 27 September 2001 and 5 October 2001 to discuss the effect of the Proposed Modification on the achievement of the Applicable BSC Objectives. In particular, consideration was given to the nature of imbalance prices that might be faced by Trading Parties, and the resulting incentives, were the Proposed Modification to be implemented.

5 DESCRIPTION AND ASSESSMENT AGAINST THE APPLICABLE BSC OBJECTIVES

5.1 The Proposed Modification

The Modification Proposal 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 (SBP) charged on Parties that are short does not reflect the costs imposed, and SBP can be high even though there is a surplus of energy on the System; 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 (SSP) paid to Parties that are long does not reflect the costs imposed, and SSP can be very low, even though the System is short of energy.

The Proposed Modification 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 and forward purchases, in the case that the System is long and the System Operator is generally accepting Bids, or of accepted Bids and forward sales, in the case that the System is short and the System Operator is generally accepting Offers. The Proposed Modification then calculates:

(i) 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 and forward purchases) 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 and forward sales) will be pro-rated on the Account Energy Imbalance volumes of Trading Parties that are long. This pro-rating gives a Reverse Flow Unit Offset Price which, typically, will be deducted from the System Buy Price to give a System Sell Price or, as the case may be, added to the System Sell Price to give the System Buy Price.

5.2 Implementation Options

The Modification Group identified a number of implementation options for investigation, with a view to minimising the impact on Party and BSC Agent systems.

Option 1: Variables relevant to the derivation of the Reverse Flow Unit Offset Price that can be made available close to real-time are calculated and displayed by the BMRA;

Option 2: A modified calculation, requiring only the aggregate System imbalance, and not the imbalance volumes of each individual Party. This enables both SBP and SSP to be displayed on the BMRS (to the extent allowed by other Modifications), although changes the nature of the Reverse Flow Offset Unit Price;

Option 3: Having no requirement to calculate or display additional data on the BMRS.

Impact Assessments were undertaken on all three options.

Options 1 and 3 are variants in the implementation of the Proposed Modification. Option 2 differs from the Proposed Modification sufficiently that it would constitute an Alternative Modification if the Modification Group were to consider that there was any merit in pursuing it. However, the relative merits of the three options were considered (see Section 5.5.3) and **the Modification Group concluded that Option 3 was the preferred option.**

5.3 Proposer's Views

The Proposer believes that the Proposed Modification addresses a problem perceived with energy imbalance prices, namely the System Buy Price paid by Trading Parties that are short can be high even when the System is long overall, and the System Sell Price paid to Trading Parties that are long can be low even when the System is short of energy.

The Proposer argues that the spread that results from the current calculation of System Buy Price and System Sell Price recovers costs from out-of-balance participants which exceed the costs caused by such imbalances. It is further argued that because the spread is not reflective of the costs caused, this is hampering the development of spot markets.

The Proposer believes that the excessive levels of imbalance cashflows that do not reflect the costs of managing imbalances represent an uneconomic and inefficient operation of settlements system and this also hampers the development of competition because the buy-sell spread risk is a significant impediment to smaller players.

5.4 Consultation on Proposal

There were 9 responses received, representing 18 BSC Parties, to a consultation on the Modification Proposal:

- 5 responses representing 7 Parties agreed that there was a problem, although they did not support the proposed solution;
- 1 response, representing 3 Parties, believed that it was inappropriate to suggest further changes to imbalance price calculation until the effect of previous Modifications had been seen;
- 2 responses, representing 4 Parties, disagreed with the Proposal; and
- 1 response, representing 4 Parties (in the addition to the Proposer), supported the Proposal

Responses agreeing that there is a problem to be addressed contended that it is counter-intuitive that System Buy Prices could be high when the System as a whole had surplus energy. There was a view that *both* SBP *and* SSP should rise when the System was short, and that *both* SBP and SSP should drop when the System was long.

However, whilst agreeing that there was a problem to be addressed, some Parties (though not the Transmission Company) were concerned that the Proposed Modification could create greater incentives

for Parties to self-balance after Gate Closure, to the detriment of System Operation. There was some concern, also, that Parties would, much more than now, be trying to second-guess the direction of the overall market imbalance, leading to increased balancing mechanism activity and hence cost. Some responses expressed concern about the robustness of Market Prices.

Responses opposing the Proposed Modification argued that the Proposal would dilute the incentive for Trading Parties to balance by contracting before Gate Closure, and that this would undermine the principles on which the Balancing & Settlement Code trading arrangements are based. Some respondents disagreed that the different allocation of balancing mechanism costs advocated by the proposal would encourage development of spot markets.

5.5 Modification Group Deliberations

The Applicable BSC Objectives, as stated in the Transmission Licence of the Transmission Company, are:

(a) the efficient discharge by the Licensee of the obligations imposed upon it by this licence;

(b) the efficient, economic and co-ordinated operation by the Licensee of the Licensee's Transmission System;

(c) promoting effective competition in the generation and supply of electricity, and (so far as consistent therewith) promoting such competition in the sale and purchase of electricity;

(d) *without prejudice to paragraph 10, promoting efficiency in the implementation and administration of the balancing and settlement arrangements.*

The Modification Group considered the views of the Proposer and the view of respondents to the consultation on the Modification Proposal in the light of these objectives. The Modifications Group did not reach a consensus on whether the Proposed Modification would better meet these objectives. However, the Groups views were as follows.

5.5.1 Market Efficiency

A number of aspects were discussed regarding the ability of the Proposed Modification in better, "*promoting effective competition in the generation and supply of electricity, and (so far as consistent therewith) promoting such competition in the sale and purchase of electricity".*

The Proposer presented an analysis, attached as Annex 8, of the implications of the Proposed Modification, giving examples of the implications of the Proposed Modification on price spreads in different circumstances.

5.5.1.1 Imbalance Price Spreads

According to whether the market, i.e. the aggregate of all Trading Parties[4] Account Energy Imbalance Volumes, is long or short, either the SSP or SBP, respectively, will be calculated in the same manner as

[4] Note that it is appropriate to *exclude* the Account Energy Imbalance Volume of the Transmission Company in assessing whether the market is long. To demonstrate this, consider a hypothetical case in which the Transmission Company (but not other Parties) had perfect foresight, and was able to balance the System entirely by forward contracting instead of accepting Offers and Bids. In the case, the aggregate of *all* Account Energy Imbalance Volumes would be zero, whereas the aggregate of all Account Energy Imbalance Volumes *excluding* the Transmission Company would be the same as the aggregate of *all* Account Energy Imbalance Volumes had the Transmission Company not contracted forward and had accepted Offers and Bids only. Thus, unless the Transmission Company's Account Energy Imbalance Volumes are excluded, the measure of whether the market is long or short will vary according to whether balancing actions are taken in the forward market or balancing mechanism.

now. The 'other' price, i.e. respectively either SBP or the SSP, will be equal to the 'main' price modified by the Reverse Flow Unit Offset Price (RUOP). Consequently the Group agreed that the effect of the Proposed Modification consequently would be to reduce the spread between SBP and SSP.

