04 April 2001

URGENT MODIFICATION REPORT

MODIFICATION PROPOSAL P03

Correction of Price Spikes Generated By De-Minimis NGC Purchases

Prepared by P03 Modifications Group on behalf of the Balancing and Settlement Code Panel

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1 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.

This Modification Report is addressed and furnished to the Gas and Electricity Markets Authority ('the Authority') and none of the facts, opinions or statements contained herein may be relied upon by any other person.

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

2 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 modification procedures culminate in a modification report to the Authority, which normally contains the Panel's recommendation on whether or not a proposed modification should be approved and a proposed date for its implementation, together with a detailed assessment of the proposal in question. The report forms the basis upon which the Authority will decide whether to approve, direct or reject a modification proposal.

The Transmission Company or ELEXON may recommend that a Modification Proposal be treated as urgent, subject to approval by the Authority. The procedure for progressing an Urgent Modification Proposal is set out in Sections F2.9 and B4.6 of the Code. These urgent procedures allow the normal modification procedures to be circumvented as necessary to fit with the urgency of the matter. In such cases, the Authority will confirm the timetable and procedure that should apply. The timetable and procedure directed by the Authority must be adhered to, along with any other special instructions. A statement containing the reasons why the Panel (or Panel Chairman) consider the Proposal should be treated as urgent must be included in the Urgent Modification Report, together with a description of the extent to which the procedure followed deviated from the normal modification procedure.

Depending on the urgency of the matter, it may not be possible to establish a Modification Group or undertake detailed assessment of the modification proposal. The level of detail and analysis presented in this Urgent Modification Report therefore represents the full extent of relevant information regarding the modification proposal that could be collated within the time available.

3 EXECUTIVE SUMMARY AND RECOMMENDATIONS

Modification Number 3 was raised in order to suggest changes to the BSC that would prevent the occurrence of price spikes when option fees paid by NGC for provision of reserve (and other balancing contracts) are included in the numerator of the energy imbalance price calculations, but there is a very small volume of accepted offers (or bids) in such periods.

It was recognised in considering the options for what changes to the energy imbalance price calculations may be effected as a consequence of this Modification, that changes to NGC's Balancing Services Adjustment Data Methodology Statement would necessarily be required. It is noted that these were being pursued in parallel by NGC and were outside the purview of the Modifications Group.

The allocation of such options fees over a very small volume of accepted offers has caused significant spikes in System Buy Price (SBP) in a number of Settlement Periods from the start of trading under NETA. Modification Number 3 proposed to limit the contribution of the option fees to System Buy Price to 25% of the price with a view to removing any distortion to imbalance prices, and consequently better meeting the relevant BSC objectives (as is required of all Modifications).

The Modification was progressed as an Urgent Modification to the BSC (as is discussed in Section 5 of this document). A Modifications Group meeting was held on 3rd April 2001 to discuss the Modification (more information on the detailed process followed in progressing the Modification is set down in Section 6 of this document).

The Modifications Group agreed that price distortions were being caused by the inappropriate treatment of option fees in the imbalance price calculations. They believed that the Applicable BSC Objectives as set out in Condition 7A of the Transmission Licence would be better achieved if changes were made in order to remove such distortions (this is discussed further in Section 7 of this document). The Modifications Group considered the proposed solution contained within the Modification Proposal plus a number of alternative options that delivered the intent of Modification number 3 and better met the relevant objectives of the BSC. Aside from the key aspects of the proposal of preventing such price spikes, the main issues that influenced the options considered were:

i) The fact that all Modifications considered would require NGC to modify the Balancing Services Adjustment Data (BSAD) Methodology Statement (produced in accordance with Condition 7B of the Transmission Licence). The mechanism for changing the BSAD Methodology Statement is outside the scope of the BSC and the remit of the Modifications Group;

ii) Whether or not, in the broader context of Transmission Licence objectives and BSC objectives, the proposed changes were necessary to ensure that option fees for such contracts were in some way included in energy imbalance prices; and

iii) The practicalities of a short-term implementation.

A number of options were discussed and assessed by the Modifications Group. A detailed analysis of these options and a rationale for the Panel recommendation is included in Section 7 of this document. The following summarises the discussion at the Modifications Group:

- The Modifications Group overwhelmingly supported the implementation of a short-term solution which was to disregard option fees entirely in the calculation of Energy Imbalance prices.

- Further to discussion at the Modification Group, the representative of the proposer of the Modification also supported this course of action (in preference to the original Modification Proposal).

