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ASSESSMENT REPORT

MODIFICATION PROPOSAL P90 – Improving the Representation of Energy Balancing Actions in Cashout Prices

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

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c Related Documents

Reference	Document
Reference 1	Modification Proposal P90 'Improving the Representation of Energy Balancing Actions in Cashout Prices' 8 July 2002
Reference 2	Initial Assessment of Modification Proposal P90 'Improving the Representation of Energy Balancing Actions in Cashout Prices' (P090IR, V1.0, 18 July 2002)
Reference 3	Assessment Report Modification Proposal P74 'Single Cost-reflective Cash-out Price' (P074AR, V1.0, 18 July 2002)
Reference 4	Modification Report Modification Proposal P74 'Single Cost-reflective Cash-out Price' (P074RR, V1.0, 16 August 2002)
Reference 5	Assessment Report Modification Proposal P78 'Revised Definition of System Buy Price and System Sell Price' (P078AR, V1.0, 18 July 2002)
Reference 6	Modification Report Modification Proposal P78 'Revised Definition of System Buy Price and System Sell Price' (P078RR, V1.0, 16 August 2002)
Reference 7	Modification Proposal P90 'Improving the Representation of Energy Balancing Actions in Cashout Prices' Consultation Questionnaire (P090AC10, FINAL, 16 August 2002)

Reference	Document
Reference 8	Modification Proposal P90 'Improving the Representation of Energy Balancing Actions in Cashout Prices' Requirements Specification (P090AS, V1.0, 14 August 2002)
Reference 9	Modification Proposal P90 'Improving the Representation of Energy Balancing Actions in Cashout Prices' Supporting Consultation Document: Data Analysis (P090AZ, FINAL, 16 August 2002)
Reference 10	Modification Proposal P79 'Revised Rules for Default Energy Imbalance Pricing' 12 April 2002
Reference 11	Definition Report Modification Proposal P79 'Revised Rules for Default Energy Imbalance Pricing' (P079DR, V1.0, 11 July 2002)

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1 SUMMARY AND RECOMMENDATIONS

1.1 Recommendations

The Pricing Issues Modification Group (PIMG) recommends that the BSC Panel should grant a one month extension to the Assessment Procedure for Modification Proposal P90, for the reasons set out in this draft Assessment Report.

However, the PIMG recognise that the Panel may not be minded to grant such extension and therefore, the provisional recommendations from the PIMG to the Panel are set out as follows:

On the basis of the analysis, consultation and assessment undertaken in respect of this Modification Proposal during the Assessment Phase, and the resultant findings of this report, the Modification Group recommends that the BSC Panel should:

- Recommend to the Authority that Alternative Modification P90 should be made;
- If an Authority decision is made by 1 April 2003 the Implementation Date should be 3 November 2003. If an Authority decision is received after this date, but before 1 July 2003, the Implementation Date should be 4 February 2004; and
- Note the (approximate) development and implementation costs from the Alternative Modification of £755,400, BSC Central Service Agent costs. This cost excludes ELEXON effort (250 man days).

- Recommend to the Authority that the Proposed Modification P90 should not be made;
- However, if the Authority determine that the Proposed Modification should be made, the Implementation Date should be 3 November 2003, if an Authority decision is received by 1 April 2003. If an Authority decision is received after this date, but before 1 July 2003, the Implementation Date should be 4 February 2004; and
- Note the development and implementation costs from the Proposed Modification of £755,400, from BSC Central Service Agent costs. This cost excludes ELEXON effort (250 man days).

1.2 Background

Modification Proposal P90 'Improving the Representation of Energy Balancing Actions in Cashout Prices' (Reference 1) was raised by First Hydro Company on 8 July 2002. The Initial Written Assessment for Modification P90 (Reference 2) was considered at the Panel meeting of 18 July 2002, where the Panel agreed to submit Modification Proposal P90 to a two month Assessment Procedure.

The Panel noted that Modification Proposal P90 seeks to address similar issues to those dealt with under Modification Proposals P74 'Single Cost – reflective Cash-out Price' (Assessment and Modification Reports, References 3 and 4) and P78 'Revised Definition of System Buy Price and System Sell Price' (Assessment and Modification Reports References 5 and 6). The Modification Report for each of Modification Proposals P74 and P78 is with the Authority for decision. However it was acknowledged that the assessment of Modification Proposal P90 could take into consideration some of the assessment undertaken on Modification Proposals P74 and P78 as a consequence of the similar issues involved.

The Panel also agreed that the Pricing Issues Modification Group (PIMG) should undertake the Assessment Procedure for Modification Proposal P90, as the PIMG had undertaken the assessment of Modification Proposals P74 and P78 and were therefore familiar with the issues.

Modification Proposal P90 proposes to calculate Energy Imbalance Prices from price ordered stacks of all Bid Acceptances and all Transmission Company forward trade sales, and all Offer Acceptances and Transmission Company forward trade purchases. After Arbitrage Tagging, the volume on the smaller stack is tagged off of the bigger stack to the level of the Balancing Reserve Limit (BRL).

The 'main' Energy Imbalance Price is then a weighted average of the balancing actions (Bid – Offer Acceptances and Transmission Company forward trades) that comprise the Remaining Imbalance Volume (RIV). The BRL concept is retained for the 'reverse' price at the level determined from time to time by the Authority.

The aim of the Modification Proposal is to introduce a mechanism for better differentiating system and energy balancing, by stacking all Bid – Offer Acceptances and Transmission Company forward trades and using the Trading Tagging process for differentiation; all system balancing trades are deemed to be those which are Trade Tagged and energy balancing trades are those which remain after Trade Tagging. Additional aims of the Modification Proposal are to simplify the Energy Imbalance Price calculation and to improve transparency of the composition of the calculation.

During the Assessment Procedure, the PIMG met four times (on 24 July 2002, 7 and 28 August 2002, and 3 September 2002). One consultation was issued on 16 August 2002 (responses received 27 August 2002). One impact assessment (detailed level) was requested from the BSC Central Service Agent, BSC Parties and ELEXON on 14 August 2002 (M0009, responses received 23 August 2002).

The PIMG met to agree the recommendations with regards to Modification Proposal P90, and any Alternative at its meeting of 3 September 2002. The PIMG agreed that a request for a one month extension should be made to the Panel meeting of 12 September 2002, for the following reasons:

1. A new option (Option 6, section 5.6) has been identified that should go forward as a potential Alternative Modification to Proposed Modification P90. However, Option 6 has not been fully considered and assessed by the PIMG, nor has it been subject to an Impact Assessment from the BSC Central Service Agent;

2. The PIMG considered the Detailed Level Impact Assessment (DLIA) from the BSC Central Service Agent and raised concerns on the costs and timescales quoted, when compared to the costs and timescales provided for other similar pricing Modifications. Therefore the PIMG requested that further investigation be carried out on the costs and timescales provided; and

3. The PIMG are limited to assessing Modification Proposal P90 (and any Alternative) against the current baseline. The PIMG raised concerns regarding the assessment of Modification Proposal P90 being limited to the current baseline, given that two significant Pricing Modifications (Modification Proposal P74 (References 3 and 4) and Modification Proposal P78 (References 5 and 6)) are currently with the Authority pending decision. The Authority representative at the PIMG meeting indicated that an Authority decision would be made in respect of Modification Proposals P74 and P78 on Friday 6 September 2002.

   Therefore the PIMG agreed that Modification Proposal P90 (Proposed and Potential Alternative) should be assessed against the baseline revised (or not, as the case may) in light of the Authority decision on other Pricing Modifications.

The PIMG recognised that the Panel may not be minded to grant the extension to the Assessment Procedure for Modification Proposal P90, and therefore the PIMG considered the potential options available:

1. Recommend that the Proposed Modification should not be made, and recommend 'Option 6' as the Potential Alternative to Modification Proposal P90; and

2. Recommend that the Proposed Modification should not be made, do not propose an Alternative and provide the issues raised by Modification Proposal P90 to the Pricing Issues Standing Group for consideration.

However, the majority of the PIMG believe that Option 6 has some merit as a Potential Alternative, and should be further assessed. However, if the requested extension is not granted, and the opportunity for further assessment is not available, the majority of the PIMG agreed that the preferred way forward would be to recommend Option 6 as an Alternative. Therefore the PIMG agreed their (provisional) recommendations with regards to Proposed Modification P90 and its Alternative, noting that the assessment of the Alternative could be deemed to be incomplete under the requirements of Section F 2.6 of the Code.

1.3 Rationale for Recommendations

The Proposer asserts that the rationale behind Proposed Modification P90 is as follows:

- Removal of arbitrary judgements as to whether a balancing action is taken for system or energy balancing purposes;

- Implementation of consistent treatment of Transmission Company forward trades and Bid – Offer Acceptances;

- Improval of the transparency of the Energy Imbalance Price calculation and composite balancing actions; and

- Simplification of the perceived over complexity of the Energy Imbalance Price calculations.

Proposed Modification P90 seeks to remove the application of (perceived) arbitrary judgements as to whether balancing actions were taken for the purposes of system or energy balancing. In the case of a Bid – Offer Acceptance, this is currently achieved by the application of the Continuous Acceptance Duration Limit (CADL), and with regards to Transmission Company forward trades, an assessment is currently made by the Transmission Company as to the purpose of the trade, with those trades deemed to have been for energy balancing purposes subsequently notified as BSAD.

Proposed Modification P90 proposes to remove the application of the Continuous Acceptance Duration Limit (CADL) and to remove the assessment of the Transmission Company as to the purposes of the forward trade. Instead, Proposed Modification P90 proposes to stack all Bid – Offer Acceptances and all (individual) Transmission Company forward trades and use the Trading Tagging process for energy and system balancing differentiation; all system balancing trades are deemed to be those which are Trade Tagged and energy balancing trades are those which remain after Trade Tagging (see section 4).

The Proposer asserts that this approach will also create consistency in the way Bid – Offer Acceptances and Transmission Company forward trades are treated by the Energy Imbalance Price calculation, by disaggregating the forward trades and using them in the Energy Imbalance Price calculation in the same manner as Bid – Offer Acceptances.

The Proposer believes that additional benefits of this approach are:

- Simplification of the Energy Imbalance Price calculation; and
- Improvement in the transparency of the Energy Imbalance Price calculation, by the simplified approach to the calculation and by reporting and use of individual (disaggregated) Transmission Company forward trades.

It should be noted that in order to support the mechanism proposed by Proposed Modification P90, an associated amendment to Balancing Services Adjustment Data (BSAD) is required, in order that all Transmission Company forward trades (energy and system) are provided as individual trades (i.e. disaggregated) into the BSC Central Service Agent for reporting and use in the Energy Imbalance Price calculation.

The Panel has indicated in the past, during consideration of various Modification Proposals, that Modification Proposals in the Assessment Procedure should be assessed against the current baseline, and against the current baseline incorporating Modification Proposals approved by the Panel, pending Authority decision. Therefore given that the Panel has recommended to the Authority that Alternative Modification P74 (Reference 4) and Alternative Modification P78 (Reference 6) should be made, and given that at this time the Authority decisions are pending, these Modifications could be considered to be part of a baseline against which Modification Proposal P90 should be assessed (noting that the major part of the assessment of Modification Proposal P90 should be against the current baseline).

However, the Authority representative (at the PIMG Meeting of 3 September 2002) noted that such a direction from the Panel should be considered to be ultra vires, and that the PIMG should assess the Modification Proposal (and any Alternative) against the current baseline only, i.e. the current arrangements plus any Modifications pending implementation following Authority approval.

The Authority representative indicated that the PIMG were free to make any comparisons that they believed appropriate, but indcated that the Authority would only take assessments made against the current baseline into consideration when making a decision on the Modification.