The Proposer argued that the Proposed Modification would thus make it easier for Trading Parties to contract to match their physical exposures, whether by writing financial derivative contracts[5] or by notifying physical contracts. The Modification Group agreed, and noted that this greater ability to contract could increase the efficiency of the market. The Proposer also argued that this improvement would be particularly important for smaller players who currently have a disproportionate problem – at least in the absence of fully-developed consolidation services - in managing imbalance risk. To the extent that there are economies of scale, it thus also creates a barrier to entry by increasing the costs until a new entrant achieves that economy of scale.

5.5.1.2 Incentive to Balance

The Group recognised that presently the trading arrangements, and the resulting prices, give an incentive for the market to "go long". Due to the uncertainty of physical demand, and the greater consequences of being exposed to System Buy Price compared with System Sell Price, Suppliers will tend to buy greater contract volumes than their unbiased expectation of their demand. Generators will be willing to sell these greater volumes of contracts, but will intend - making physical notifications accordingly - to generate these greater volumes so as not to go short. Thus, the System Operator typically has to accept Bids in order to balance the System.

A view was that the Proposed Modification would reduce the incentive to go long, because the consequences of being short (and thus exposed to SBP) in a long market would be less severe. Whether a Party was to be exposed to SSP or SBP would now be dependent on whether the market overall were long or short, and hence the best strategy would be to avoid imbalance in either direction. The counter-view was that, to the extent that SBP and SSP can be forecast now, the incentive would be to estimate the probabilities that the market would be either long or short. Trading Parties would then compare the expected price to the price in forward markets. Simple arbitrage would then dictate that Trading Parties would go as long as possible or as short as possible, until the arbitrage opportunity had been closed. Elimination of the bias of the market to go long, the Group believed would result in more efficient prices.

5.5.1.3 Linkage between markets

The arbitrage effect described in the previous section would increase the demand or supply of contracts in the short-term forward markets until the market price was equal to the expectation of SBP and SSP. The Group noted that this would create more 'linkage' between the forward markets and imbalance prices, which may increase market efficiency. Annex 8 provides examples.

5.5.2 Effect on System Operation

The Group agreed, by the reasoning given in Section 5.5.1.2, that the Proposed Modification would reduce the incentives on Trading Parties to self-balance their own portfolio, but that it would increase the incentive to self-balance against the whole market. Accordingly, the Modification Group agreed that the Proposed Modification could impair "*the efficient, economic and co-ordinated operation … of the … Transmission System".* However, the Modification Group was unable to reach a consensus on whether this effect would be material, and sufficient to outweigh any market efficiency benefit.

[5] E.g. contracts for differences.

The Transmission Company response (Annex 5) stated that a possible result of this modification could be to reduce the incentive on Trading Parties to contract, which could increase the number of balancing actions, potentially impairing the "*the efficient, economic and co-ordinated operation … of the … Transmission System"*. However, the Modifications Group, again, was unable reach a consensus on whether this effect would be material.

5.5.3 Timing of Imbalance Price Publication

The Group identified that the Proposal has an effect on the timing with which imbalance prices can be determined and published. As originally envisaged, imbalance prices should be available on the Balancing Mechanism Reporting System within 15 minutes of the end of the Settlement Period, although certain modifications, such as P18A, "Removing the Effect of System Balancing Actions", compromise the ability to do this, particularly using the interim implementation from 25 September 2001. Although the Reverse Flow Imbalance Cost, can be determined shortly after the Settlement Period, provided that Balancing Services Adjustment Data (BSAD) and Market Price is available, the Reverse-Flow Unit Offset Price cannot be determined finally until all of the imbalances on all of the Trading Parties' accounts has been established.

The Transmission Company has confirmed that it is working towards providing BSAD data half-hourly at Gate Closure by 1 April 2002[6]. The availability of Market Price data in real-time would depend on what source or sources of data were designated for the purposes of establishing the Market Price. However, it is understood that it is possible for exchanges to provide a reference price in timescales comparable to Gate Closure.

However:

(i) it was noted that the Initial System Sell Price and the Initial System Buy Price would continue to be available in the same timescales as now. In addition, whether the market was long or short could also be known in real-time, and hence whether the two imbalance prices were close to Initial System Sell Price or Initial System Buy Price could also be determined.

(ii) it was argued that uncertainty for Trading Parties over the Reverse Flow Unit Offset Price would be no greater than the uncertainty associated with the Residual Cashflow Reallocation Cashflow. A counter-argument was that this argument was dependent on the relative sizes of Reverse Flow Imbalance Cost and Total System Residual Cashflow and the corresponding bases over which the costs were spread, i.e. the total volume of Accepted Offers and Bids, or the total Credited Energy Volumes[7].

Given that the exact Reverse Flow Unit Offset Price could not be known in the timescales required for display on the BMRA, and, if the uncertainty associated with it were indeed small, then the option of *not* calculating and displaying data on the BMRA, i.e. Option 3, would appear to be feasible.

5.5.4 Price Volatility

A further observation is that the Proposal may increase the volatility of imbalance prices. Though the spread between System Buy Price and System Sell Price is likely to be reduced by the Proposal, whether the two imbalance prices are close to the existing System Buy Price or to the existing System Sell Price will depend, from Settlement Period to Settlement Period, on the whether the System is

[6] Ref. Table 4, NGC Procurement Guidelines, V1.1, 21 September 2001.
[7] To be precise, Credited Energy Volumes summed over all BM Units in delivering Trading Units minus Credited Energy Volumes summed over all BM Units in off-taking Trading Units.

deemed to have been long or short. Thus the volatility of System Buy Price and System Sell Price would each increase.

However, it was noted that a Trading Party seeking to maintain a balancing position was already subject to such volatility. This was not so much as a result of volatility in the individual prices, but as a result of uncertainty over *which* price the Trading Party would be exposed to.

5.5.5 Other Modifications Affecting Imbalance Pricing

Views differed, however, as to whether the effect of other Modifications or Proposed Modifications would affect the arguments in favour or against P27. Whilst the principles regarding unreasonable recovery of costs, and that lower spreads would improve 'hedgeability', some felt that the implementation of other Modifications would reduce the effects to a *de minimis* level.

Similarly, on the subject of timing, one view was that it would be prudent to wait until the effect of other pricing Modifications, e.g. P18A, had been seen, which might reduce the materiality of the Proposed Modification. Set against this was the view that any delay in the implementation of the Proposed Modification might affect detrimentally a number of Trading Parties not just for the coming Winter, but for Winter 2002/3 too.