- The general sentiment from those attending the Modification Group was that such option fees should not be included in imbalance prices in either the short term or in the longer term. However, it was recognised that in it's August 2000 Consultation document[1], Ofgem concluded that "… energy imbalance prices should, as far as possible, reflect the costs of all energy balancing costs whether incurred in the Balancing Mechanism or through energy balancing contracts purchased ahead of Gate Closure". Therefore, a number of solutions for including such fees in the imbalance price calculations, without causing significant price distortions, were considered.

- Based on an analysis of the effect on prices and consideration of the practical details of implementation of the proposed changes, the following conclusions were drawn:

  - The solution judged to best achieve BSC objectives that did incorporate option fees in the imbalance price calculations (the "Ex-Ante Capability Price" option) would be relatively cumbersome to implement immediately from a practical perspective. In order for it to be implemented more properly, it would require changes to BSC systems that would have timescale implications for implementation. A detailed impact assessment would be required to assess how this option could be implemented as a matter of urgency.

  - The option of disregarding option fees is simple to implement and (based on the data analysis available in the timescales for considering the Modification) appears to constitute a good approximation to the solution that did incorporate option fees, but which was less practicable to implement.

- Regarding implementation, the Modifications Group noted Ofgem's statement on NETA Imbalance Settlement arrangements issued on 3rd April, which stated that "If accepted, modifications to the Balancing and Settlement Code and Balancing Services Adjustment Data (BSAD) methodology would have effect from 00:00hrs am on 5 April 2001".

- The BSC Panel is invited to submit the following recommendations/observations to the Authority:

1.1.1.1

[1] "Initial proposals for NGC's system operator incentive scheme under NETA, A consultation document and proposed licence modifications", August 2000

1) No changes should be made to the BSC, Code subsidiary documents or associated systems in relation to Modification Number 3;

2) It is noted that NGC has proposed[2] two alternative revisions to the Balancing Services Adjustment Data Methodology Statement. The first of which supports disregarding option fees and second of which would be consistent with the Ex-Ante Capability Price option.

3) In accordance with F2.9.7 if an Urgent Modification is made as a result of this consultation and the resulting recommendation, the Panel will submit this modification to a review by a Modification Group to consider and report as to whether an alternative modification would better facilitate achievement of the Applicable BSC Objectives. The terms set by the Panel should state that the review should include whether the incorporation of Option Fee costs in Imbalance prices is required to achieve the BSC Objectives. It would be likely to be necessary to co-ordinate such a review with NGC in order to take into account any interactions with the Balancing Services Adjustment Data Methodology Statement.

1.1.1.1

[2] Additional information is available on the NGC website www.nationalgrid.com/uk (balancing services home page, what's new?)

4 DESCRIPTION OF PROPOSED MODIFICATION

The Modification, as proposed, is available on the ELEXON website (www.elexon.co.uk). Details of the Modification and the alternative proposals considered by the Modifications Group are described in Section 7 of this document.

A copy of the Modification Proposal is also included as Annex-3 of this document.

5 STATEMENT OF URGENCY

The Modification Proposal has been treated as urgent on the basis that the proposal seeks to ameliorate a perceived distortion in the imbalance price calculations. The implication of these circumstances is that the trading arrangements may be significantly impacted by such a distortion and any potential amelioration should be agreed upon at the earliest opportunity. The proposal to treat the Modification on an urgent basis was agreed by the Panel and endorsed by the Authority.

Given that it was perceived that a distortion in the energy imbalance pricing arrangements arises from the current allocation of option fees in the energy imbalance price calculations, it was believed that a failure to ameliorate the situation would necessarily perpetuate an undermining of the efficient operation of the trading arrangements. Therefore, any modification to remove any such distortion must better facilitate the meeting of the Applicable BSC Objectives in the Transmission Licence.

Given the possibility of a significant distortion in prices, it was considered that a failure to address this issue urgently would be inconsistent with the achievement of the Applicable BSC Objectives.

6 DETAIL OF PROCEDURE AND TIMETABLE FOLLOWED

The key steps that have been adopted are as follows:

- The BSC Panel Chairman was able to obtain the views of seven Panel Members all of whom supported the recommendation that the Modification Proposal be treated as urgent. This view was subsequently ratified by the Authority. The Authority also agreed the process and timescale as described below.

- Having obtained the necessary confirmations that the Modification Proposal should be treated as urgent, an initial assessment was prepared for consideration by a Modifications Group.

- This initial assessment was presented to the Modifications Group on the 3/4/01 and considered by the Group. The Group comprised ELEXON technical experts, NGC representatives, Ofgem representatives and industry experts; a full listing of members is given in Annex 2.

- Following discussion at the Modifications Group meeting, this Urgent Modification Report was drafted and issued for consultation on 3/4/01, with a request for comments by 4/4/01.

- Comments received as a result of the consultation will be considered and presented to the BSC Panel at its meeting of the 5/4/01. The BSC Panel will also consider whether to accept the draft Report and whether to make a recommendation to the Authority.