The PIMG raised concerns regarding the assessment of Modification Proposal P90 being limited to the current baseline, given that two significant Pricing Modifications (Modification Proposal P74 (References 3 and 4) and Modification Proposal P78 (References 5 and 6)) are currently with the Authority pending decision. The PIMG made a comparison of Modification Proposal P90 against the pending Modification Proposals, however, it was acknowledged that any comparison made in the time available (i.e. the remainder of the existing Assessment Procedure) would be relatively uninformed.

The Authority representative at the PIMG meeting of 3 September 2002 indicated that an Authority decision would be made in respect of Modification Proposals P74 and P78 on Friday 6 September 2002.

Therefore the PIMG agreed that the most appropriate way forward would be for Modification Proposal P90 (Proposed and Alternative) to be assessed against the baseline revised (or not, as the case may) in light of the Authority decision on other Pricing Modifications.

The proposed mechanism for Modification Proposal P90 (Proposed and Alternative) is similar to the Net Imbalance Volume Tagging mechanism proposed for Modification Proposal P78 and Alternative Modification P74.

The Net Imbalance Volume Tagging mechanism proposed by Modification Proposals P74 (Alternative) and P78 nets all balancing actions off to derive a net imbalance Volume (NIV), which is deemed to be the energy imbalance volume of the overall system. Those balancing actions taken to alleviate the NIV are

deemed to have been taken for energy balancing purposes only, and therefore go forward to set the main Energy Imbalance Price.

This mechanism therefore deems all the volume on the smaller stack (i.e. the imbalance in the opposite direction to the overall energy imbalance of the system) and an equal and opposite amount on the larger stack to have been attributable to system balancing.

The P74 / P78 mechanism uses CADL'ed Bid – Offer Acceptances (i.e. those determined by the application of the Continuous Acceptance Duration Limit to have been for system balancing purposes) and net system BSAD volume (i.e. that volume determined by the Transmission Company to have been attributable to system balancing) to calculate the Net Imbalance Volume, but does not allow this volume to go forward to influence the Energy Imbalance Price. The mechanism also uses net BSAD volumes (i.e. either net sales or net purchases) in the mechanism in order to avoid 'misrepresentation' of BSAD volumes which could potentially occur under use of the gross reported BSAD volumes. This mechanism is explored further in the Assessment Reports for Modification Proposals P74 and P78 (References 3 and 5 respectively).

During assessment of the P74 / P78 mechanism, it was argued by some members of the PIMG that:

- Attributing the entire volume on the smaller (reverse) stack to system balancing had the potential to disregard trades (Bid – Offer Acceptances and Transmission Company forward trades) which were taken for energy balancing purposes;
- A move to net reported BSAD (as required by the proposed P74 / P78 mechanism) reduces transparency in the Transmission Company's forward trades (although it was noted that this was beyond the scope of the assessment of the Modification Proposals); and
- Continued application of the Continuous Acceptance Duration Limit created an overly complex solution.

Therefore the mechanism proposed by Proposed Modification P90 sought to address these issues.

The PIMG discussed the rationale behind Proposed Modification P90 and assessed the Modification Proposal in regards to the options proposed as an Alternative (section 5), the Assessment Criteria identified as the key issues for consideration during the Assessment Procedure (section 7), the consultation responses (section 15) and against the Applicable BSC Objectives (section 9). The conclusions of the PIMG with regards to the Modification Proposal (both the Proposed and Alternative Modification P90) are set out in full in the sections referenced and are summarised in the following sections.

1.3.1 Proposed and Alternative Modification

The PIMG considered Modification Proposal P90 and defined five options for a potential Alternative Modification. These options are set out in full in section 5, but can be summarised as follows:

- Option1: Dynamic BRL (Real time): As for P90, but with the BRL determined dynamically by the Transmission Company on a Settlement Period by Settlement Period basis:
- Option 2: Dynamic BRL (Average): As for P90, but with the BRL determined by the Transmission Company as an average of that required over preceding Settlement Periods;
- Option 3: Reverse Price set from Main Stack: As for P90, but with BRL applied to the main (larger stack) to obtain the reverse price (i.e. main price set from the Remaining Imbalance Volume on the main stack and the reverse price set by balancing actions on the main stack to the value of BRL);

- Option 4: Reverse Price set from Main and Reverse Stack: As for P90, but with the reverse price derived from an average of the price derived from applying BRL to the main and the reverse stack (i.e. main price set from the Remaining Imbalance Volume on the main stack and the reverse price set by an average of the balancing actions on the main stack to the value of BRL and the balancing actions on the reverse stack to BRL); and
- Option 5: Reverse Price set from First Bid – Offer Acceptance on Main Stack: The main price set as defined for P90, with the reverse price being set from the first Non arbitrage Acceptance on the main stack.

The PIMG considered each of the options, taking into consideration the assessment consultation responses made in respect of each of these options and the BSC Central Service Agent Impact Assessment. The majority of the PIMG agreed that none of these Options could form a potential Alternative Modification, mainly as a consequence of the removal of the Continuous Acceptance Duration Limit (CADL) from all of the proposed mechanisms (and thereby not facilitating achievement of the Applicable BSC Objectives).

The PIMG considered a further possible option of the mechanism proposed by Proposed Modification P90 including CADL, but disregarded this on the grounds that the outcome would be a pricing methodology similar to the current baseline, but incorporating disaggregated Transmission Company forward trades. Therefore a number of the PIMG believed that any benefits of this approach would be outweighed by the cost of delivery and the increased complexity in defining system and energy balancing actions when compared to the mechanism proposed by Proposed Modification P90.

The PIMG considered another option, 'Option 6', which comprises the mechanism proposed by Option 5, but including the Continuous Acceptance Duration Level (CADL). The majority of the PIMG preferred Option 6 over the other potential options and believe, on initial consideration, that it has the potential to better facilitate achievement of the Applicable BSC Objectives than the Proposed Modification.

It should be noted that a number of PIMG members do not support Option 6. Some believe that Option 6 is not better than Proposed Modification P90, on the grounds that it loses the simplicity and consistency of treatment of balancing actions, which is the main intent of the Proposed Modification. Other members of the PIMG do not support Option 6, as they believe it to be as arbitrary as the Proposed Modification.

The PIMG noted that there was no time to undertake any real assessment of Option 6, as a consequence of it being identified at the PIMG meeting of 3 September 2002 (with the Assessment Report due to be submitted to the Panel meeting of 12 September 2002). On this basis, the PIMG identified three potential ways forward:

1. Request an extension of one month, to enable further assessment of the potential Alternative to Proposed Modification P90 (noting that there are other considerations which require further assessment);
2. Recommend that the Proposed Modification should not be made, and recommend 'Option 6' as the Alternative to Modification Proposal P90; and
3. Recommend that the Proposed Modification should not be made, do not propose an Alternative and provide the issues raised by Modification Proposal P90 to the Pricing Issues Standing Group for consideration.

The PIMG considered these options. The majority of the PIMG believe that Option 6 has some merit as an Alternative, and should therefore be further assessed. Therefore the PIMG agreed that a one month extension to the Assessment Procedure should be requested to enable assessment and analysis in respect of Option 6, as defined in Section F 2.6 of the Code.

However, the PIMG noted that the Panel may not be minded to grant such an extension. Therefore if the requested extension is not granted, and the opportunity for further assessment is not available, the majority of the PIMG agreed that the preferred way forward would be to recommend Option 6 as an Alternative, believing that, on initial consideration that it has sufficient merit. Therefore the PIMG agreed their (provisional) recommendations with regards to Proposed Modification P90 and its Alternative, noting that the assessment of the Alternative could be deemed to be incomplete under the requirements of Section F 2.6 of the Code.

1.3.2 Impacts and Incentives from the Proposed and Alternative Modification

The PIMG considered Proposed Modification P90 and Alternative Modification P90 against each of the Assessment Criteria defined in section 7. The conclusions made in respect of each of the Assessment Criteria and the Proposed and Alternative Modification are set out in section 7 of this Assessment Report, but the conclusions can be summarised as follows:

- A number of the PIMG believe that Proposed Modification P90 better achieves the differentiation of system and energy balancing actions than the current baseline, and therefore derives more cost-reflective Energy Imbalance Prices, as a consequence of the mechanism proposed by P90 removing the requirement for what could be considered to be arbitrary judgements by the Transmission Company and the application of the arbitrary Continuous Acceptance Duration Limit (CADL) to determine whether a balancing action was deemed to be for the purposes of system or energy balancing.
- Conversely, the majority of the PIMG believe that the removal of CADL required by Proposed Modification P90 does not better achieve the differentiation of system and energy balancing actions than the current baseline, as the current baseline uses non-arbitrary differentiation of system and balancing actions, via assessment by the Transmission Company and the application of CADL. However, a number of the PIMG consider that these differentiation methods are as arbitrary as the mechanism proposed by Proposed Modification P90.
- The majority of the PIMG believe that the removal of the current differentiation between system and energy balancing actions has not been justified by Proposed Modification P90, and that there is no justification as to why the removal of the current differentiation is more cost-reflective. Therefore the majority of the PIMG believe that the Energy Imbalance Prices resulting from the mechanism proposed by Proposed Modification P90 are less cost-reflective than those derived under the current baseline, as a consequence of the potential for inclusion of short duration (i.e. CADL'ed) Bid – Offer Acceptances in the Energy Imbalance Prices.
- It should be noted that the majority of the PIMG support the use of disaggregated BSAD in the Energy Imbalance Price calculations, on the grounds of improved transparency.
- The reverse price for Proposed Modification P90 is derived from the application of the Balancing Reserve Limit (BRL) to the smaller balancing action stack (as set out in section 4.1, Figure 4.1). The PIMG indicated that if it is believed that the Balancing Reserve Limit under the current baseline is cost-reflective, then it could be argued that Proposed Modification P90 is no more cost-reflective than the current baseline.

- However, the majority of the PIMG believe that if the removal of CADL is taken into consideration, then the reverse stack is potentially open to pollution from system balancing actions that would otherwise have been removed by the CADL mechanism (assuming CADL is set to an appropriate limit). It should be noted that the analysis undertaken for the period 2 to 14 July 2002 inclusive (section 8) does not wholly support the assertion that the Energy Imbalance Prices derived from the mechanism for Proposed Modification P90 are influenced by short duration Acceptances.
- Conversely, it could be argued that the inclusion of individual Transmission Company forward trades into the Energy Imbalance Price calculation means that such forward trades will mitigate the effect of the removal of CADL, such that balancing actions attributable to system balancing, such as short duration Bid – Offer Acceptances, should be Trade Tagged out of the stack.
- The PIMG noted that the targeting of the cost energy balancing actions to those causing the imbalance, is strongly linked to the issue as to whether the Energy Imbalance Prices can be considered to be reflective of the costs of energy balancing, i.e. if the Energy Imbalance Prices derived from Proposed Modification P90 can be considered to be more cost-reflective of the costs of energy balancing, then the Modification can be considered to be targeting the costs more effectively, with the converse also being true.
- Some members of the PIMG believe that the inclusion of all Transmission Company forward trades into the Energy Imbalance Price calculation may have the effect of reducing the potential spread in the Energy Imbalance Prices and having the effect of reducing asymmetric risk, and therefore of bringing the market closer to balance.
- A converse view, expressed by the majority of the PIMG, is that the Energy Imbalance Prices derived from the mechanism proposed by Proposed Modification P90 have the potential to be at least as volatile as the current baseline, if not more volatile, as the removal of the CADL mechanism may include more short duration Bid – Offer Acceptances in the Energy Imbalance Prices, noting the analysis undertaken in this respect, provided in section 8. Therefore the majority of the PIMG concluded that Proposed Modification P90 would, at best, be neutral to asymmetric risk and potentially could increase asymmetric risk.
- The PIMG believe that there will be no material change to the risk levels of different types of Parties. However, it was noted that if Energy Imbalance Prices become more volatile under the mechanism proposed by Proposed Modification P90, Parties with unpredictable usage (demand or generation) may be affected disproportionately as a result of the inability to forecast, and the increased risk of exposure to imbalance. Conversely, if Energy Imbalance Prices become less volatile, then these Parties may benefit.