5.6 Further Issues

Further issues that the BSC Panel required to be addressed by the Modification Group were:

- the adequacy of publicly traded markets in providing a Market Price;
- 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;
- an analysis against the two different types of imbalance (notified action and spill);
- possible interactions with other proposed Modifications, particularly against P12: Reduction of Gate Closure to 1 Hour;
- the effect of the proposal on the incentive to participants to balance;

Addressing these in turn:

5.6.1 Adequacy of publicly traded markets:

A feature of the Proposed Modification is it's reliance on a "Market Price", being an index derived from publicly-traded forwards markets. A potential concern is thus that there are no indices available that are sufficiently representative of the prices at which forwards markets trades are taking place.

However, a precedent has been set as to the principle of using such indices. The Scottish Wholesale Price (SWP) is a price that is used in the regulation of the trading arrangements in Scotland. Prior to trading under the Balancing & Settlement Code, SWP was based on the England & Wales Pool Purchase Price (PPP). With the abolition of PPP, SWP is now based on a combination of a number of indices from price reporting services - Argus, Heren, Platts and Spectron – and the UKPX power exchange.

No formal impact assessment was done on the cost of obtaining a data feed from any particular source, as the designation of the source of Market Data is something that the Panel would determine from time to time, and no binding commitment would apply to any cost information obtained from a potential

source. However, both UKPX and APX have indicated that data could be made available, in real-time, if required, at minimal cost. Exchanges already make such data available to various information providers such as Reuters, Bloombergs, etc.

The Modification Group agreed that there was merit in adopting the same designation for Market Price for this Proposed Modification as Proposed Modification P26, "Market-Driven Trading Neutrality Band".

Proposed Modification P25 also proposes the use of such a price.

5.6.2 Effect of arbitrage-accepted and constraint-related balancing mechanism actions

The Proposed Modification does not include the removal of constraint-related or arbitrage-tagged Offers and Bids for the calculation of the Reverse Flow Imbalance Cost. Consequently:

(i) when the System is long, constraint-related Offers, which were excluded from the calculation of SBP, would increase Reverse Flow Imbalance Cost (by increasing the volume to which the Difference Value[8] were applied) and would increase the new SBP; and

(ii) when the System is short, constraint-related Bids, which were excluded from the calculation of SSP, would increase Reverse Flow Imbalance Cost and would decrease the new SSP.

Thus, the spread in imbalance prices is increased, relative to the spread that would result if these Accepted Offers and Bids were excluded. Similarly the inclusion of Arbitrage-accepted Offers and Bids would increase the volume to which the Difference Values were applied and hence would further increase the spread in imbalance prices.

5.6.3 Effects on Offer and Bid Prices

To the extent that Trading Parties may make a choice between taking imbalance price and submitting Offers and Bids which might subsequently be accepted, then a change in the derivation of imbalance prices could have an effect on the Offer and Bid Prices that Trading Parties are prepared to submit.

In particular, when the System is short, the effect of the Proposed Modification is to produce a higher System Sell Price. With the prospect of higher System Sell Prices being paid to Trading Parties for energy spilled on to the System, Trading Parties might be inclined to increase Offer Prices for energy provided to the System as balancing mechanism actions. This would increase System Buy Price, which could further increase SSP.

Similarly, when the System is long, the effect of the Proposed Modification is to produce a lower System Buy Price. With the prospect of lower System Buy Prices being paid by Trading Parties for energy taken from the System as 'top-up', Trading Parties might be inclined to reduce Bid Prices for energy taken from the System as balancing mechanism actions. This would decrease System Sell Price, which could further decrease SBP.

5.6.4 Analysis against the two different types of imbalance (notified action and spill)

The difference between balancing mechanism actions and spill is addressed above in Section 5.6.3.

There would be no difference in treatment between energy off-taken or delivered as imbalance, i.e. not under bilateral contract, and notified by FPN, and imbalances not notified by FPN.

[8] The Difference Value being, when the System is long, the present Market Price less the current System Sell Price.

5.6.5 Interactions with other proposed Modifications

Other Proposed Modifications have been submitted, and some approved, which affect the spread in imbalance prices. These will have a consequential effect on the magnitude of Difference Values - generally to reduce it – but will not affect the methodology of this Proposed Modification.

The extent to which a recommendation to accept or reject the Proposed Modification is affected by other Modifications is discussed in Section 5.5.5.

A further Modification Proposal, P12, proposes a reduction of Gate Closure to one hour. This would make the provision of BSAD and Market Price data close to the end of the Settlement Period a more onerous task, but would otherwise not affect the methodology.

5.6.6 Effect of the proposal on the incentive to participants to balance

See Section 5.5.1.2.

5.6.7 Cost-benefit analysis

No formal analysis of the benefits was undertaken by the Group, although it was considered that, if it were decided that the Proposed Modification better meets the Applicable BSC Objectives, the benefits would be likely to considerably outweigh the development and implementation costs.

6 IMPACT ON BSC AND BSCCO DOCUMENTATION

6.1 BSC

No legal drafting has been done during the Assessment Report, as the Modification Group felt that the definition of the Proposed Modification provided by the Proposer was sufficiently detailed to allow for an effective assessment.

Sections B, C, E, T, V and X of the BSC would require amendment, with the most substantive changes occurring in Section T. Drafting of legal text could undertaken, if appropriate, during the Report Phase.

6.2 Code Subsidiary Documents

A new BSC Procedure might be required for the designation of Market Price. The requirement would be identified during the drafting of legal text.

6.3 BSCCo Memorandum and Articles of Association

No impact on the ELEXON's Memorandum and Articles of Association was identified.

7 IMPACT ON BSC SYSTEMS

Full text of the Impact Assessments by Logica, in its role as the various BSC Agents, is contained in Annex 4.

Development and implementation costs have been estimated (see Section 7) at £430,991 for Option 1 and Option 2, and at £336,317 for Option 3. Corresponding operation and maintenance costs are estimated to be £6,465 per month (£77,580 per annum) and £5,044 per month (£60,528 per annum).

Accordingly the Group considers that Option 3 is the preferred implementation option, with the additional information that could be displayed on the BMRA being of marginal benefit.

8 IMPACT ON CORE INDUSTRY DOCUMENTS AND SUPPORTING ARRANGEMENTS

There have been no responses by Core Industry Document owners to indicate that there is an impact on the Core Industry Documents or supporting arrangements.

9 IMPACT ON THE TRANSMISSION COMPANY

Annex 5 contains the impact assessment undertaken by the National Grid Company (NGC).