- Deviations from the normal Modifications process are as follows:

    - The Initial Written Assessment was presented directly to the Modifications Group, rather than to the BSC Panel.

    - The membership of the Modifications Group was agreed by the BSC Panel Chairman, rather than by the BSC Panel.

    - Representations of Parties and interested third parties were not obtained and assessed by the Modifications Group, but will be considered by ELEXON and presented to the BSC Panel, following the Modifications Group deliberations.

- No Assessment Report has been produced, but some analysis supporting the recommendations has been undertaken and is included in Section 7 and Annex 1 of this document.

7 RATIONALE FOR PANEL RECOMMENDATIONS

The Modifications Group did believe that the treatment of option fees in the energy imbalance price calculations was causing significant distortions in the values of System Buy Price in certain Settlement Periods. This occurred in Settlement Periods where the total quantity of accepted offers was small, the Buy Price Volume Adjustment was small (or zero) and the Buy Price Cost Adjustment was non-zero. It was also noted that it was possible for distortions to occur for similar reasons in the calculation of System Sell Price, but that this had not as yet happened as no option fees had to date been included in the relevant BSAD data that affected System sell Price.

The Modifications Group agreed that correcting the significant distortion in the price calculations would better facilitate the achievement of the relevant objectives of the BSC, in particular, the relevant objectives set down in Conditions 7A(3)(a) to (d) of the Transmission Licence.

The Modifications Group believed that the spurious prices were clearly not being set on an economic basis, and that they were having the effect of undermining market confidence. Furthermore, it was possible that because they placed very high and inappropriate costs on certain parties, they may result in a reduction in competition as companies may wish to withdraw from the market in order to avoid such levels of potential risk. As a consequence, the Modifications Group believed that removal of the price distortion would very obviously better achieve the Applicable BSC Objective in Condition 7A(3)(b).

Avoiding exposure to System Buy Price may be achieved by “spilling”. In order to achieve this, Parties can adjust their contractual position to ensure that they are “long”. For generation, this means that they would wish to under-contract (and deliberately spill), whereas for demand, this means that they would wish to deliberately over-contract. The distorted incentive to contract to a level other than the intended physical operating level was also perceived to be inconsistent with the Applicable BSC Objective in Condition 7A(3)(b). Furthermore, to the extent that contract levels are consistent with Physical Notifications prevailing at Gate Closure, the spurious prices provide an incentive for parties to deliberately deviate from their final physical notification position in order to avoid the possibility of being exposed to the spurious prices. This would be likely to disrupt the efficient, economic and co-ordinated operation of the Transmission System (thus undermining the Applicable BSC Objective in Condition 7A(3)(c).

The Modification seeks to correct the distortion created by the treatment of Balancing Service option fees in the imbalance prices. However, the proposed Modification may create another (less significant) distortion by arbitrarily capping the effect of the option fees. On the basis of this assessment, the Modifications Group considered alternatives which delivered the same intent. The underlying intent was taken to be the removal of the price distortions created by the existing arrangements for taking account of Balancing Service option fees in the imbalance price calculations.

Generic Mechanisms for Allocating Option Fees

There are a number of ways in which reserve (and other) option fees may be taken into account in the determination of energy imbalance prices. The degrees of freedom that are available in this area include:

i) What proportion of Option fees (if any) to include in the imbalance price calculation;

ii) If any, how this is to be pro-rated across Settlement Periods in the year. Sub-Options include pro-rating on:

a) expected or actual utilisation;
b) expected or actual capability (availability);
c) other – e.g. all MWh, peak Settlement periods etc;

iii) Whether any associated volume-term is used in the denominator of the imbalance price calculation. Sub-options include:

a) No additional volume (as is the case in the existing BSC Rules);
b) Volume based on contract option quantity;
c) Volume based on utilisation quantity.

iv) Whether to include the adjustment as a price adjustment or as a cost (and possibly volume) adjustment. This is partly contingent on iii).

Modification Proposal and Alternatives

The proposal as originally submitted (Modification Number 3) seeks to cap the maximum contribution that the option fee is permitted to make to the System Buy Price to 25%.

Given the degrees of freedom described above, there are, in theory, an infinite number of alternative ways in which the option fees could be taken into account in the price calculation. However, a number of specific alternative modifications have been considered which, it is believed, would deliver the same basic intent as Modification Number 3.
These are set down below:

1) **Disregard Option Fees -** Under this option, no adjustment to imbalance prices would be made as a consequence of option fees payable under balancing services contracts.