1.3.3 Applicable BSC Objectives: Proposed Modification P90

The PIMG considered the conclusion reached on each of the Assessment Criteria (section 7) for Proposed Modification P90. On balance, the majority of the PIMG do not believe that Proposed Modification P90 better facilitates achievement of the Applicable BSC Objectives for the reasons set out in section 9, but summarised as follows:

It should be noted that the majority of consultation responses made in respect of the assessment consultation (section 15) believe that Proposed Modification P90 better facilitates the Applicable BSC Objectives.

The majority of the PIMG believe that Proposed Modification P90 does not create a better differentiation between system and energy balancing actions, and that therefore the resulting Energy

Imbalance Prices are consequently not any more cost-reflective of energy balancing actions than the current mechanism. Therefore, the majority of the reasons provided to support the majority opinion of the PIMG that Proposed Modification P90 does not better facilitate the Applicable BSC Objectives are based on this assertion.

Therefore it should be considered that if it is believed that Proposed Modification P90 creates a better differentiation between system and energy balancing actions, and that consequently the resulting Energy Imbalance Prices are more cost-reflective of energy balancing actions than the current mechanism, then these reasons for not facilitating achievement of the Applicable BSC Objectives can be reversed to indicate that the Proposed Modification does better facilitate the Applicable BSC Objectives.

However, as the majority of the PIMG do not believe that the mechanism proposed by Proposed Modification P90 gives more cost-reflective Energy Imbalance Prices (section 7, point (1)), then the reasons for it not facilitating the Applicable BSC Objectives are as follows:

- The reporting of disaggregated Transmission Company forward trades may improve transparency for BSC Parties, which may also incentivise the Transmission Company (system operator) to balance the market more efficiently and effectively;
- However, given the potential volatility in the Energy Imbalance Prices resulting from the removal of the Continuous Acceptance Duration Limit, the market is unlikely to come closer to balance, as the incentive is to over contract to reduce the risk of exposure to imbalance, therefore this may reduce the ability of the Transmission Company (system operator) to balance the market more efficiently and effectively;
- Following on from the above point, the potential for the reduced incentive on Parties to balance their positions ahead of Gate Closure, resulting from the incentive to over contract to protect from the risk of exposure to imbalance, may reduce the ability of the Transmission Company (system operator) to make informed decisions about balancing the system, thus reducing efficiency and economic operation. However, it should be noted that Proposed Modification P90 may be neutral to this incentive, on the grounds that it is potentially no worse than the current baseline in terms of incentivising over contracting to protect from exposure to imbalance;
- Any potential reduction in the cost-reflectivity of Energy Imbalance Prices may have the effect of reducing the accuracy of signals to the Transmission Company (system operator) and BSC Parties of the costs of balancing the system, thus potentially failing to promote the efficient, economic and co-ordinated operation of the Transmission System.
- As the Proposed Modification has the potential to increase the spread of the Energy Imbalance Prices , the risks of exposure to imbalance are at least equal to, and potentially higher than, the current baseline, thus potentially reducing competition in the sale and purchase of electricity;
- Any reduction in the cost-reflectivity of Energy Imbalance Prices means that there is the potential for the costs of energy balancing to be less correctly targeted at those causing the imbalance, thus potentially reducing competition by creating cross subsidies;
- The implementation of a potentially less cost-reflective cash-out regime may reduce the incentives on parties to balance their positions ahead of Gate Closure, which may have the affect of increasing the number of actions the Transmission Company (system operator) has to take to correct the imbalance of the system. Thus this potentially increases the role of centrally administered mechanisms and does not facilitate the bilateral trading of energy;

- An increase in the risk of exposure to imbalance may have the effect of discouraging Parties from trading closer to real time, thus reducing liquidity in the forwards and spot markets and reducing competition;
- Proposed Modification P90 introduces a level of simplicity into the Settlement calculations that may have the effect of improving efficiency in the implementation and administration of the balancing and settlement arrangements; and
- The Proposed Modification increases the administration costs of the balancing and settlement arrangements and this may outweigh any benefits of implementation of the Proposed Modification.

1.3.4 Applicable BSC Objectives: Alternative Modification P90 (Option 6)

The PIMG considered the conclusions reached on each of the Assessment Criteria (section 7) for the Proposed Modification, and applied them to Alternative Modification P90. On balance, the majority of the PIMG believe that Alternative Modification P90 better facilitates achievement of the Applicable BSC Objectives for the reasons set out in full in section 9, but summarised as follows:

It should be noted that the majority of the reasons provided to support the assertion that Alternative Modification P90 better facilitates the Applicable BSC Objectives, are based on the assertion that Alternative Modification P90 better differentiates between system and energy balancing actions than the current mechanism, and that therefore the resulting Energy Imbalance Prices are more cost-reflective of energy balancing actions than the current mechanism.

Conversely, if it is believed that Alternative Modification P90 creates a worse differentiation between system and energy balancing actions, and that therefore the resulting Energy Imbalance Prices are less cost-reflective of energy balancing actions than the current mechanism, then these reasons for better facilitating achievement of the Applicable BSC Objectives can be turned round to indicate that the Alternative Modification does not better facilitate the Applicable BSC Objectives.

However, as the majority of the PIMG believe that the mechanism proposed by Alternative Modification P90 gives more cost-reflective Energy Imbalance Prices (section 7, point (1)), then the reasons for it better facilitating the Applicable BSC Objectives are as follows:

- A proposed outcome of the Alternative Modification is that the market will come closer to balance, as a consequence of the potential reduction in the risk to exposure to imbalance. On this basis, the Transmission Company (system operator) should be able to balance the market more efficiently and effectively;
- The increased incentive for parties to balance their individual positions ahead of Gate Closure, resulting from the potential reduction in the risk of exposure to imbalance, should result in increased accuracy of information provided to the Transmission Company (system operator) ahead of Gate Closure, thus enabling it to make informed decisions about balancing the system, improving efficiency and economic operation;
- Improving the cost-reflectivity of the Energy Imbalance Prices should promote the efficient, economic and co-ordinated operation of the Transmission Network by providing more accurate signals to the system operator (and BSC Parties) of the costs of balancing the system;
- A proposed outcome of Alternative Modification P90 is that the buy – sell spread of the Energy Imbalance Prices will potentially be reduced, thus reducing the risks of exposure to imbalance, thus improving competition in the sale and purchase of electricity;

- Improving the cost-reflectivity of the Energy Imbalance Prices means that the cost of energy balancing is more correctly targeted at those causing the imbalance, and therefore this improves competition by preventing cross-subsidies;
- The implementation of a more cost-reflective dual cash-out price regime incentivises participants to balance their individual positions ahead of Gate Closure, therefore minimising the actions that the system operator has to take to correct the system energy imbalance. Thus, this assists in minimising the role of centrally administered mechanisms and facilitates the bilateral trading of energy; and
- Reduction in the risk of exposure to imbalance, whilst maintaining the incentives to balance, and therefore trade bilaterally, ahead of Gate Closure, may have the effect of encouraging participants to trade closer to real-time, with the associated effect of improving liquidity in the forwards and spot markets, thus increasing competition;
- Alternative Modification P90 introduces a level of simplicity into the Settlement calculations that may have the effect of improving efficiency in the implementation and administration of the balancing and settlement arrangements; and
- Alternative Modification P90 increases the administration costs of the balancing and settlement arrangements, but this is outweighed by the benefits of implementation of the Alternative Modification.

1.3.5 Implementation Aspects

The PIMG noted that the Detailed Level Impact Assessment from the BSC Central Service Agent quoted timescales as follows:

- Proposed Modification – 24 weeks development and implementation; and
- Alternative Modification –24 weeks development and implementation.[1]

ELEXON require a number of weeks following the BSC Central Service Agent development and implementation to complete full participant testing. It is envisaged that this will incur four to five weeks additional to the timescales quoted by the BSC Central Service Agent.

The PIMG agreed that, given the significance of the Modification and its Alternative, that any implementation should be undertaken at the earliest opportunity. The PIMG noted the current timetable of BSC Releases allows the Proposed and the Modification to be implemented as part of the November 2003 release, depending upon the date of Authority decision, and the PIMG agreed that this was the earliest practicable implementation date, although the PIMG requested that the development and implementation timescales be reviewed to determine whether the timescales could be shortened such that implementation could occur in the BSC Systems release of 24 June 2003.

It should be noted that the development and implementation of Modification Proposal P90, Proposed and Alternative, is dependent upon the development and implementation of the associated amendments to BSAD required in order to report the disaggregated Transmission Company forward trades as part of BSAD. There are two points of note in this respect:

1. There are no development and implementation costs provided by the Transmission Company for the requisite BSAD amendments. These will not be known by the Transmission Company until the BSAD consultation required for Modification Proposal P90 (Proposed and Alternative) has been

[1] Based on the PIMG assumption that Option 6 has no (material) differences over the costs and timescales quoted for Option 5.

undertaken. However, the Transmission Company have indicated that their timescales for development and implementation of the requisite amendments to BSAD would be in the region of three to six months, and it should be noted that this is well within the development time quoted by the BSC Central Service Agent; and

2. The Transmission Company are proposing that the requisite BSAD consultation be undertaken in parallel with the consultation on the Modification Report for Modification Proposal P90, following the Panel deliberations and provisional recommendations in regards to Modification Proposal P90.

1.4 Interaction with Modification Proposal P79

Modification Proposal P90 seeks to address perceived defects with the current Energy Imbalance Price calculation mechanism. During the Assessment Procedure the PIMG discussed the interaction of the mechanism proposed by Modification Proposal P90 with the Energy Imbalance Price default rules. The PIMG, with agreement from the Proposer of Modification Proposal P90, determined that Modification Proposal P90 did not address, or include, the Energy Imbalance Price default rules, and only applied to the calculation of Energy Imbalance Prices, other than under default circumstances. Therefore it was determined that the current default rules would apply under the same circumstances as currently defined.

This effectively means that if there is no volume (Bid – Offer Acceptance, or Transmission Company forward trade) on one of the stacks the default rules are invoked. This is also true of the situation where the Panel, with agreement from the Authority, set the Balancing Reserve Level to zero. Under this circumstance, one of the Energy Imbalance Prices, dependent upon the overall system length, would be defaulted.

Modification Proposal P79 'Revised Rules for Default Energy Imbalance Pricing' (References 10 and 11) is currently in the Assessment Procedure, being undertaken by the PIMG, and seeks to amend the Energy Imbalance Price default rules to make them more robust (i.e. suited to more frequent usage than they were originally proposed for) and more reflective of balancing actions that could have been taken by the Transmission Company.

It should be noted that Modification Proposal P90 can be implemented as well as Modification Proposal P79, and that there is no dependency between the Modification Proposals, although, given the point above regarding the retention of the existing default rules under Modification Proposal P90, Modification Proposals P90 and P79 could be considered to be complementary.

1.5 Issue with BSAD Reporting

An issue was identified with the mechanism proposed by the Transmission Company (the Proposer of P78) for the calculation and reporting of BSAD under Modification P78 (both the Proposed and the Alternative). The Modification Proposal required that the volumes associated with system balancing trades be included in the BSAD reported into the BSC Central Service Agent in order to derive a true Net Imbalance Volume. This is also true of the mechanism proposed for Alternative Modification P74.