NGC has expressed concerns regarding the effect on imbalance prices, particularly in the light of other Modifications and Proposed Modifications affecting imbalance prices also. NGC has also questioned whether the incentive on Trading Parties to contract could be undermined if the SBP were to be lower than the Market Price, or SSP higher than the Market Price in a significant number of Settlement Periods.

10 IMPACT ON ELEXON

Minimal effort (approximately 8 man-days) is required by ELEXON Design Authority to review and update maintained documents.

Assisting the Panel in the designation of Market Price data and the management of the Central Services Provider in the implementation of a new source of Market Price data would require some additional effort.

11 IMPACT ON PARTIES AND PARTY AGENTS

The full text of the Impact Assessments is given in Annex 7, but is summarised in the table below. Support for the Proposed Modification is, as with the initial consultation on the Modification Proposal, in the minority.

Party / Party Agent	Agree?	Notification Req'd	Cost
Bridge of Cally Energy Investments	-	No impact	-
IMServ	-	No impact	-
Siemens Metering Services	✔	No impact	-
GPU Power	-	-	-
London Electricity	✔	3 months	£10k
SEEBoard	✘	50 days	-
Barking Power	✘	6 months	-
Npower	✘	12 months	-
Economy Power	✘	-	-
Scottish and Sourthen	✔	6 months	-
Vattenfall	✔	10 days	-
Yorkshire Electricity	✘	-	"Major impact"
British Energy	✘	2 months	
TXU Europe	✘	-	£150k

Impacts range from 10 days to 12 months in terms of notification required, all of which are within the likely timescales for implementation by the BSC Agents. Little cost information was forthcoming by BSC Parties or Party Agents.

ANNEX 1 – PROPOSED CHANGES TO BSC[9]

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 $\{\Sigma_i\Sigma^n\{QAO^n_{ij} * TLM_{ij}\} + BVA_j\} > 0$ then:

$$ISBP_j = \{\Sigma_i\Sigma^n\{QAO^n_{ij} * PO^n_{ij} * TLM_{ij}\} + BCA_j\} / \{\Sigma_i\Sigma^n\{QAO^n_{ij} * TLM_{ij}\} + BVA_j\}$$

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

If $\{\Sigma_i\Sigma^n\{QAB^n_{ij} * TLM_{ij}\} + SVA_j\} < 0$ then:

$$ISSP_j = \{\Sigma_i\Sigma^n\{QAB^n_{ij} * PB^n_{ij} * TLM_{ij}\} + SCA_j\} / \{\Sigma_i\Sigma^n\{QAB^n_{ij} * TLM_{ij}\} + SVA_j\}$$

Else $ISSP_j$ is a default [calculated in the same way as for default SSP_j 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:

$$\{\Sigma_i\Sigma^n\{QAO^n_{ij} * TLM_{ij}\} + BVA_j\} + \{\Sigma_i\Sigma^n\{QAB^n_{ij} * TLM_{ij}\} + SVA_j\} > 0$$

otherwise system is long. [Need default rules where system is exactly balanced].

$$TQEI^+_j = \Sigma_a QAEI^+_{aj}$$

$$TQEI^-_j = \Sigma_a QAEI^-_{aj}$$

where:

$TQEI^+_j$ is **Total Imbalance Long Positions** and is the sum of all $QAEI_{aj}$ where $QAEI_{aj}$ is greater than zero; and

$TQEI^-_j$ 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.

$$RFIC_j = \{\Sigma_i\Sigma^n\{QAB^n_{ij} * TLM_{ij}\} + SVA_j\} * DF_j$$

[9] Legal drafting has not been prepared for the Assessment Report, as Modification Group considered the following description to be sufficiently precise to permit an effective assessment.

Where:

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

$$RUOP_j = RFIC_j / \max(TQEI^{+}_j , -\{\Sigma_i\Sigma^n\{QAB^n_{ij} * TLM_{ij}\} + SVA_j\} , BRLX\})$$

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:

$$SSP_j = SBP_j + RUOP_j$$

***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.

$$RFIC_j = \{\Sigma_i\Sigma^n\{QAO^n_{ij} * TLM_{ij}\} + BVA_j\} * DF_j$$

Where:

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

$$RUOP_j = RFIC_j / \max(-TQEI^{-}_j , \{\Sigma_i\Sigma^n\{QAO^n_{ij} * TLM_{ij}\} + BVA_j\} , BRLX\})$$

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:

$$SBP_j = SSP_j + RUOP_j$$

ANNEX 2 – MODIFICATION GROUP TERMS OF REFERENCE

Additional terms of reference for the Modification Group were provided by the Panel that required that the following issues should be addressed:

- Clarification on how the proposal further meets 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;
- an analysis against the two different types of imbalance (notified action and spill);
- possible interactions with other proposed Modifications, particularly against P12: Reduction of Gate Closure to 1 Hour;
- the effect of the proposal on the incentive to participants to balance;
- a costs and benefits analysis.

ANNEX 3 – MODIFICATION GROUP MEMBERSHIP

The Modification Group membership was as follows:

Member	**Organisation**
Justin Andrews	ELEXON (Chair)
Maurice Smith	Campbell Carr (representing the Proposer)
Richard Lavender	NGC
Duncan Jack	St. Clements Services
Damian Johnson	Amerada Hess
Afroze Miah	PowerGen
Danielle Lane	British Gas Trading
Simon Hadlington	British Gas Trading
Adam Higginson	Ofgem
Nick Elms	Enron
Ben Willis	Innogy Yorkshire
Paul Mott	London Electricity
Peter Wibberley	ELEXON (Analyst)

ANNEX 4 – BSC AGENT IMPACT ASSESSMENTS

A4.1 Implementation of P27 separately from P26

To be completed by the Originator						
Change Request ID (to be provided by the Customer) P27 Logica reference:			Service affected SAA / BMRA			
Change Request Name: ICR146			Amendment to the Derivation of Imbalance Prices			
Agreement by the customer to proceed to the next stage						
	High Level Assessment	Detailed Level Assessment	Change Quotation	Implement Change	Emergency Fix Report	Change Request under Clause 14.2 (delay)
Tick which stage is being requested		✔				
Signed by Customer Baseline Manager						
Signed by Customer Contract Manager						
Date of agreement to proceed to next stage					n/a	n/a
Date this stage to be completed by		28/09/01				
Configuration of Service(s) (baseline affected)						
Assumed Changes (over baseline)	.					
Priority	High/Medium/Low					
Identified by : Sandy Blows			Date Submitted: 07/09/01			
Description of Change See attached original P27 .						
Reason for Change (benefits) See attached original P27						
Implications of not making the change See attached original P27						
Attachments/references	P27					
Competition Item Yes/No/n/a	Reasons for Competition					
If Change Request made under Clause 14.2 (delay)	Required supporting information attached					