2) **Ex-Ante Utilisation -** Allocate the total annual contract option fee ex-ante on the basis of expected utilisation. Under this method, it would be necessary to forecast the expected times of contract utilisation. The total contract option fee would be pro-rated across the MWh of contract call off. The Buy Price Cost Adjustment would be changed to reflect the amount of the pro-rated option fee notionally allocated to the period, and the Buy Price Volume Adjustment would be changed to reflect the associated expected utilisation quantity.

3) **Ex-Post Utilisation -** Allocate the total annual contract option fee ex-post on the basis of actual contract call-off. As above, but base the pro-rata allocation on the basis of actual contract call off.

4) **Ex-Ante Capability Price -** Pro-rate the option payment across expected capability quantity. Under this method, the annual option payment would be pro-rated across the MWh of capability under the contract available in periods when the capability is provided. In this way a price (in £/MWh) would be determined and added to the value of Energy

Imbalance Price (the proposed BSC changes to support this proposal are set down in Section 8).

5) **Ex-Ante Capability Cost/Volume Adjustments –** Under this option, the option fees are pro-rated across Settlement Periods in which the contract is active, and added into BCA for such periods. The value of BVA is also increased in such periods by an amount equal to the capability of the contract (in MWh).

6) **Ex-Post Pro-Rated on Accepted Offer Volume** – Under this option, the option fees to be paid in relation to a particular period of time (for example a Settlement Day) are pro-rated across Settlement Periods in relation to the aggregate quantity of accepted offers in such periods.

Discussion of Options

Whilst all of the above options are likely to remove the effects of (some of) the recent price spikes there are a number of relative advantages and disadvantages between the options.

One significant issue is whether it is appropriate to include any option fees at all in the determination of imbalance prices. If some or all of the option fees were excluded from the calculation of energy imbalance prices at some stage, it would have the following effects:

i) NGC contract strategy (i.e. whether or not to include an option fee) would significantly affect the costs reflected in energy imbalance prices. If NGC purchased energy through the BM, or via a utilisation only contract, then the costs would be reflected in energy imbalance prices, if option fees were included, then some of the costs would not.

ii) The choice of the proportion of the costs to incorporate is somewhat arbitrary.

The Modifications Group overwhelmingly supported an initial approach to disregard all option fees in the energy imbalance price calculations.

If it were decided to include the option fees in the price calculation, two of the natural candidates over which to pro-rate the option fees are contract capability and contract utilisation. Either of these could be determined on an ex-ante or on an ex-post basis. From a utilisation perspective, ex-ante would be based upon when the contract was expected to be called, whereas ex-post would be on the basis of when the contract was actually called. From a capability perspective, ex-ante would be based upon when the capability to provide the service was expected to be made available, and ex-post would be on the basis of when it was made available.

It is assumed that in general ex-ante rather than ex-post allocations of costs are most appropriate. This is because if an ex-post allocation were chosen, significant price uncertainty could be introduced. Also, iterative calculations of the price adjustments would be required as data on actual utilisation became available.

It is also assumed that pro-rating based upon utilisation is undesirable. This is because it is possible that utilisation quantities could be (very) low, (actual utilisation could even be zero). Furthermore it is likely that basing the allocation on forecast utilisation would prove somewhat arbitrary. In the case of reserve contracts, the expected utilisation would be determined on a probabalistic basis. Whilst the total quantity of expected utilisation may be a reasonable forecast of actual utilisation, it is unlikely that the actual Settlement Periods in which the contract would be called would be properly predicted. Ex-ante allocation on a utilisation basis is therefore judged to be less attractive as an option.

Alternative allocations (such as all MWh) would be possible, but would clearly allocate costs to periods in which no service had been provided. Because this is the case, an allocation of costs over periods in which the capability to provide the service is in place is preferred.

Three options based on an ex-ante capability were considered in more detail. These three options were:

i) the Ex-Ante Capability Price;
ii) Ex-Ante Capability Cost/Volume Adjustments and
iii) E x-Post Pro-Rated on Accepted Offer Volume.

The relative merits of these options were discussed in some detail and were also studied as part of the data analysis carried out by NGC. In general, it was accepted that of these three options, the Ex-Ante Capability Price option should be selected (to the extent that any option fee is to be included at all). This was primarily because whilst the Ex-Ante Capability Cost/Volume Adjustment option was relatively trivial to implement, it resulted in significantly depressed prices in a number of Settlement Periods. This was caused by the fact that the denominator of the price calculation is made significantly larger by treating the option volumes in the same way as utilisation volumes.

The Ex-Post Pro-Rated on Accepted Offer Volume option was rejected partly because it required a post-event recalculation of prices, but more importantly because it did not guarantee that price spikes would necessarily be removed. Price spikes would still occur if, for example, very low quantities of offers were accepted over the entire Settlement Day.