The issue arises when the system operator undertakes system to system trades across the Interconnector with France. An example of these trades is when, overnight, the system operator has bid back gensets as far as their Stable Export Limits (SELs), but still needs to create downward regulation ("footroom"). The economic decision maybe for the Transmission Company and RTE to agree to deviate the Interconnector flow 'downwards' (reduced import) from the day ahead schedule.

The volume of deviation is then calculated and agreed (manually) over the next one to two working days (in accordance with BSCP04) (it should be noted that the volumes, by definition, are classed as system). Therefore these volumes currently, are not finalised until some time after real time. This means that the real time reported BSAD under Modification P78 does not include these volumes.

Analysis was undertaken (under Modification Proposals P74 / P78) to determine what materiality this has on the Net Imbalance Volume, and therefore the Energy Imbalance Price, and 20,000+ Settlement Periods were looked at. It was determined that these system to system trades have been undertaken for 15% of Settlement Periods, and are consistently for volumes in the order of 300 MWh. It was determined that for 2% of Settlement Periods (~400), not including these system to system trades in the Net Imbalance Volume calculation would have resulted in an overall system imbalance in the opposite direction to that calculated with the system to system trades.

As Modification Proposal P90 (Proposed and Alternative) also utilises system volumes in the calculation of Energy Imbalance Prices, the same issue will arise, and the resulting promptly reported Indicative Energy Imbalance Prices have the potential to be inaccurate through the omission of these system trades.

Therefore prompt price reporting (which would not include these volumes) would be inaccurate for 15% of Settlement Periods as a consequence of these trades. This is clearly unacceptable, given the importance placed on prompt and accurate price reporting.

The Transmission Company explored solutions to this issue under Modification Proposal P74 / P78, and believed that it would be possible to report these system to system trades promptly, such that the prices reported on the BMRA are accurate for the vast majority of Settlement Periods.

The Transmission Company believed that a robust automated solution could be available by any implementation in the BSC Systems 24 June 2003 release. However, if the Modification is implemented earlier, the Transmission Company believed that it could be possible to develop a (manual) workaround, as an interim solution, until the fully automated solution was developed and implemented, however it should be recognised that any manual workaround may not be as robust as the automated solution.

However, the Transmission Company indicated that there may not be an interim solution available by the February release. Therefore it should be recognised that, following the precedent set by Modification Proposal P18A, prompt price reporting could be inaccurate, under the circumstances outlined above, until such an interim workaround / automated solution is implemented.

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 MODIFICATION GROUP DETAILS

This Assessment Report has been prepared by the Pricing Issues Modification Group. The Membership of the Modification Group was as follows:

Name	**Organisation**
Justin Andrews	ELEXON (Chair)
Mandi Francis	ELEXON
Maurice Smith	Campbell Carr
Bob Brown	Cornwall Consulting
Paul Dawson	Barclays Capital
Libby Glazebrook	Edison Mission (Proposer)
Martyn Hunter	St. Clements Services
Sharif Islam	TotalFinaElf
Paul Jones	PowerGen
Danielle Lane	British Gas Trading
Richard Lavender	National Grid
Chris Leeds	Entergy - Koch Trading
Martin Mate	British Energy
Paul Mott	London Electricity Group
Ian Mullins	BP Gas, Power and Renewables
Andrew Murray	Entergy
Graham Oxley	RWE Trading Direct
Bill Reed	Innogy
Lisa Waters	Dynegy
Michael Wilks	Williams Energy
Ben Willis	Npower
Simon Bradbury / Anthony Doherty	Ofgem

4 PROPOSED MODIFICATION

4.1 Proposed Modification Overview

Proposed Modification P90 requires amendment to the mechanism for formulating and reporting BSAD trades and to the calculation of the Energy Imbalance Prices.

Currently, the energy proportion of forwards trades undertaken by the Transmission Company is reported (on a gross basis) as Balancing Services Adjustment Data (BSAD), for use in the Energy Imbalance Price calculation. BSAD values are used in the Energy Imbalance Price calculation after the Bid – Offer Acceptances for the Settlement Period have had CADL applied, and De Minimis Tagging, Arbitrage Tagging and Trade Tagging performed.

Modification P90 proposes that all forwards energy and system trades undertaken by the Transmission Company are reported individually into the BSC Central Service Agent and then used in the Energy Imbalance Price calculation as if they are Bid – Offer Acceptances for the purposes of Trade Tagging, i.e. stacked and then tagged out where appropriate (Figure 4.1 below).

Modification P90 proposes that all Bid – Offer Acceptances (after Arbitrage and De Minimis tagging has been applied) are stacked in price order (as shown in Figure 4.1 below) with individual (system and energy) BSAD trades included in the relevant points in the stack. The stacks then have Trade Tagging applied to the level of the Balancing Reserve Level. For the avoidance of doubt, this mechanism removes the requirement for the application of the Continuous Acceptance Duration Limit (CADL) to Bid – Offer Acceptances.

The proposed mechanism stacks all energy and system balancing actions, i.e. all Bid – Offer Acceptances and all system and energy (individual) BSAD trades, and then uses the existing Trade Tagging mechanism (i.e. tagging to the level of the Balancing Reserve Level (BRL)) to derive the Remaining Imbalance Volume (on the larger stack), and balancing actions to the level of BRL on the smaller stack.

The balancing actions taken to alleviate the Remaining Imbalance Volume are then used to calculate the main Energy Imbalance Price, and the balancing actions (to BRL) on the smaller (reverse) stack set the reverse Energy Imbalance Price. Where the Remaining Imbalance Volume is zero, or there is no volume on the smaller stack, then the current Energy Imbalance Pricing default rules are invoked.

For the avoidance of doubt:

- Where the system is long, the Bid (and Transmission Company forward sales) stack will be the main stack, and the main price will be the System Sell Price. The reverse stack will be the Offer (and Transmission Company forward purchase) stack and the reverse price will be the System Buy Price; and
- Where the system is short, the Offer (and Transmission Company forward purchase) stack will be the main stack, and the main price will be the System Buy Price. The reverse stack will be the Bid (and Transmission Company forward sale) stack and the reverse price will be the System Sell Price.

The Balancing Mechanism Reporting Agent (BMRA) will calculate and publish the Indicative Energy Imbalance Prices as defined above, to the currently defined schedule.

The Energy Imbalance Prices are calculated as defined above by the Settlement Administration Agent (SAA) and then applied to Energy Imbalance Volumes as currently defined.

It should be noted that the mechanism proposed by Proposed Modification P90 is based on the principle proposed by Proposed Modification P78 (Reference 5), where all (system and energy) balancing actions taken by the Transmission Company for a Settlement Period are netted off to leave a net energy imbalance (the Net Imbalance Volume (NIV)), which is deemed to be the energy imbalance of the system. This mechanism necessarily removes all of the smaller stack for the Settlement Period, deeming it to be for system balancing purposes.

Proposed Modification P90 uses a similar mechanism in terms of stacking all system and energy balancing actions (although the treatment of BSAD is different between the two Modifications), and undertaking some netting. However, the key feature of Proposed Modification P90 is that it assumes that some balancing actions taken in the opposite direction to the overall system imbalance were taken for energy balancing purposes, and that these should set the Energy Imbalance Price for application to imbalance volumes in the opposite direction to the overall system imbalance. The volume of balancing actions deemed to have been taken for energy balancing purposes is set by the Balancing Reserve Level (BRL).

Therefore Modification P90 deems that:

- Smaller (reverse) stack: Balancing actions to the level of BRL on the smaller (reverse) stack were taken for the purposes of energy balancing, with all other balancing actions in that direction being taken for system purposes; and
- Larger (main) stack: The volume of system actions on the smaller stack is netted off the larger (main) stack (see Figure 4.1 below) to leave the Remaining Imbalance Volume. Balancing actions taken to alleviate the Remaining Imbalance Volume are deemed to have been taken for the purposes of energy balancing. All other balancing actions (i.e. those netted off) in that direction are deemed to have been taken for the purposes of system balancing.

Thus Proposed Modification P90 implements a new differentiation between energy and system balancing actions for a Settlement Period. For the avoidance of doubt, this mechanism removes the requirement for (arbitrary) system balancing action differentiation via application of the CADL variable, as it undertakes the system / energy differentiation via Trade Tagging.

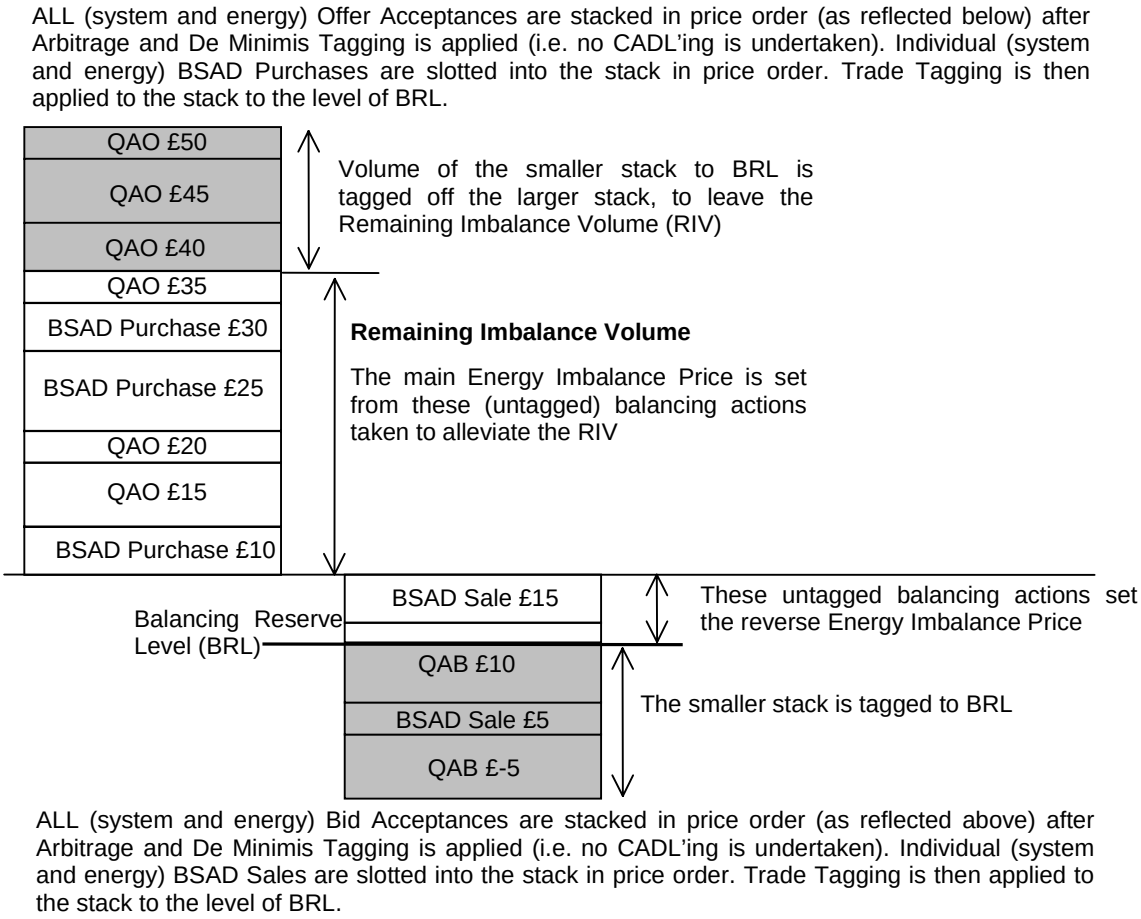


Figure 4.1: High Level Schematic of Proposed Mechanism under Modification P90.