To be completed by the Service Provider			
	High Level Assessment	Detailed Level Assessment	Change Quotation
Tick which stage is being completed		✔	
Signed by Service Provider Contract Manager			
Date		28/09/01	

Validity period of costs/prices	Change Quotation	
	Change	30 days

Does the change involve any changes to the System or Services	Yes
Would the undertaking of a Detailed Level Assessment or Change Quotation delay the Trigger Milestone or the Planned Go-Live Date before Go Live or any Release Date after Go Live	N/a
If Yes – specify which Milestones/Release Dates would be affected	N/a
Impact on any Milestones of incorporation of change	N/a

Indicative impact on resources for change incorporation	Phase of the work			
	Design	Build	Test & Trial	Operate
Labour				
Materials/3rd Party				

Impact on Service Levels	None
Impact on IDD	Yes

Price for Detailed Level Assessment		Indicative/firm
Price for Change Quotation		Indicative/firm
Price for Change		
Option 1	£430,991 (ex VAT) to develop and implement this change £6,465 (ex VAT) per month to operate and maintain	Firm Firm
Option 2	£430,991 (ex VAT) to develop and implement this change £6,465 (ex VAT) per month to operate and maintain	Firm Firm
Option 3	£336,317 (ex VAT) to develop and implement this change £5,044 (ex VAT) per month to operate and maintain	Firm Firm

Assumptions for the above Price:

- The price quoted for this change is based on the assumption that it is not developed in parallel with Release 2
- The pricing does not include any additional reporting requirements other than those explicitly detailed in the P27 change details.
- This change will be implemented as a patch with localised integration testing.
- Depending on which options are selected, deployment will require a planned outage.
- Interface testing for new data sources is excluded from the prices for the P27options.
- Participant testing is excluded from the price and any required is expected to be charge T&M.
- Logica will invoice 30% on receipt of CN or authorised start of work, 50% on completion of acceptance tests, 20% on deployment or one month after completion of acceptance tests, whichever is sooner.
- The Service Description will have been updated by ELEXON and agreed with Logica prior to commencement of work.
- For all formal documentation which is subject to review, Logica shall provide one draft issue to the Client. The Client shall review and provide written comments on, or its acceptance of, such documentation within 5 working days of such delivery.
- Within reasonable levels, ELEXON will make available appropriate staff to assist Logica during the development of this change
- There will be no new Service Levels.
- The O+M charge has been estimated as a proportion of the price.

If the change is to be incorporated after Go Live, is this change proposed to be a patch or release		
If patch, expected time of incorporation		
If release - what release number	Release number	
Date	Release Date	
For High Level Assessment only – is it a Detailed Level AssessmentYes/No	If No, estimate of time and resources required to complete	

Resources Required to undertake	Detailed Level Assessment	Change Quotation
Labour		
Materials		

Consequential amendments to base line:	
Proposed method of Change/ Work statement	Option 1 involves calculating and displaying data which can be calculated in near real time and accept the risk on the subsequent real SBP and SSP. Option 2 involves performing a different calculation so that the SBP and SSP can be derived promptly and displayed. Option 3 involves having no new data calculated or displayed by BMRA.

Has the customer has indicated this is a competitive change			No
	Service Provider Plan for competition		
	Risks/Constraints of competition		
	Service Provider plan for incorporation of change including testing		
	Documentation to be produced by Service Provider to enable competition according to plan above		
	Indicative costs of Service Provider role in competition		
For Change Notice only – to be completed by the Customer			
Basis for payment			
Agreed Customer Caused Delay: Yes/No **If Yes, amount of delay**			
Date Change to become effective.		**Is this to be a Release Date? Yes/No**	
Other items as required under the Change Management Procedures			

A4.2 Implementation of P27 in combination with P26

To be completed by the Originator						
Change Request ID (to be provided by the Customer) P26 (Option 1) and P27 (Option 3) Logica reference:			Service affected SAA/BMRA			
Change Request Name: ICR145 and ICR146			Combined P26 and P27			
Agreement by the customer to proceed to the next stage						
	High Level Assessment	Detailed Level Assessment	Change Quotation	Implement Change	Emergency Fix Report	Change Request under Clause 14.2 (delay)
Tick which stage is being requested		✔				
Signed by Customer Baseline Manager						
Signed by Customer Contract Manager						
Date of agreement to proceed to next stage					n/a	n/a
Date this stage to be completed by		28/09/01				
Configuration of Service(s) (baseline affected)						
Assumed Changes (over baseline)	.					
Priority	High/Medium/Low					
Identified by : Sandy Blows			Date Submitted: 07/09/01			
Description of Change See attached original P26 (O1) & P27 (O3) .						
Reason for Change (benefits) See attached original P26 (O1) & P27 (O3)						
Implications of not making the change See attached original P26 (O1) & P27 (O3)						
Attachments/references	P26 (O1) & P27 (O3)					
Competition Item Yes/No/n/a	Reasons for Competition					
If Change Request made under Clause 14.2 (delay)	Required supporting information attached					

To be completed by the Service Provider			
	High Level Assessment	Detailed Level Assessment	Change Quotation
Tick which stage is being completed		✔	
Signed by Service Provider Contract Manager			
Date		28/09/01	

Validity period of costs/prices	Change Quotation	
	Change	30 days

Does the change involve any changes to the System or Services	Yes
Would the undertaking of a Detailed Level Assessment or Change Quotation delay the Trigger Milestone or the Planned Go-Live Date before Go Live or any Release Date after Go Live	N/a
If Yes – specify which Milestones/Release Dates would be affected	N/a
Impact on any Milestones of incorporation of change	N/a

Indicative impact on resources for change incorporation	Phase of the work			
	Design	Build	Test & Trial	Operate
Labour				
Materials/3rd Party				

Impact on Service Levels	None
Impact on IDD	Yes

Price for Detailed Level Assessment		Indicative/firm
Price for Change Quotation		Indicative/firm
Price for Change		
P26 (Option 1) and P27 (Option 3)	£508,871 (ex VAT) to develop and implement this change £7,633 (ex VAT) per month to operate and maintain	Firm Firm

Assumptions for the above Price:

- The price quoted for this change is based on the assumption that it is not developed in parallel with Release 2
- The pricing does not include any additional reporting requirements other than those explicitly detailed in the P26 and P27 change details.
- This change will be implemented as a patch with localised integration testing.
- Depending on which options are selected, deployment will require a planned outage.
- Interface testing for new data sources is excluded from the prices for the P27options.
- Participant testing is excluded from the price and any required is expected to be charge T&M.
- The functionality for the P26 and P27 option is still separate, but the development will be done at the same time.
- Logica will invoice 30% on receipt of CN or authorised start of work, 50% on completion of acceptance tests, 20% on deployment or one month after completion of acceptance tests, whichever is sooner.
- The Service Description will have been updated by ELEXON and agreed with Logica prior to commencement of work.
- For all formal documentation which is subject to review, Logica shall provide one draft issue to the Client. The Client shall review and provide written comments on, or its acceptance of, such documentation within 5 working days of such delivery.
- Within reasonable levels, ELEXON will make available appropriate staff to assist Logica during the development of this change
- There will be no new Service Levels.
- The O+M charge has been estimated as a proportion of the price.