Whilst it was generally agreed that the Ex-Ante Capability Price option did place undue weight on the adjustment from option fees at times of high prices, this effect was believed to be less significant than the relatively large distortions that may arise for small offer quantities under the Ex-Ante Capability/Cost Adjustment option.

Note that as discussed in the Executive Summary, further to debate in the Modifications Group, it was decided to recommend that option fees should be disregarded entirely in the price calculations. This option was favoured by the representative of the party who raised the original Modification over the proposal in the Modification. The three options discussed above were considered in the context of which option would be most suitable if it were necessary to develop a solution that included the entirety of the option fees in imbalance prices at some stage. Because the original Modification did not meet this criterion, it was not considered further in this context.

Practical Implementation

There are no practical issues associated with the recommended approach which relies on the separate process of changes to the Balancing Services Adjustment Data Methodology Statement. The changes to NGC's systems and process required to deliver the option of disregarding option fees is also perceived to be very simple to implement (NGC confirmed this at the Modifications Group meeting).

If it were proposed to adopt the Ex-Ante Capability Price option, then changes would need to be made both to the BSAD Methodology Statement and to the BSC. It is envisaged that in the short term, such an approach would be difficult to implement immediately from a practical perspective for the following reasons:

i) Without changing BSC systems, only the Buy Price Cost Adjustment (BCA) and Buy Price Volume Adjustment (BVA) may be amended in order to effect the required changes. The process of duplicating the effect of the Ex-Ante Capability Price option by only amending this data would be relatively cumbersome. It would, for example, be necessary to know the aggregate quantity of accepted offers, and the Transmission Loss Multipliers of associated BM Units in order to determine values of BVA and BCA required to be set. The data required to carry out the calculations only becomes available once a Settlement run has been carried out and so any adjustments would need to be made between Settlement Runs for a particular Settlement Day.

ii) A calculation would be needed following each Settlement run to the extent that the offer volume data (or more likely Transmission Loss Multipliers) changed in each Settlement Run.

iii) Relatively complicated off-line calculations would need to be carried out in relation to each Settlement Period in which option fees were to be taken into account (approximately 20 periods each Settlement Day). This introduces the possibility of error and may raise audit concerns.

An alternative approach which would simplify the calculations, and reduce the likelihood of recalculations being required following each settlement run would be to use values of $ETLMO_j^+$ (and, where necessary $ETLMO_j^-$) instead of the actual Transmission Loss Multipliers. However if this approach were adopted, it would be necessary to either recognise that the prices calculated by Settlement were not exactly in line with the BSC Trading Rules, or to write the BSC so that the trading rules explicitly included the values of ETLMO in the determination of the values of BCA and BVA from the BSAD data sent by NGC. Both these options are regarded as not being viable.

A final option would be to deliver the Ex-Ante Capability Price option via changes to the BSAD Methodology Statement alone, with no associated changes to the BSC. Such an approach would require NGC to undertake the complexities of calculating the required adjustments and would be outside the scope of the BSC.

Additional Issues

It was noted at the Modifications Group that it may be necessary to consider the interaction between any changes to the energy imbalance price calculations and NGC's incentive arrangements for managing the costs of BSUoS. Whether or not any changes were needed was recognised as being a matter that was clearly outside the scope of the Modifications Group.

It was further noted that NGC has largely finished its tendering process for standing reserve contracts for the current financial year. As this was the case, if it were decided to elect to adopt the recommended option of disregarding option fees, the scope of any concerns over NGC seeking to influence the costs that are reflected in imbalance prices via a particular contracting strategy is not anticipated to be significant.

The options and associated issues are summarised in Table 1 below.

Table 1 - Summary of Options and Associated Issues

	Impact on BSC*	Impact on BSC Systems	Impact on BSAD Methodology	Price Calculation	Issues
Modification proposal	Yes	Yes	No	$BOC_j = Min\{BOF_j, [0.25]* \sum_i\sum^n\{QAO^n_{ij} * PO^n_{ij} * TLM_{ij}\} + BCA_j – BOF_j\}$ $SBP_j = \{\sum_i\sum^n\{QAO^n_{ij} * PO^n_{ij} * TLM_{ij}\} + BCA_j - BOF_j + BOC_j\} / \{\sum_i\sum^n\{QAO^n_{ij} * TLM_{ij}\} + BVA_j\}$	i) 25% somewhat arbitrary ii) Not all option fees allocated to SBP/SSP iii) Non-trivial interim manual work-round with potential audit implications.
Disregard Option Fees	No	No	Yes	As per BSC, but with no option fees in BCA/SCA	i) NGC contract strategy affects composition of prices ii) Simple to implement in BSC iii) Changes to BSAD data required to remove option costs.
Ex-ante utilisation	No	No	Yes	As per BSC, but with pro-rated option fee reflected in BCA, and expected utilisation reflected in BVA.	i) Not clear how easy ex-ante utilisation is to forecast nor how accurate it will be. ii) Still potential for relatively large price adjustments iii) Simple to implement in BSC, but may cause issues in determination of BSAD from an NGC systems perspective. iv) Both expected and actual utilisation ultimately appear in the weighted average calculations if the BM Unit participates in the BM.