4.2 Balancing Services Adjustment Data Amendments

Currently Balancing Services Adjustment Data (BSAD) is reported daily and comprises six data items, as defined in the BSC Section Q, 6.3, summarised as follows:

- Sell Price Cost Adjustment (SCA_j);
- Sell Price Volume Adjustment (SVA_j);
- Buy Price Cost Adjustment (BCA_j);
- Buy Price Volume Adjustment (BVA_j);
- Buy Price Price Adjustment (BPA_j); and
- Sell Price Price Adjustment (SPA_j).

This composition of BSAD includes all Transmission Company trades made for energy balancing purposes prior to Gate Closure, i.e. reporting on a gross basis.

However, in order to support Proposed Modification P90, all individual trades would have to be reported. The exact amendments to BSAD are yet to be defined / agreed by the Transmission Company, and are beyond the scope of this Assessment Report. However, for the purposes of

assessing the impact on the BSC Central Services and on other Parties, the following example of how BSAD could be reported is proposed.

It is expected that every trade relevant to a Settlement Period will be reported by the Transmission Company. It may be deemed appropriate to place a time constraint on the trades to be reported for a Settlement Period (for example, only trades made within two weeks prior to a specific Settlement Period are eligible for reporting and inclusion in the Energy Imbalance Price calculations), however, this is beyond the scope of this Assessment Report (and does not materially affect the impact of this Modification on the BSC Central Service Agent and Parties other than the Transmission Company).

Each trade would be required to have a reference / trade number for audit / verification purposes (use of contiguous references also assists in ensuring that no trades are missing). It is expected that the Transmission Company would report all the trades for a Settlement Period at Gate Closure for the relevant Settlement Period in a single report. The report can be utilised to report amendments to BSAD up to Final Reconciliation (as is the case currently).

The BSAD could be reported as follows (noting that this will require the existing interface between the Transmission Company and BMRA / SAA to be amended (or replaced with a new report)):

For the purposes of the following report:

- BC_j is the price (in £/MWh) of an individual BSAD forward purchase trade;
- BV_j is the is the volume (in MWh) of an individual BSAD forward purchase trade;
- SC_j is the price (in £/MWh) of an individual BSAD forward sale trade; and
- SV_j is the is the volume (in MWh) of an individual BSAD forward sale trade.

AMENDED BSAD VARIABLE REPORT (SAA-I023)

1-* Settlement Date

1-* Settlement Period

0-* Forward Sales

Trade Number

Sale Price (SC_j) (£/MWh)

Sale Volume (SV_j) (MWh)

0-* Forward Purchases

Trade Number

Purchase Price (BC_j) (£/MWh)

Purchase Volume (BV_j) (MWh)

Buy Price Price Adjustment (BPA_j)

Sell Price Price Adjustment (SPA_j)

This structure allows all trades for a Settlement Period to be reported into the BSC Central Service Agent. It should be noted that the Buy Price Price Adjustment (BPA) and Sell Price Price Adjustment (SPA) variables are retained as currently defined (and will be applied within the Energy Imbalance Price calculations as currently specified).

It should be noted that the BMRA will require amendment to report the BSAD in this revised format (to the same reporting schedules and service levels as currently in place). Amendments are also required to the Settlement Report (SAA-I014, all sub flows) to report the BSAD in this revised format (explored in section 4.3.5 of this Assessment Report).

This mechanism for reporting means that the naming and definition of the SCA, SVA, BCA and BVA variables changes from the current definition and there is potential for the variable name, acronym and definition to be amended to support the proposed reporting and utilisation. This will require changes to Section Q 6.3 of the BSC (and Section X), the exact nature of which cannot be determined until the BSAD changes and associated consultation is released by the Transmission Company.

It should be noted that the definition set out above has been adopted throughout the Assessment Report for the purposes of clarity and consistency.

4.3 Amendments to the Calculation of Energy Imbalance Prices

It should be noted that this section applies to the calculation of the Indicative Energy Imbalance Prices by the BMRA and to the calculation of the Energy Imbalance Prices by the SAA. The mechanisms and calculations undertaken by both BSC Systems is the same, and therefore the following section applies to both BSC Systems, unless specifically stated otherwise.

4.3.1 Calculation of the Remaining Imbalance Volume

Proposed Modification P90 requires that the Remaining Imbalance Volume of the overall system be determined and the main Energy Imbalance Price calculated from the balancing actions taken to alleviate the Remaining Imbalance Volume.

The Remaining Imbalance Volume, for a Settlement Period, is determined as follows:

- Acceptances are stacked, Offers on one stack and Bids on another, ordered according to price (as is done currently);
- De Minimis tagging will be undertaken on both stacks, as currently defined;
- Arbitrage Tagging will be undertaken on both stacks, as currently defined;
- Individual BSAD trades are added into the relevant stack – sales into the Bid stack and purchases into the Offer stack, placed within the stack in order of price by its £/MWh price i.e. as if each trade were a Bid – Offer Acceptance;
- Trade Tagging is then undertaken to the level of BRL.

The Energy Imbalance Prices are derived from the balancing actions remaining once the Trade Tagging has been undertaken, as shown in Figure 4.1.

Where there are no balancing actions on the reverse stack, then the current default rules for derivation of an Energy Imbalance Price are applied.

Where the Remaining Imbalance Volume is zero, then the current default rules for derivation of an Energy Imbalance Price are applied.

4.3.2 Calculation of the Energy Imbalance Prices

Once the Remaining Imbalance Volume has been determined, as defined in section 4.3.1, the Energy Imbalance Prices can be calculated for the Settlement Period.

All Bid – Offer Acceptances which have been Trade Tagged are disregarded for the purposes of setting the Energy Imbalance Prices.

All BSAD forward sales and purchases which have been Trade Tagged are disregarded for the purposes of setting the Energy Imbalance Prices.

For the purposes of the following calculations:

- BC_j is the price (in £/MWh) of an individual BSAD forward purchase trade;
- BV_j is the is the volume (in MWh) of an individual BSAD forward purchase trade;
- SC_j is the price (in £/MWh) of an individual BSAD forward sale trade; and
- SV_j is the is the volume (in MWh) of an individual BSAD forward sale trade.

Therefore, for each Settlement Period:

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

$$SBP_j = \{\{\sum_i\sum^n\{QAO^n_{ij} * PO^n_{ij} * TLM_{ij}\} + \sum^t(BV_j * BC_j)\} / \{\sum_i\sum^n \{QAO^n_{ij} * TLM_{ij}\} + \sum^t BV_j\}\} + \{BPA_j\}$$

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

If for any Settlement Period $\{\sum_i\sum^n \{QAO^n_{ij} * TLM_{ij}\} + \sum^t BV_j\}$ is equal to zero, then:

- If for that Settlement Period $\{\sum_i\sum^n \{QAB^n_{ij} * TLM_{ij}\}+ \sum^t SV_j\}$ is equal to zero, the System Buy Price for that Settlement Period will be equal to zero;
- Otherwise, the System Buy Price will be determined as the maximum of System Sell Price and:
  - The Offer Price of the cheapest Offer available in that Settlement Period, which has a positive Bid-Offer Pair Number and 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 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;
  - Or, if no such Offer exists, zero.

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

$$SSP_j = \{\{\sum_i\sum^n\{QAB^n_{ij} * PB^n_{ij} * TLM_{ij}\} + \sum^t(SV_j * SC_j)\} / \{\sum_i\sum^n \{QAB^n_{ij} * TLM_{ij}\}+ \sum^t SV_j\}\} + \{SPA_j\}$$

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

If for any Settlement Period $\{\sum_i\sum^n \{QAB^n_{ij} * TLM_{ij}\}+ \sum^t SV_j\}$ is equal to zero, then:

- If for that Settlement Period $\{\sum_i\sum^n \{QAO^n_{ij} * TLM_{ij}\} + \sum^t BV_j\}$ is equal to zero, the System Sell Price for that Settlement Period will be equal to zero;
- Otherwise, the System Sell Price will be determined as the minimum of System Buy Price and:
  - The Bid Price of the most expensive Bid available in that Settlement Period which has a negative Bid-Offer Pair Number and 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, 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;
  - Or, if no such Bid exists, zero.

4.3.3 Other Amendments Required to Support Proposed Modification P90

The amendments to the mechanism for calculating Energy Imbalance Prices have implications on other areas of the Settlement Calculations, specifically with reference to the removal of the requirement to apply the Continuous Acceptance Duration Limit (CADL) and the amendments to BSAD reporting and utilisation. The following reflects additional amendments required to support Modification P90.

- References to the Continuous Acceptance Duration Limit should be removed. This applies to Section T 3.1A and 3.1B of the Balancing and Settlement Code.
- Removal of the Continuous Acceptance Duration Limit means that the concept of Priced and Un-priced Bid – Offer Acceptances is no longer required. Therefore:
  - Determination of the Period Priced Bid – Offer Volume (Section T 3.8A) is no longer required (it is, in effect, replaced by T 3.8 which calculates the Period Accepted Bid – Offer Volume);
  - Determination of the Period BM Unit Total Priced Accepted Bid – Offer Volume (Section T 3.9A) is no longer required (it is, in effect, replaced by T 3.9 which calculates the Period BM Unit Total Accepted Bid – Offer Volume);
  - Determination of the System Total Un-priced Accepted Offer Volume (Section T 4.4.2B) is no longer required (it is, in effect, replaced by T 4.4.1 which calculates the System Total Accepted Offer Volume);
  - Determination of the System Total Un-priced Accepted Bid Volume (Section T 4.4.2C) is no longer required (it is, in effect, replaced by T 4.4.2 which calculates the System Total Accepted Bid Volume);
  - The determination of the Energy Imbalance Prices will no longer utilise Priced Acceptances (as set out in section 4.3.2);
  - In respect of each Settlement Period, the Total Accepted Priced Offer Volume, derived at T 4.4.7 will be amended as follows:

    The Total Accepted Untagged Offer Volume (i.e. the volume of Offers that are not Trade Tagged, (and therefore by implication not De Minimis Tagged, nor Arbitrage Tagged) is:

    $TUQAO_j = \sum_i\sum^n QAO^n_{ij}$

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

- In respect of each Settlement Period, the Total Accepted Priced Bid Volume, derived at T 4.4.8 will be amended as follows:

  The Total Accepted Untagged Bid Volume (i.e. the volume of Bids that are not Trade Tagged, (and therefore by implication not De Minimis Tagged, nor Arbitrage Tagged) is:

  $TUQAB_j = \sum_i \sum^n QAB^n_{ij}$

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

- In respect of each Settlement Period, the Total Arbitrage Volume (T 4.4.9) will be determined as follows:

  $TAQ_j = \sum_i (\sum^{n'} QAB^{n'}_{ij} - \sum^{n*} QAO^{n*}_{ij})/2$

  where $\sum_i$ represents the sum over all BM Units and $\sum^{n'}$ represents the sum over those accepted Bids that are Arbitrage Accepted Bids and $\sum^{n*}$ represents the sum over those accepted Offers that are Arbitrage Accepted Offers.

- Section T Annex T-1 requires amendment to Paragraph 1, 'Interpretation' to reflect that there is no longer the concept of Priced and Un-priced Bid – Offer Acceptances, as follows:

  Paragraph 1.1 should be deleted and flagged as [NOT USED], and 1.2 amended to read:

  For the purposes of this Annex T-1, and paragraph 4.4, in relation to a BM Unit and Settlement Period, an "**accepted Offer**" means the Period BM Unit Total Accepted Offer Volume (QAO^n_{ij}), and an "**accepted Bid**" means the Period BM Unit Total Accepted Bid Volume (QAB^n_{ij}) but excluding Offers and Bids where the value of Period BM Unit Total Accepted Offer Volume or Period BM Unit Total Accepted Bid Volume (as the case may be) is zero.