If the change is to be incorporated after Go Live, is this change proposed to be a patch or release		
If patch, expected time of incorporation		
If release - what release number	Release number	
Date	Release Date	
For High Level Assessment only – is it a Detailed Level AssessmentYes/No	If No, estimate of time and resources required to complete	

Resources Required to undertake	Detailed Level Assessment	Change Quotation
Labour		
Materials		

Consequential amendments to base line:	
Proposed method of Change/ Work statement	P26 Option 1 uses a fixed MWh Trading Neutrality Band. and P27 Option 3 involves having no new data calculated or displayed by BMRA.

Has the customer has indicated this is a competitive change			No
	Service Provider Plan for competition		
	Risks/Constraints of competition		
	Service Provider plan for incorporation of change including testing		
	Documentation to be produced by Service Provider to enable competition according to plan above		
	Indicative costs of Service Provider role in competition		
For Change Notice only – to be completed by the Customer			
Basis for payment			
Agreed Customer Caused Delay: Yes/No **If Yes, amount of delay**			
Date Change to become effective.		**Is this to be a Release Date? Yes/No**	
Other items as required under the Change Management Procedures			

ANNEX 5 – TRANSMISSION COMPANY IMPACT ASSESSMENT

Carried out by	Approve /Reject	Comments
Phil Lawton, National Grid		Notification required – None (provided BSAD change is made). Impact – YES Comments - Since our initial comments on P27, P18A has been implemented by Ofgem and the Panel has approved BRL = 5MWh (but still awaiting final Ofgem approval). The contribution of the above two changes will have a very significant impact on the spread of SBP and SSP. We believe it would be sensible to see the results of these changes before trying to assess the merits of another pricing modification. Therefore we cannot support this modification at this time. Accordingly, until the above changes have settled into the 'pricing system', we cannot make a judgement on which BSC/Transmission Licence objectives (if any) the highly complex proposal better achieves. The Applicable BSC Objectives (as defined in the Transmission Licence) are: i. the efficient discharge by the Licensee of the obligations imposed upon it by the licence; ii. the efficient, economic and co-ordinated operation by the Licensee of the Licensee's Transmission System; iii. promoting effective competition in the generation and supply of electricity, and (so far as consistent therewith) promoting such competition in the sale and purchase of electricity; and iv. promoting efficiency in the implementation and administration of the balancing and settlement arrangements. We note that the Proposer has stated that P27 will better "facilitate competition in generation and supply" - objective (iii). However, if the formulation of imbalance prices gives rise to a significant number of periods when SBP is below the 'market price' or SSP is above the 'market price' this is likely to counter objective (ii) by undermining the present incentive to contract. It should also be noted that the proposal recommends replacing the existing pricing mechanism with a more costly data sources and complex algorithms, which may be viewed as counter to objective (iv). We are aware that the requirement specification refers to the proposed modification to the availability of the Balancing Services Adjustment Data (BSAD). This proposal was specified by National Grid in our Procurement Guidelines (Ref: Table 4) and I would like to re-iterate that we still intend to provide BSAD data "half-hourly at Gate Closure for settlement 3.5 hours ahead". We can confirm that we are currently looking at the feasibility and analysis stage and see no reason why we cannot deliver by 1 April 2002. However, I would also like to point out a potential interaction with P12, where the practicality of providing the BSAD will have to be reviewed if gate closure were reduced to 1 hour.

ANNEX 6 – BSCCO IMPACT ASSESSMENT

Carried out by	Approve	Reject	Comments
Clive Cushen, ELEXON			*Impacts on DA maintained products:* **P26:** **Neta Data File Catalogue:** est. 2 md inc. reviews **Reporting Catalogue:** est. 1 md inc. reviews **SVA Catalogue:** no impact **Business Process Model**: est. 2 md inc. reviews **Website Market Data URS:** est. 1 md inc. reviews **P27:** **Neta Data File Catalogue:** Est. 3 md inc. reviews **Reporting Catalogue:** Est. 1 mdinc. reviews **SVA Catalogue:** No impact **Business Process Model:** Est. 3 md inc. reviews **Website Market Data URS:** Est. 1 md inc. reviews

ANNEX 7 – BSC PARTY AND PARTY AGENT IMPACT ASSESSMENT

Carried out by	Approve	Reject	Comments
Stephen Mooney, Bridge of Cally Energy Investments Ltd.			No Impact. No notification required.
Corrina Harvey, Imserv Europe			No Impact.
Lina Shah, Siemens Metering Services	✓		I agree with the proposed changes. No notification required. No Impact.
Clive Cushen, ELEXON			*Impacts on DA maintained products:* **P26:** **Neta Data File Catalogue:** est. 2 md inc. reviews **Reporting Catalogue:** est. 1 md inc. reviews **SVA Catalogue:** no impact **Business Process Model**: est. 2 md inc. reviews **Website Market Data URS:** est. 1 md inc. reviews **P27:** **Neta Data File Catalogue:** Est. 3 md inc. reviews **Reporting Catalogue:** Est. 1 mdinc. reviews **SVA Catalogue:** No impact **Business Process Model:** Est. 3 md inc. reviews **Website Market Data URS:** Est. 1 md inc. reviews
Rachael Gardiner, GPU Power			No Comment
Drew Richard/Ian Dunn, London Electricity	✓	✓	I agree with the proposed changes. Impact: YES Notification required: 3 Months Comments: From an I.T. point of view both Modifications will effect our Settlements systems. A high-level impact assessment

Carried out by	Approve	Reject	Comments
			was that MP26 would cost approx. £16,000, and MP27 would cost approx. £10,000.
Dave Morton, SEEBOARD		✓	I disagree with the proposed changes. Notification required: 50 days (subject to other high priority work on impacted systems). Impact – YES Comments: Despite the detailed formulae and the alternative requirements our position on P27 remains the same. We believe that the principle of this proposal is at odds with the efficient operation of the transmission system. Seeboard does not support P27 in any of the suggested forms.
Janice Tanner, Barking Power Ltd		✓	I disagree with the proposed changes. Notification required: 6 months Impact – YES Comments: Albeit if Barking Power are obliged to make these changes, the 6 months notice period would be effective from the issue of the IDD.
Helen Lees, Npower Ltd		✓	I disagree with the proposed changes. Notification required: Minimum of 12 months. Impact – YES Comment - A significant number of systems and processes would need amending in order to introduce these changes.
Leyton Jones, Economy Power		✓	Disagree with proposed changes
Sue Macklin, Scottish and Southern Energy plc, Southern Electric	✓		I agree with the proposed changes. Notification required: 6 months Impact - YES

Carried out by	Approve	Reject	Comments
Bo Wahrgren, Vattenfall AB	✓		We agree to the proposed changes. Notification required: 10 days. Impact - YES. Comments: A number of Mod Proposals have been dealing with the System Prices. We are in principle very much in favour of finding ways to improve the way these prices are calculated and applied. However we believe that it might be necessary to take a broader view on the issue, otherwise there is a risk of creating a piece of patchwork with all the different Mod Proposals implemented, that might not be efficient and manageable.
Emma Coates, Yorkshire Electricity		✓	We disagree to the above change proposal on the basis of the amount of changes required to systems & processes. This will have major impact on us.