	Impact on BSC*	Impact on BSC Systems	Impact on BSAD Methodology	Price Calculation	Issues
Ex-Post Utilisation	No	No	Yes	As per BSC, but with additional pro-rated option fee in BCA. Where pro-rating is undertaken on the basis of actual utilisation.	i) Adjustments not finalised until year end (this is perceived as very undesirable). ii) Potential for large price adjustments iii) Potentially NGC Systems issues for determining BSAD.
Ex-Ante Capability Price	Yes	Yes	Yes	$SBP_j = BPA_j + \{\sum_i\sum^n\{QAO^n_{ij} * PO^n_{ij} * TLM_{ij}\} + BCA_j\} / \{\sum_i\sum^n\{QAO^n_{ij} * TLM_{ij}\} + BVA_j\}$ Where BPA_j is the Buy Price Price Adjustment (in £/MWh). This is equal to the total expected annual option fee payments divided by the total expected capacity in periods in which the contract is active. Similar changes would also apply for SSP. See Section 8.	i) Requires changes to both BSC and to BSAD data ii) Undue contribution to price calculation from option fees when large volumes of offers are accepted iii) Short-term “manual” implementation complex with potential audit implications.
Ex-Ante Capability Cost/Volume	No	No	Yes	As per BSC, with additional pro-rated option fee in BCA. Capability quantity (in MWh) would also be reflected in the value of BVA.	i) Simple to implement in the BSC on both an enduring and short-term basis. No changes to BSC systems or rules required. ii) Significant undue influence on price calculation from volume term adjustment in weighted average calculation when small volumes of offers are accepted.

	Impact on BSC*	Impact on BSC Systems	Impact on BSAD Methodology	Price Calculation	Issues
Ex-Post Pro-Rated on Accepted Offer Volume	Yes	Yes	Yes	$SBP_j = (\{\Sigma_i\Sigma^n\{QAO^n_{ij} * PO^n_{ij} * TLM_{ij}\} + BCA_j + \{COF_{jT}*\{\Sigma_i\Sigma^n\{QAO^n_{ij} * TLM_{ij}\} + BVA_j\}/\Sigma_{jT}\{\Sigma_i\Sigma^n\{QAO^n_{ij} * TLM_{ij}\} + BVA_j\}\})/\{\Sigma_i\Sigma^n\{QAO^n_{ij} * TLM_{ij}\} + BVA_j\}$ Where COF_{jT} is the contract option fee to be allocated in over the period T, and Σ_{jT} is the sum over all Settlement Periods in the period T in which the standing reserve contracts are "armed" – i.e. in which option payments are being made. BCA_j excludes option fees.	i) Ex-post calculation required ii) High option fees still possible if low quantities arise over the period T. Thus it does not guarantee that the solution will be delivered.

* See discussion above in Section 7 on Practical Implementation. This points out that it would, in principle, be possible to deliver all options via adjustments to the BSAD Methodology alone, rather than via changes to the BSC. However, there may be audit implications of taking this approach.

8 LEGAL TEXT TO GIVE EFFECT TO THE PROPOSED MODIFICATION

Recommended Approach

No changes to the BSC would be needed if the recommended solution of disregarding option fees were adopted.

Ex-Ante Capability Price in BSC

If it were proposed to adopt the Ex-Ante Capability Price option, and to effect the changes via the BSC, it is proposed that the following BSC changes would be required.

Section T – Replace Sections 4.4.5 and 4.4.6 as follows (bold text indicates changes from existing BSC):

4.4.5 In respect of each Settlement Period, if $\{\sum_i \sum^n \{QAO^n_{ij} * TLM_{ij}\} + BVA_j\}$ is not equal to zero then the System Buy Price will be determined as follows:

$SBP_j =$ **BPA_j** $+ \{\sum_i \sum^n \{QAO^n_{ij} * PO^n_{ij} * TLM_{ij}\} + BCA_j\} / \{\sum_i \sum^n \{QAO^n_{ij} * TLM_{ij}\} + BVA_j\}$

where $\sum_i$ represents the sum over all BM Units and $\sum^n$ represents the sum over those accepted Offers that are not Arbitrage Accepted Offers and not Trade Tagged Offers.