- Section T Annex T-1 requires amendment to Paragraph 1A, 'De Minimis Volumes' to reflect that there is no longer the concept of Priced and Un-priced Bid – Offer Acceptances, as follows:

  1A.1 In respect of each Settlement Period, De Minimis Accepted Offers and De Minimis Accepted Bids will be defined in the following way.

  (a) All accepted Bids for which $| QAB^n_{ij} | < DMAT_d$ shall be tagged as De Minimis Accepted Bids.

  (b) All accepted Offers for which $QAO^n_{ij} < DMAT_d$ shall be tagged as De Minimis Accepted Offers.

  1A.2 All accepted Bids and accepted Offers which are not De Minimis Accepted Bids and De Minimis Accepted Offers will be defined as Non-De Minimis Bids and Non-De Minimis Offers respectively.

- Section T Annex T-1 requires amendment to Paragraph 2, 'Arbitrage' to reflect that there is no longer the concept of Priced and Un-priced Bid – Offer Acceptances, as follows:

2.1 In respect of each Settlement Period, Arbitrage Accepted Offers and Arbitrage Accepted Bids will be defined in the following way.

2.2 If, for the highest priced accepted non-De Minimis Bid, QAB^g_{ij} (if any) which is not an Arbitrage Accepted Bid, there exists any accepted non-De Minimis Offer which is not an Arbitrage Accepted Offer QAO^n_{ij} for which it is true that $PO^n_{ij} \leq PB^g_{ij}$, then the following procedure will be carried out:

(a) All accepted Non-De Minimis Offers for which $PO^n_{ij} \leq PB^g_{ij}$ will be ranked in price order, cheapest first.

(b) The set of accepted Non-De Minimis Offers $\{QAO^{n1}_{ij}, QAO^{n2}_{ij}, \ldots, QAO^{nw}_{ij}\}$ is then a ranked set of accepted Offers for all of which it is true that $PO^{nw}_{ij} \leq PB^g_{ij}$.

(c) Then for all v such that

$$\Sigma^v QAO^{nv}_{ij} \leq - QAB^g_{ij}$$

where Σ^v is the sum over all ranked accepted Non-De Minimis Offers up to v,

the QAO^{nv}_{ij} will be defined as Arbitrage Accepted Offers and the fraction φ of QAB^g_{ij} which is equal to $\Sigma^v(-QAO^{nv}_{ij})$ will be defined as an Arbitrage Accepted Bid (this fraction may be one (1)).

(d) If:

$$\Sigma^v QAO^{nv}_{ij} < -QAB^g_{ij}$$

where Σ^v is the sum over all ranked accepted Non-De Minimis Offers up to v,

then, if a ranked accepted Non-De Minimis Offer, v+1 exists, the fraction γ of QAO^{nv+1}_{ij} which satisfies

$$\Sigma^p QAO^{nv}_{ij} + \gamma * QAO^{nv+1}_{ij} = - QAB^g_{ij}$$

will also be defined as an Arbitrage Accepted Offer and QAB^g_{ij} will be defined as an Arbitrage Accepted Bid. All accepted Bids and accepted Offers which are not Arbitrage Accepted Bids and Arbitrage Accepted Offers will be defined as Non-arbitrage Bids and Non-arbitrage Offers respectively.

2.3 The process in paragraphs 2.1 and 2.2 will then be repeated for the highest priced accepted Non-De Minimis Bid (if any) that remains a Non-arbitrage Bid.

2.4 If, for the purposes of carrying out the procedure in paragraphs 2.1 and 2.2:

(a) there are two or more accepted Non-De Minimis Bids that are Non-arbitrage Bids, that have the same highest Bid Price, or

(b) there are two or more ranked accepted Non-De Minimis Offers that have the same Offer Price

then one of the accepted Bids or (as the case may be) ranked accepted Offers will be selected at random.

2.5 If the completed application of paragraphs 2.1 to 2.4 inclusive (the 'initial calculation') would result in there being any accepted Non-De Minimis Bid or ranked accepted Non-De Minimis Offer which:

(1) is not an Arbitrage Accepted Bid or (as the case may be) Arbitrage Accepted Offer, but

(2) has the same price (other than merely by virtue of being a fraction (1 – γ) or (1 - φ) pursuant to the initial calculation) as an accepted Non-De Minimis Bid which is an Arbitrage Accepted Bid or (as the case may be) ranked accepted Non-De Minimis Offer which is an Arbitrage Accepted Offer,

then:

(i) all such accepted Non-De Minimis Bids QAB^{nr}_{ij} or ranked accepted Non-De Minimis Offers QAO^{nr}_{ij} (whether or not Arbitrage Accepted Bids or Arbitrage Accepted Offers on the basis of the initial calculation) which have the same price are "threshold Bids" or "threshold Offers";

(ii) no threshold Bid or threshold Offer shall be defined as an Arbitrage Accepted Bid or Arbitrage Accepted Offer pursuant to the relevant provision, but instead the fraction δ of each threshold Bid QAB^{nr}_{ij} or threshold Offer QAO^{nr}_{ij} which satisfies the following shall be defined as a Arbitrage Accepted Bid or (as the case may be) Arbitrage Accepted Offer:

$$\delta * \Sigma^{nr} QAB^{nr}_{ij} = \Sigma^{nr'} QAB^{nr'}_{ij}$$

or (as the case may be)

$$\delta * \Sigma^{nr} QAO^{nr}_{ij} = \Sigma^{nr'} QAO^{nr'}_{ij}$$

where

Σ^{nr} is the sum over all threshold Bids or (as the case may be) threshold Offers, and

$\Sigma^{nr'}$ is the sum over all threshold Bids or (as the case may be) threshold Offers (including a fraction γ or φ) which, on the basis of the initial calculation would have been defined as Arbitrage Accepted Bids or Arbitrage Accepted Offers.

– New paragraphs are required (in Section T of the Code) to support the amendments to BSAD utilisation and associated amendment to reporting requirements (in order to verify Settlement Calculations), as follows:

- New clause at T 4.4.2D – In respect of Settlement Period, the Total Forward Purchase Volume (i.e. the total volume of BSAD Forward Purchases) is:

  $TBV_j = \Sigma^t BV_j$

  where Σ^t represents the sum over all Transmission Company Forward Purchases.

- New clause at T 4.4.2E – In respect of Settlement Period, the Total Forward Sale Volume (i.e. the total volume of BSAD Forward Sales) is:

  $TSV_j = \Sigma^t SV_j$

where $\sum^t$ represents the sum over all Transmission Company Forward Sales.

- New clause at T 4.4.7A – In respect of each Settlement Period, the Total Untagged Forward Purchase Volume (i.e. the volume of BSAD Forward Purchases that are not Trade Tagged, and are therefore going forward to set the Energy Imbalance Price) is:

  $TUBV_j = \sum^t BV_j$

  where $\sum^t$ represents the sum over all Transmission Company Forward Purchases that are not Trade Tagged Forward Purchases.

- New clause at T 4.4.8A – In respect of each Settlement Period, the Total Untagged Forward Sale Volume (i.e. the volume of BSAD Forward Sales that are not Trade Tagged, and are therefore going forward to set the Energy Imbalance Price) is:

  $TUSV_j = \sum^t SV_j$

  where $\sum^t$ represents the sum over all Transmission Company Forward Sales that are not Trade Tagged Forward Sales.

– In respect of each Settlement Period, the Total Trade Tagged Volume (T 4.4.10) will be determined as follows:

$TCQ_j = (\sum_i \sum^{n'} QAB^{n'}_{ij} + (TSV_j - TUSV_j)) - (\sum_i \sum^{n*} QAPO^{n*}_{ij} + (TBV_j - TUBV_j))/2$

where $\sum_i$ represents the sum over all BM Units and $\sum^{n'}$ represents the sum over those accepted Bids that are Trade Tagged Bids and $\sum^{n*}$ represents the sum over those accepted Offers that are Trade Tagged Offers.

– A new variable to report the Remaining Imbalance Volume is required. In respect of each Settlement Period, the Remaining Imbalance Volume is determined as follows:

Where $TQAO_j + TBV_j > (-TQAB_j) + (-TSV_j)$ then the Remaining Imbalance Volume (RIV_j) is:

$RIV_j = TUQAO_j + TUBV_j$

Where $TQAO_j + TBV_j < (-TQAB_j) + (-TSV_j)$ then the Remaining Imbalance Volume (RIV_j) is:

$RIV_j = TUQAB_j + TUSV_j$

– The Trade Tagging process is required to be amended to include the stacked individual BSAD trades in the tagging process. This will require the following amendments to Section T, Annex T-1, 3 'Trade Tagging':

3.1 In respect of each Settlement Period, Trade Tagged Offers, Trade Tagged Forward Purchases, Trade Tagged Bids and Trade Tagged Forward Sales will be defined in the following way.

(a) If:

$\sum^{n'}(- QAB^{n'}_{ij}) + \sum^t(-SV_j) \leq BRL_j$

where $\sum^{n'}$ is the sum over those accepted Bids that are both Non-De Minimis Bids and Non-arbitrage Bids and where $\sum^t$ is the sum over all Transmission Company Forward Sales; or

$\sum^{n*} QAO^{n*}_{ij} + \sum^t BV_j \leq BRL_j$

where $\sum^{n*}$ is the sum over those accepted Offers that are both Non-De Minimis Offers and Non-arbitrage Offers and where $\sum^{t}$ is the sum over all Transmission Company Forward Purchases

then no Bids or Offers will be Trade Tagged.

(b) Otherwise, the following procedure will be carried out. The set of all accepted Bids, which are neither De Minimis Bids nor Arbitrage Bids, will be ranked in price order, cheapest first. In any case where such Bids have the same price as each other, the ordering of such Bids will be random, subject to paragraph (g). The set of Non-De Minimis and Non-arbitrage Bids $\{QAB^{n1}_{ij}, QAB^{n2}_{ij}, \ldots QAB^{nw}_{ij}\}$ is then a set of "**Ranked Bids**".

For the set of all Transmission Company Forward Sales, each will be included in the set of Ranked Bids, in price order, and, for the purposes of Trade Tagging only, each Forward Sale will be assigned an n' value and the n' values of the Ranked Bids will be adjusted accordingly[2]. The set of Ranked Bids, including the (individual) Forward Sales (SV_j) will then be a set of "**Ranked Bid Volumes**", as follows:

$(-QAB^{n'}_{ij} \ldots), (-SV^{n'}_{j} \ldots)$

The set of all accepted Offers, which are neither De Minimis Offers nor Arbitrage Offers will be ranked in price order, most expensive first. In any case where such Offers have the same price as each other, the ordering of such Offers will be random, subject to paragraph (g). The set of Non-De Minimis and Non-arbitrage Offers $\{QAO^{n1}_{ij}, QAO^{n2}_{ij}, \ldots QAO^{nx}_{ij}\}$ is then a set of "**Ranked Offers**".