ANNEX 8 – PROPOSER'S ANALYSIS OF POTENTIAL EFFECT ON IMBALANCE PRICES

Introduction

This paper is written in support of Proposal P27. It addresses the specific aspect of participant reaction to expected BM prices under a P27 regime relative to the current regime. Success is measured by the extent to which participants cease to adjust their contract position to expected metered output.

The paper is in two parts: first order results and second order implications.

First order results

Tables 2 and 3 model results from different scenarios. In essence, different price outcomes are taken as givens and their implications are assessed. Underlying the tables are different volumes going through the balancing mechanism and through the market. These scenarios are given in Table 1.

Table 1: Volume parameters

	Scenario 1		Scenario 2		Scenario 3	
	System Long	System short	System Long	System short	System Long	System short
	MWh					
Participant positions						
Participants who are short						
Short parties' metered positions	15,000	15,000	15,000	15,000	15,000	15,000
Short parties' contracted position	15,500	16,000	15,100	15,100	15,100	15,100
Gross shortfall	- 500	- 1,000	- 100	- 100	- 100	- 100
Participants who are long						
Long parties' metered position	15,000	15,000	15,000	15,000	15,000	15,000
Long parties' contracted position	14,000	14,500	14,800	14,950	14,850	14,950
Gross spill	1,000	500	200	50	150	50
NGC Position						
System buys	100	600	600	600	100	100
System sells	- 600	- 100	- 700	- 550	- 150	- 50
System Net Buy/(sell = negative)	- 500	500	- 100	50	- 50	50

The volume parameters are for an example half-hour. The differences between the scenarios are as follows:

Scenario 1: Participant gross imbalances are bigger than system imbalances. This means that offset imbalance costs are smeared across a large volume of participant imbalances.

Scenario 2: Participant gross imbalances are less than system imbalances. This happens where NGC does significant matched buys and sells in a market where participants have succeeded in balancing more tightly.

Scenario 3: Both NGC buys and sells and participant gross imbalances fall below a preset minimum. In this analysis, that minimum is set at 180 MWh for no good reason other than that was where BRL was set. This is 0.6% of market throughput in this example. The purpose of a de minimis level is to avoid bizarre prices being set in a very thin market – its precise level can be the subject of debate.

Tables 2 and 3 require some explanation. The essential difference between the tables is that in Table 3, the value of SSP is negative. This is done to test potential distortions. It should not be a frequent occurrence in a liquidly competitive mechanism.

The following explanations apply to the tables:

SBP/SSP original	As calculated at present.
Shortfall price	A P27 proposed outcome, which is the price paid by all parties who are short at settlement.
Market price	As prescribed by the Panel.
Spill price	A P27 proposed outcome, which is the price paid to all parties who are long at settlement.
Market Price halfway between SBP and SSP	This is the position to be expected where there is linkage between spot prices and expected BM prices if suppliers are aiming to balance. If suppliers are in that situation then the marginal value of an additional MWh in the spot market will be set at a value where a supplier would make as much money by buying it when short as they would lose by buying it when long.
Market Price low	This is the current situation where, regardless of how high SBP reaches, spot prices are trading at the same rate, some £10 above SSP.
Market price above SBP	This will be a relatively frequent experience where market price is set before gate closure while SSP/SBP are set according to actions in the BM (with frequent defaults).
Market price below SSP	This is likely to be a less frequent experience and will mainly occur when a high default price is set. If SSP is negative then this cannot happen because market price cannot go negative.

Table 2: Main first order results

Scenario 1: Cases where gross party imbalances exceed gross system imbalances

	Market Price halfway between SBP and SSP		Market Price low		Market Price above SBP		Market Price below SSP	
	System Long	System Short	System Long	System Short	System Long	System Short	System Long	System Short
	£/MWh							
SBP original	*100.00*	*100.00*	*100.00*	*100.00*	*20.00*	*20.00*	*100.00*	*100.00*
Shortfall price	19.00	100.00	26.00	100.00	9.00	20.00	28.40	100.00
Market Price	55.00	55.00	20.00	20.00	25.00	25.00	8.00	8.00
Spill Price	10.00	91.00	10.00	98.00	10.00	17.00	10.00	100.40
SSP original	*10.00*	*10.00*	*10.00*	*10.00*	*10.00*	*10.00*	*10.00*	*10.00*

Scenario 2: Cases where gross party imbalances are less than gross system imbalances

	Market Price halfway between SBP and SSP		Market Price low		Market Price above SBP		Market Price below SSP	
	System Long	System Short	System Long	System Short	System Long	System Short	System Long	System Short
	£/MWh							
SBP original	*100.00*	*100.00*	*100.00*	*100.00*	*20.00*	*20.00*	*100.00*	*100.00*
Shortfall price	55.00	100.00	90.00	100.00	5.00	20.00	102.00	100.00
Market Price	55.00	55.00	20.00	20.00	25.00	25.00	8.00	8.00
Spill Price	10.00	55.00	10.00	90.00	10.00	5.00	10.00	102.00
SSP original	*10.00*	*10.00*	*10.00*	*10.00*	*10.00*	*10.00*	*10.00*	*10.00*

Scenario 3: Cases where default imbalance volumes kick in (BRL*)

	Market Price halfway between SBP and SSP		Market Price low		Market Price above SBP		Market Price below SSP	
	System Long	System Short	System Long	System Short	System Long	System Short	System Long	System Short
	£/MWh							
SBP original	*100.00*	*100.00*	*100.00*	*100.00*	*20.00*	*20.00*	*100.00*	*100.00*
Shortfall price	35.00	100.00	54.44	100.00	7.22	20.00	61.11	100.00
Market Price	55.00	55.00	20.00	20.00	25.00	25.00	8.00	8.00
Spill Price	10.00	87.50	10.00	97.22	10.00	15.83	10.00	100.56
SSP original	*10.00*	*10.00*	*10.00*	*10.00*	*10.00*	*10.00*	*10.00*	*10.00*