If for any Settlement Period $\{\sum_i \sum^n \{QAO^n_{ij} * TLM_{ij}\} + BVA_j\}$ is equal to zero, then **if BPA_j is not equal to zero, System Buy Price will be equal to BPA_j, otherwise**:

(a) if for that Settlement Period $\{\sum_i \sum^n \{QAB^n_{ij} * TLM_{ij}\} + SVA_j\}$ is equal to zero, the System Buy Price for that Settlement Period will be equal to zero;

(b) otherwise, the System Buy Price will be determined as the maximum of System Sell Price and:

(i) the Offer Price of the cheapest Offer available in that Settlement Period:

(1) which has a positive Bid-Offer Pair Number; and

(2) which has an Offer Price greater than the Offer Price of any Offer which is an Arbitrage Accepted Offer in respect of that Settlement Period; and

(3) for which the value of Bid-Offer Volume ($qBO^n_{ij}(t)$) is greater than zero for all spot times t in that Settlement Period;

(ii) or, if no such Offer exists, zero.

4.4.6 In respect of each Settlement Period, if $\{\sum_i \sum^n \{QAB^n_{ij} * TLM_{ij}\} + SVA_j\}$ is not equal to zero then the System Sell Price will be determined as follows:

SSP_j = $\mathbf{SPA_j}$ + $\{\sum_i \sum^n \{QAB^n_{ij} * PB^n_{ij} * TLM_{ij}\} + SCA_j\} / \{\sum_i \sum^n \{QAB^n_{ij} * TLM_{ij}\} + SVA_j\}$

where $\sum_i$ represents the sum over all BM Units and $\sum^n$ represents the sum over those accepted Bids that are not Arbitrage Accepted Bids and not Trade Tagged Bids.

If for any Settlement Period $\{\sum_i \sum^n \{QAB^n_{ij} * TLM_{ij}\} + SVA_j\}$ is equal to zero, then **if SPA_j is not equal to zero, System Sell Price will be equal to SPA_j otherwise**:

(a) if for that Settlement Period $\{\sum_i \sum^n \{QAO^n_{ij} * TLM_{ij}\} + BVA_j\}$ is equal to zero, the System Sell Price for that Settlement Period will be equal to zero;

(b) otherwise, the System Sell Price will be determined as the minimum of System Buy Price and:

(i) the Bid Price of the most expensive Bid available in that Settlement Period:

(1) which has a negative Bid-Offer Pair Number; and

(2) which has a Bid Price less than the Bid Price of any Bid which is an Arbitrage Accepted Bid in respect of that Settlement Period; and

(3) for which the value of Bid-Offer Volume ($qBO^n_{ij}(t)$) is less than zero for all spot times t in that Settlement Period;

(ii) or, if no such Bid exists, zero.

Add the following definitions in Table X2:

Buy Price Price Adjustment	BPA_j	£/MWh	The amount send by the Transmission Company as the 'Buy Price Price Adjustment' in accordance with Section Q6.3
Sell Price Price Adjustment	SPA_j	£/MWh	The amount send by the Transmission Company as the 'Sell Price Price Adjustment' in accordance with Section Q6.3

Amend Section Q6.3.2 as follows:

Q6.3.2 The Balancing Services Adjustment Data shall comprise the following data in respect of each Settlement Period:

(a) Sell Price Cost Adjustment SCA
(b) Sell Price Volume Adjustment SVA
(c) **Sell Price Price Adjustment SPA**
(c) Buy Price Cost Adjustment BCA
(d) Buy Price Volume Adjustment BVA
(e) **Buy Price Price Adjustment BPA**

ANNEX 1 – AVAILABLE SUPPORTING INFORMATION AND DATA

NGC has undertaken an analysis of the prices that would have been determined had the price calculations been carried out on the basis of a number of the options set out above.

The options for which the analysis has been carried out are as follows:

Option	NGC Reference
NGC approximate calculation of price based on existing BSC rules	Derived SBP
Value of SBP as reported on BMRS	SBP
Disregard Option Fees	Option 1
Ex-Ante Capability Price	Option 2
Ex-Ante Capability Cost/Volume	Option 3
Ex-Post Pro-Rated on Accepted Offer Volume	Option 4
Original Modification Proposal	Option 5

It is noted that NGC has produced the analysis presented in this section in the limited time available in order to support the progression of the Modification. It is recognised that the calculations are approximate partly because the data is based on data available to NGC and not formal Settlement Data and partly because the calculations have been undertaken on a spreadsheet and may not perfectly duplicate the BSC Trading Rules. The possibility of error in the data and/or analysis is also recognised.

The data provided by NGC relates to 29th March 2001. Some of the data has been presented graphically. The data in relation to all options is also included in the spreadsheet. The Excel Spreadsheet is provided as a separate file in conjunction with this Modification Proposal SBP_options_ext.xls.