For the set of all Transmission Company Forward Purchases, each will be included in the set of Ranked Offers, in price order, and, for the purposes of Trade Tagging only, each Forward Purchase will be assigned an n* value and the n* values of the Ranked Offers will be adjusted accordingly[3]. The set of Ranked Offers, including the (individual) Forward Sales (BV_j) will then be a set of "**Ranked Offer Volumes**", as follows:

$(QAO^{n*}_{ij} \ldots), (BV^{n*}_{j} \ldots)$

(c) If:

$\sum^{n'}((-QAB^{n'}_{ij}) + (-SV^{n'}_{j})) \leq \sum^{n*}(QAO^{n*}_{ij} + BV^{n*}_{j})$

where $\sum^{n'}$ is the sum over all Ranked Bid Volumes and $\sum^{n*}$ is the sum over all Ranked Offer Volumes.

then for the smallest value of q such that

$\sum^{n'v>q}((-QAB^{n'v}_{ij}) + (-SV^{n'v}_{j})) \leq BRL_j$

where $\sum^{n'v>q}$ is the sum over those Ranked Bid Volumes for which v is greater than q

then, subject to paragraph (g):

(A) for all $q \geq 1$ the Ranked Bid Volumes numbered n'_1 to n'_{q-1} will be defined as Trade Tagged Bids, or Trade Tagged Forward Sales, as the case may be, and

[2] see Figure 4.2 below.
[3] see Figure 4.2 below.

(B) if

$\sum^{n'v>q}((-QAB^{n'v}_{ij}) + (-SV^{n'v}_{j})) = BRL_j$

then the Ranked Bid Volume numbered n'_q will be defined as a Trade Tagged Bid, or Trade Tagged Forward Sale, as the case may be; or if

$\sum^{n'v>q}((-QAB^{n'v}_{ij}) + (-SV^{n'v}_{j})) < BRL_j$

then the fraction γ of $QAB^{n'q}_{ij}$, or $SV^{n'q}_{j}$ as the case may be, which satisfies

$-(\sum^{n'v>q}((QAB^{n'v}_{ij}), (-SV^{n'v}_{j})) + (1 - \gamma) * ((QAB^{n'q}_{ij}), (-SV^{n'q}_{j}))) = BRL_j$

will also be defined as a Trade Tagged Bid, or Trade Tagged Forward Sale, as the case may be.

(d) Since $\sum^{n'}((-QAB^{n'}_{ij}) + (-SV^{n'}_{j})) \leq \sum^{n*}(QAO^{n*}_{ij} + BV^{n*}_{j})$ there must exist a number e and a number φ (which may be a fraction or zero) for which

$-(\sum^{n'v<q}((QAB^{n'v}_{ij}), (-SV^{n'v}_{j})) + \gamma * ((QAB^{n'q}_{ij}), (-SV^{n'q}_{j}))) = \sum^{n*v<e}((QAO^{n*v}_{ij}), (BV^{n*v}_{j})) + \varphi * ((QAO^{n*e}_{ij}), (BV^{n*e}_{j}))$

where $\sum^{n'v<q}$ is the sum over those Ranked Bid Volumes for which v is less than q and $\sum^{n*v<e}$ is the sum over those Ranked Offer Volumes for which v is less than e.

Subject to paragraph (g), the Ranked Offer Volumes numbered 1 to e–1 for which this is true will be defined as Trade Tagged Offers, and Trade Tagged Forward Purchases, as the case may be. If φ is a fraction rather than 0, then the fraction φ of the Ranked Offer Volume numbered e will be defined as a Trade Tagged Offer, or a Trade Tagged Forward Purchase, as the case may be.

(e) If

$\sum^{n'}((-QAB^{n'}_{ij}) + (-SV^{n'}_{j})) > \sum^{n*}(QAO^{n*}_{ij} + BV^{n*}_{j})$

where $\sum^{n'}$ is the sum over all Ranked Bid Volumes and $\sum^{n*}$ is the sum over all Ranked Offer Volumes,

then for the smallest value of q such that

$\sum^{n*v>q}(QAO^{n*v}_{ij}) + (BV^{n*v}_{j}) \leq BRL_j$

where $\sum^{n*v>q}$ is the sum over those Ranked Offer Volumes for which v is greater than q

then, subject to paragraph (g):

(A) for all $q \geq 1$ the Ranked Offer Volumes numbered $n*_1$ to $n*_{q-1}$ will be defined as Trade Tagged Offers, or Trade Tagged Forward Purchases, as the case may be, and

(B) if

$\sum^{n*v>q}(QAO^{n*v}_{ij} + BV^{n*v}_{j}) = BRL_j$

then the Ranked Offer Volume numbered $n*_q$ will be defined as a Trade Tagged Offer, or Trade Tagged Forward Purchase, as the case may be; or if

$\sum^{n*v>q}(QAO^{n*v}_{ij} + BV^{n*v}_{j}) < BRL_j$

then the fraction γ of QAO^{n*q}_{ij}, or BV^{n*q}_{j} as the case may be, which satisfies

$\sum^{n*v>q}(QAO^{n*v}_{ij}), (BV^{n*v}_{j}) + (1 - \gamma) * (QAO^{n*q}_{ij}), (BV^{n*q}_{j}) = BRL_{j}$

will also be defined as a Trade Tagged Offer, or Trade Tagged Forward Purchase, as the case may be.

(f) Since $\sum^{n'}((-QAB^{n'}_{ij}) + (-SV^{n'}_{j})) > \sum^{n*}(QAO^{n*}_{ij} + BV^{n*}_{j})$ there must exist a number e and a number φ (which may be a fraction or zero) for which

$-(\sum^{n'v<e}(QAB^{n'v}_{ij}), (-SV^{n'v}_{j})) + \gamma * ((QAB^{n'e}_{ij}), (-SV^{n'e}_{j}))) = \sum^{n*v<q}((QAO^{n*v}_{ij}), (BV^{n*v}_{j})) + \varphi * ((QAO^{n*q}_{ij}), (BV^{n*q}_{j}))$

where $\sum^{n'v>e}$ is the sum over those Ranked Bid Volumes for which v is less than e and $\sum^{n*v<q}$ is the sum over those Ranked Offer Volumes for which v is less than q.

Subject to paragraph (g), the Ranked Bid Volumes numbered 1 to e–1 for which this is true will be defined as Trade Tagged Bids, and Trade Tagged Forward Sales, as the case may be. If φ is not equal to zero, then the fraction φ of the Ranked Bid Volume numbered e will be defined as a Trade Tagged Bid, or a Trade Tagged Forward Sale, as the case may be.

(g) However, for each of paragraphs (c), (d), (e) and (f) (each a "relevant provision") separately, if the application of the relevant provision (the 'initial calculation') would result in there being any Ranked Bid Volume or Ranked Offer Volume which:

(1) is not a Trade Tagged Bid or Trade Tagged Forward Sale or (as the case may be) Trade Tagged Offer or Trade Tagged Forward Purchase, but

(2) has the same price (other than merely by virtue of being a fraction (1 – γ) or (1 - φ) pursuant to the initial calculation) as a Ranked Bid Volume which is a Trade Tagged Bid or Trade Tagged Forward Sale or (as the case may be) Ranked Offer Volume which is a Trade Tagged Offer or Trade Tagged Forward Purchase,

then:

(i) all such Ranked Bid Volumes $(QAB^{n'r}_{ij})$, $(SV^{n'r}_{j})$ or Ranked Offer Volumes $(QAO^{n'r}_{ij})$, $(BV^{n'r}_{j})$ (whether or not Trade Tagged Bids or Trade Tagged Forward Sales or Trade Tagged Offers or Trade Tagged Forward Purchases on the basis of the initial calculation) which have the same price are "threshold Bid Volumes" or "threshold Offer Volumes";

(ii) no threshold Bid Volume or threshold Offer Volume shall be defined as a Trade Tagged Bid or Trade Tagged Forward Sale, or Trade Tagged Offer or Trade Tagged Forward Purchase pursuant to the relevant provision, but instead the fraction δ of each threshold Bid Volume $(QAB^{n'r}_{ij})$, $(SV^{n'r}_{j})$ or threshold Offer Volume $(QAO^{n'r}_{ij})$, $(BV^{n'r}_{j})$ which satisfies the following shall be defined as a Trade Tagged Bid or Trade Tagged Forward Sale or (as the case may be) Trade Tagged Offer or Trade Tagged Forward Purchase:

$$\delta * \sum^{n'r} (QAB^{n'r}_{ij}), (SV^{n'r}_{j}) = \sum^{n'r'} (QAB^{n'r'}_{ij}), (SV^{n'r'}_{j})$$

or (as the case may be)

$$\delta * \sum^{n'r} (QAO^{n'r}_{ij}), (BV^{n'r}_{j}) = \sum^{n'r'} (QAO^{n'r'}_{ij}), (BV^{n'r'}_{j})$$

where

$\sum^{n'r}$ is the sum over all threshold Bid Volumes or (as the case may be) threshold Offer Volumes, and

$\sum^{n'r'}$ is the sum over all threshold Bid Volumes or (as the case may be) threshold Offer Volumes (including a fraction γ or φ thereof) which, on the basis of the initial calculation would have been defined as Trade Tagged Bids, Trade Tagged Forward Sales, or Trade Tagged Offers or Trade Tagged

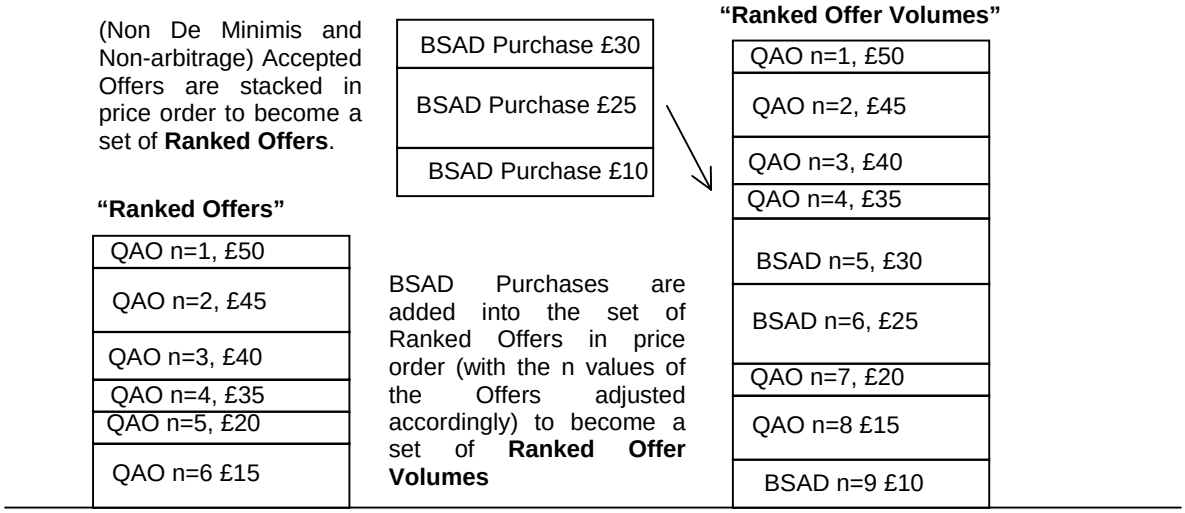


Figure 4.2: Example of Ranking of Offer and Forward Purchase Volumes to form a set of Ranked Offer Volumes.

This completes the requisite amendments to the Settlement Calculations to support Modification P90.

4.3.4 Amendments to Code Definitions to Support Proposed Modification P90

The amendments to the Settlement Calculations require amendments to existing definitions, addition of new definitions and removal of definitions no longer required. The following represents a high level summary of the amendments required:

4.3.4.1 Amendments to Existing Definitions

- **BCA_j** Buy Price Cost Adjustment (£) should be replaced with **BC_j** Forward Purchase Price (£/MWh);
- **BVA_j** Buy Price Volume Adjustment (MWh) should be replaced with **BV_j** Forward Purchase Volume (MWh);
- **SCA_j** Sell Price Cost Adjustment (£) should be replaced with **SC_j** Forward Sale Price (£/MWh);
- **SCA_j** Sell Price Volume Adjustment (MWh) should be replaced with **SV_j** Forward Sale Price (MWh);
- **$TQAPO_j$** Total Accepted Priced Offer Volume should be replaced with **$TUQAO_j$** Total Accepted Untagged Offer Volume; and

- **$TQAPB_j$** Total Accepted Priced Bid Volume should be replaced with **$TUQAB_j$** Total Accepted Untagged Bid Volume.