Table 3: Effect of negative SSP

Scenario 1: Cases where gross party imbalances exceed gross system imbalances

	Market Price halfway between SBP and SSP		Market Price low		Market Price above SBP		Market Price below SSP	
	System Long	System Short	System Long	System Short	System Long	System Short	System Long	System Short
	£/MWh							
SBP original	*100.00*	*100.00*	*100.00*	*100.00*	*20.00*	*20.00*	*n.a*	*n.a*
Shortfall price	1.00	100.00	6.00	100.00	- 11.00	20.00	-	-
Market Price	45.00	45.00	20.00	20.00	25.00	25.00	n.a	n.a
Spill Price	- 10.00	89.00	- 10.00	94.00	- 10.00	13.00	-	-
SSP original	*- 10.00*	*- 10.00*	*- 10.00*	*- 10.00*	*- 10.00*	*- 10.00*	*n.a*	*n.a*

Scenario 2: Cases where gross party imbalances are less than gross system imbalances

	Market Price halfway between SBP and SSP		Market Price low		Market Price above SBP		Market Price below SSP	
	System Long	System Short	System Long	System Short	System Long	System Short	System Long	System Short
	£/MWh							
SBP original	*100.00*	*100.00*	*100.00*	*100.00*	*20.00*	*20.00*	*n.a*	*n.a*
Shortfall price	45.00	100.00	70.00	100.00	- 15.00	20.00	-	-
Market Price	45.00	45.00	20.00	20.00	25.00	25.00	n.a	n.a
Spill Price	- 10.00	45.00	- 10.00	70.00	- 10.00	- 15.00	-	-
SSP original	*- 10.00*	*- 10.00*	*- 10.00*	*- 10.00*	*- 10.00*	*- 10.00*	*n.a*	*n.a*

Scenario 3: Cases where default imbalance volumes kick in (BRL*)

	Market Price halfway between SBP and SSP		Market Price low		Market Price above SBP		Market Price below SSP	
	System Long	System Short	System Long	System Short	System Long	System Short	System Long	System Short
	£/MWh							
SBP original	*100.00*	*100.00*	*100.00*	*100.00*	*20.00*	*20.00*	*n.a*	*n.a*
Shortfall price	20.56	100.00	34.44	100.00	- 12.78	20.00	-	-
Market Price	45.00	45.00	20.00	20.00	25.00	25.00	n.a	n.a
Spill Price	- 10.00	84.72	- 10.00	91.67	- 10.00	10.28	-	-
SSP original	*- 10.00*	*- 10.00*	*- 10.00*	*- 10.00*	*- 10.00*	*- 10.00*	*n.a*	*n.a*

Main conclusions – first order analysis

The following key points arise:

1. Negative SSP has no material affect on spreads or incentives.
2. Significant benefits result from being cashed out in the opposite direction to the system imbalance rather than through seeking to balance at market prices.
    - This does not apply where SBP is anticipated to be below market price – in this case the shortfall cost increases relative to the current situation. Similarly, where market price is below SSP then going short will cost more than under the current situation.
3. Price outcomes under the proposal are dependent on imbalance volumes and NGC throughputs:
    - Where party imbalances are significant relative to NGC trades, this has a dampening effect on the buy-sell spread.
4. First-order results indicate that the settlement prices will regularly fall outside the market price – i.e. parties would be better off taking that settlement price rather than taking the market spot price.
5. The biggest cost to parties is caused when their imbalance is in the direction of system imbalance.

Second order effects

The first order results imply that there is a significant benefit in taking a cash-out price that is in the opposite direction to system imbalance, rather than seeking to buy into balance at the market price. However, this is based on a comparison between an ex ante market position as against an ex post cash-out position. In reality, the incentive to balance has to be judged against expected imbalance prices rather than ex post results.

To calculate second order effects, expected prices must be estimated. The following scenarios are based on the different scenarios in Table 2.

The basic starting position for a reasonable Scenario is summarised in Table 4. The key features of the scenario are:

- Projected SBP is high relative to current market price;
- Participant imbalance magnitudes anticipated to be in line with overall system imbalances

Current situation

Under the current system the following steps can be expected:

1. A high anticipated system buy price relative to market price is a clear incentive for demand side to go long
2. This should reduce the probability of the system going short and will reduce the probability of any offer acceptances.
3. With a low probability of acceptance, offer prices will increase – to compensate for withholding power from the spot market in favour of the BM. For this reason, offer prices are likely to remain high with SBP not significantly moved.
4. However, the probability of a default price being set should increase.
5. System sell price will probably not move significantly but will, if anything, fall.
6. Tendency for the market price to increase, although current experience is that this should be muted.

Table 4: Scenario starting position

System Long

Participants		NGC			Expected system prices	
			Volume	Price	Current	P27
	MWh		*MWh*	*£/MWh*	*£/MWh*	
Short parties					100.00	26.00
metered	15,000	**System buys**	100	100.00		
contracted	15,500	**System sells**	- 600	10.00		
net	- 500	**Net**	- 500			
Long parties					10.00	10.00
metered	15,000					
contracted	14,000					
net	1,000					
		Market price		20.00		

System short

Participants		NGC			Expected system prices	
			Volume	Price	Current	P27
	MWh		*MWh*	*£/MWh*	*£/MWh*	
Short parties					100.00	100.00
metered	15,000	**System buys**	600	100.00		
contracted	16,000	**System sells**	- 100	10.00		
net	- 1,000	**Net**	500			
Long parties					10.00	98.00
metered	15,000					
contracted	14,500					
net	500					
		Market price		20.00		

P27 outcome

The outcomes are as follows:

1. Strong initial incentive to go long as the opportunity cost of doing so is perceived as small.
2. Market Price is likely to go up because sellers will value the energy at its spill price potential.
3. Market price should tend towards midway between the expected buy price and expected sell price because the more that the price rises above SSP, the bigger the differential between the spill price and the shortfall price.
4. As the market goes longer, there is an increased probability of facing the spill price – buying at a higher market price in order to spill is not a good proposition.
5. Net result is an incentive for the market to tend towards balance.

Conclusion

The current situation creates a degree of certainty that any short error will face SBP regardless of the system position. Because there has been a tendency to asymmetric price risk (which P18 will only partly address), there is an incentive to spill rather than balance.

P27 proposes a process with a flip-flop price risk that is likely to incentivise:

- Greater correspondence between market price and imbalance prices
- Market incentives to achieve a closer net balance.

ANNEX 9 – RESPONSES TO INITIAL CONSULTATION ON MODIFICATION PROPOSAL

See separate attachment.