The Modifications Group drew the following conclusions from the data:

i) The spurious nature of the existing treatment of the option fees is self-evident;

ii) None of the options removed the price spike in Settlement Period 15 which was not caused by allocation of BSAD option fees across small accepted offer volumes;

iii) Most of the alternative solutions delivered similar results, with the following general exceptions:

   a) Option 3 produced significantly lower prices in many periods, reflecting the additional volume in the denominator of the weighted averaging that this solution includes. It was generally considered that this solution was inappropriate.

   b) Option 5 produced values approximately 25% higher than the other solutions in a number of Settlement Periods, reflecting the 25% contribution from BSAD option fees.

ANNEX 2 – ATTENDEESS OF MODIFICATIONS GROUP

Urgent Modifications Group - MP3

Member	Organisation
Justin Andrews	Chairman (ELEXON)
Tony Dicicco	PowerGen
Ben Willis	Yorkshire Electricity
Ian Moss	APX
Martin Mate	British Energy Group
Mike Calviou	NGC
Steve Wilkin	St Clements Services
Paul Mott	London Electricity
Libby Glazebrook	Edison Mission Energy
Maurice Smith	Campbell Carr
John Stewart	Campbell Carr
Mark Trott	BGT
Andrew Murray	Axia Energy
Paul Mott	London Electricity
Nick Simpson	Ofgem
Ilesh Patel	Caminus
Sonia Brown	Ofgem
John Greasley	NGC
Paul Dawson	Enron
John Lucas	ELEXON
Neil Cohen	NETA Programme/ELEXON
Richard Haigh	NETA Programme/ELEXON
Gwilym Rowlands	ELEXON
Nick Durlacher	Panel Chairman (observer)

ANNEX 3 - COPY OF MODIFICATION PROPOSAL

Modification Proposal	**MP No: P3** *(mandatory by BSCCo)*

Title of Modification Proposal *(mandatory by proposer)*:

Correction Of Price Spikes Generated By De-Minimis NGC Purchases

Submission Date *(mandatory by proposer)*: 27 March 2001

Description of Proposed Modification *(mandatory by proposer)*:

1. NGC's Balancing Services costs in a period that are part of BCA but are not associated with a direct energy purchase (i.e. Aggregated standing reserve option fees + Aggregated Firm regulating reserve option fees) should be included as an entity in the BSC as "Buy Option Fees" (BOF).

2. Whenever the contribution of BOF to the SBP is greater than [25]% this contribution should be capped at [25]%.

3. A new entity "Buy Option Cost" (BOC) should be the Buy Option Fees capped at [25]% of SBP.

(Algebra attached)

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

The issue was pointed out by the BRL Subgroup in BSCP 11/10 ISSUES ASSOCIATED WITH THE PRICE SETTING MECHANISM IN THE BALANCING AND SETTLEMENT CODE (attached).

In a period where NGC is carrying Standing Reserve, if - because the system is basically long, NGC purchases only a small amount of energy then - the resultant SBP can be extremely high.

On 27th March the NGC BCA was set at £2,333.51 per period, for 14 hrs of the day. The smallest recorded non-zero total trade in a period was 1.403MWh of system sell (at 15:30). Given that there is no reason to expect system buy volumes to be signifficantly different from sell volumes, a system buy of 1.403MWh in a period where Standing Reserve fees applied would generate a price of £1,663.23/MWh. This level of price spike can be expected as a regular, perhaps daily occurance, with NGC occasionally buying less than 1MWh (for example, a buy finishing 1 minute after the start of a period could feasibly mean an energy purchase of 1/120MWh hence a price of £280,021.20/MWh).

This undue and unnatural price volatility is a function of NGC's prudent purchase of Standby Reserve, and their acceptance of BM Offers to minimise cost (not price) within a price mechanism that needs further development.

Impact on Code *(optional by proposer)*:

Impact on Core Industry Documents *(optional by proposer)*:

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

Modification Proposal	MP No: P3 *(mandatory by BSCCo)*

Impact on other Configurable Items *(optional by proposer)*:

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

The Applicable BSC Objective is:

BSC Section B1.2.2 (b) (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 (as defined in the Transmission Licence) of electricity;

Spurious price spikes raise the cost of risk and hence act as a barrier to new entrants.

Details of Proposer:

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Attachments: YES

If Yes, Title and No. of Pages of Each Attachment:

De-minimis Price Spike Algebra - 1page

BSCP 11/10 ISSUES ASSOCIATED WITH THE PRICE SETTING MECHANISM IN THE BALANCING AND SETTLEMENT CODE (attached) - 4 pages