4.3.4.2 New Definitions

- New superscript '**t**' – Transmission Company Forward Trades;
- **RIV_j** Remaining Imbalance Volume – for each Settlement Period this is the volume of balancing actions on the main stack remaining after Trade Tagging;
- **TBV_j** Total Forward Purchase Volume – for each Settlement Period, this is the total volume of Forward Purchases taken by the Transmission Company;
- **TSV_j** Total Forward Sale Volume – for each Settlement Period, this is the total volume of Forward Sales taken by the Transmission Company;
- **$TUBV_j$** Total Untagged Forward Purchase Volume – for each Settlement Period, this is the total volume of Forward Purchases taken by the Transmission Company, which are untagged after Trade Tagging has been applied;
- **$TUSV_j$** Total Untagged Forward Sale Volume – for each Settlement Period, this is the total volume of Forward Sales taken by the Transmission Company, which are untagged after Trade Tagging has been applied;
- Trade Tagged Forward Purchases – for each Settlement Period these are the BSAD Forward Purchases that have been tagged out by the Trade Tagging process; and
- Trade Tagged Forward Sales – for each Settlement Period these are the BSAD Forward Sales that have been tagged out by the Trade Tagging process.

4.3.4.3 Definitions to be Deleted

- Continuous Acceptance Duration Limit;
- Period Priced Bid Volume;
- Period Priced Offer Volume;
- Period BM Unit Total Priced Accepted Bid Volume;
- Period BM Unit Total Priced Accepted Offer Volume;
- System Total Un-priced Accepted Offer Volume; and
- System Total Un-priced Accepted Bid Volume.

4.3.5 Amendments to the Settlement Report (SAA-I014)

The following details the potential amendments required to the relevant sub-flows of the Settlement Report (SAA-I014 / S0141, S0142 and S0143) as a consequence of the amendments to the Energy Imbalance Price calculation.

The following reporting requirements / amendments have been identified against the Interface Design Definition (IDD) document, in order to provide clarity for the BSC Central Service Provider.

4.3.5.1 Amendments to the Transmission Company subflow (S0142)

The Transmission Company sub-flow of the Settlement Report (S0142) requires amendment as follows:

Group SPI 'Settlement Period Information':

- Amend the report to include a group for reporting each of the individual BSAD trades (expected that the format would be similar to that set out in section 4.3);
- New variables, and therefore new data items, should be included and reported in this group, as follows:
  - Remaining Imbalance Volume (RIV) (MWh);
  - Total Forward Purchase Volume (TBV) (MWh);
  - Total Forward Sale Volume (TSV) (MWh);
  - Total Untagged Forward Purchase Volume (TUBV) (MWh); and
  - Total Untagged Forward Sale Volume (TUSV) (MWh).

Group SSD 'System Period Data':

The same amendments as those listed for the group 'Settlement Period Information' (SPI) would need to be included in the 'System Period Data' group.

4.3.5.2 Amendments to the BSC Party subflow (S0141)

Group SSD 'System Period Data':

The same amendments as those listed for the group 'Settlement Period Information' (SPI) under the Transmission Company sub-flow (S0142) would need to be included in the 'System Period Data' group in this subflow.

4.3.5.3 Amendments to the ELEXON subflow (S0143)

Group SSD 'System Period Data':

The same amendments as those listed for the group 'Settlement Period Information' (SPI) under the Transmission Company sub-flow (S0142) would need to be included in the 'System Period Data' group in this subflow.

4.4 Other Changes Required

This section defines amendments to industry systems, processes and documentation not already identified in the previous sections.

4.4.1 Potential Changes to External Systems

All Parties, the Transmission Company and ELEXON (as they also receive the Transmission Company variant of the Settlement Report) are impacted by the amendments to the Settlement Report, as set out in section 4.3.5.

However, it should be noted that Parties can determine whether they wish to continue receiving the old version of the report (i.e. without the amendments and therefore reducing the ability to accurately verify their trading charges), or the new report, with the amendments. This enables them to

determine the timeframes for implementation of an amended interface independently of its development within the Central Services (unlike a 'big bang' approach). However, the impact from the implementation of amendments to the Settlement Report is still likely to be significant.

4.4.2 Potential Changes to Industry Documentation

The following lists the documentation (other than the documentation specific to the BSC Central Service Agent and therefore 'owned' by the Central Services, such as the URSs) that requires amendment as a result of the implementation of the Modification with a brief summary of the potential change. The documentation listed is believed to represent the full set of impacted documents at this time.

4.4.2.1 The Code

No amendments to the Code, other than those previously defined, are identified at this time.

4.4.2.2 Code Subsidiary Documents - The Reporting Catalogue

The Reporting Catalogue (v2.0) requires amendment to reflect the amendments to the Settlement Report, as detailed in section 4.3.5.

Section 3.1 Interim Information Settlement Report

3.1.1 Report sent to the Transmission Company (TC)

(b) Settlement Period Information …

(h) Settlement Period Information

- System Period Data

The amendments listed in section 4.3.5 should be applied to these sections of the Reporting Catalogue.

3.1.2 Report sent to BSCCo

(c) Settlement Period Information

- System Period Data

The amendments listed in section 4.3.5 should be applied to this section of the Reporting Catalogue.

3.1.3 Reports sent to Parties

(b) Settlement Period Information

- System Period Data

The amendments listed in section 4.3.5 should be applied to this section of the Reporting Catalogue.

No other amendments to the Code Subsidiary Documents, other than those defined above, are identified at this time.

4.4.2.3 Service Description for the Balancing Mechanism Reporting Agent (V4.0)

The following amendments are required to support the implementation of Modification P90:

- The list of BSAD variables at 7.2 requires amendment to reflect the receipt of individual BSAD trades for each Settlement Period (reflecting the amendments defined in section 4.3 of this assessment report);
- Remove clause 8.1 (f), as this relates to CADL;
- Remove clause 8.3, as this relates to CADL (either flag as NOT USED, or remove);
- Clause 10.1 requires amendment to:
  - Remove the ninth bullet, i.e. the reference to Indicative System Total Un-priced Accepted Offer Volume, as this relates to CADL;
  - Remove the tenth bullet, i.e. the reference to Indicative System Total Un-priced Accepted Bid Volume, as this relates to CADL;
  - Remove the eleventh bullet, i.e. the reference to Indicative Total Priced Accepted Offer Volume, as this relates to CADL;
  - Remove the twelfth bullet, i.e. the reference to Indicative Total Priced Accepted Bid Volume, as this relates to CADL; and
  - Add in a new bullet point to reflect the addition and the reporting of Indicative Remaining Imbalance Volume.
- Remove clause 10.13, as this relates to CADL (either flag as NOT USED, or renumber the rest of the section accordingly);
- Remove clause 10.17, as this relates to CADL (either flag as NOT USED, or renumber the rest of the section accordingly);
- Remove clause 10.20, as this relates to CADL (either flag as NOT USED, or renumber the rest of the section accordingly);
- Remove clause 10.21, as this relates to CADL (either flag as NOT USED, or renumber the rest of the section accordingly);

It should be noted that the Service Description for the BMRA, Section 10.19 Calculation of Energy Imbalance Prices, refers to the calculation undertaken by the SAA. Therefore no amendments are required to the BMRA Service Description to reflect the amendment to the Energy Imbalance Price calculation.

4.4.2.4 Service Description for the Settlement Administration Agent (V4.0)

The following amendments are required to support the implementation of Modification P90:

- The list of BSAD variables at 2.1.2 requires amendment to reflect the receipt of individual BSAD trades for each Settlement Period (reflecting the amendments defined in section 4.3.1 of this Assessment Report);
- Remove clause 2.6.4, as this relates to CADL (either flag as NOT USED, or renumber the rest of the section accordingly);
- Remove clause 3.10, as this relates to CADL (either flag as NOT USED, or renumber the rest of the section accordingly);

- Remove clause 3.14, as this relates to CADL (either flag as NOT USED, or renumber the rest of the section accordingly);
- Clause 3.26.1 requires amendment to:
  - Remove the first bullet, as this relates to CADL;
  - Add in a new bullet between bullets 3 and 4 to reflect the addition of individual BSAD trades into the stacks;
  - Remove bullet point 8, as this refers to CADL;
  - Add in a new bullet point between bullet 10 and 11, to reflect the addition of individual BSAD trades into the Bid – Offer stacks prior to Trade Tagging; and
  - Amend the eleventh bullet to reflect that Trade Tagging is applied to Bid – Offer Acceptances and individual BSAD trades.
- Remove clause 3.29, as this relates to CADL (either flag as NOT USED, or renumber the rest of the section accordingly);
- Remove clause 3.30, as this relates to CADL (either flag as NOT USED, or renumber the rest of the section accordingly);
- Section 3.31 of the service description should be amended to reflect the new Energy Imbalance Price calculations, as defined in section 4.3;
- Section 3.32 of the service description should be amended to reflect the new Energy Imbalance Price calculations, as defined in section 4.3;
- Remove clause 3.33, as this relates to CADL (either flag as NOT USED, or renumber the rest of the section accordingly); and
- Remove clause 3.34, as this relates to CADL (either flag as NOT USED, or renumber the rest of the section accordingly).

No other amendments to the Service Descriptions, other than those defined above, are identified at this time.

4.4.2.5 NETA Data File Catalogue

The NETA Data File Catalogue requires amendment to include the new and amended reports, as defined in Section 4.3.5 of this Assessment Report. No other amendments to the NETA Data File Catalogue are identified at this time.

5 ALTERNATIVE MODIFICATION: CONSIDERATION OF OPTIONS

The following options were proposed and considered as a potential Alternative for Proposed Modification P90.

5.1 Option 1: Dynamic Balancing Reserve Level (Real Time)

Option 1 proposes the same mechanism as that described for the Proposed Modification (as set out in section 4), with the following amendments:

- A definition of what constitutes regulating reserve will be derived (for example, those trades taken for warming contracts, standing reserve, regulating reserve and frequency response), such that the Transmission Company can identify ahead of Gate Closure which of their trades for that Settlement Period have been taken for regulating reserve purposes;
- The Transmission Company provide a MWh volume into the BSC Central Service Agent (BMRA and SAA) deemed to have been the amount of regulating reserve required for the Settlement Period (where this changes after the Settlement Period, then the Transmission Company will provide amended values into BMRA and SAA, in the same way as amended BSAD is provided).

  It is expected that the BSAD interface would include (at Settlement Period level) the regulating reserve level to be applied for the Settlement Period.
- BMRA and SAA will utilise the regulating reserve volume so notified as the Balancing Reserve Level for the Settlement Period. This therefore requires that the BRL can be set automatically from the volume notified by the Transmission Company and that it can be varied dynamically between Settlement Periods, and that the value can change retrospectively for a Settlement Period where amendments are identified and notified.
- A default rule is required for this mechanism to cover circumstances where there have been no trades identifiable as regulating reserve, or there is a failure to notify the volume associated with such trades. Therefore it is proposed that a default value of the Authority approved value for BRL be used. Therefore given the current determination that BRL should be set to 5 MWh, this would become the default value for Settlement Periods where the regulating reserve value notified by the Transmission Company is zero, or where there is a failure to notify a value.

This mechanism requires amendment to Section T 1.5 of the Code to reflect the definition of what constitutes regulating reserve, and the service levels and obligations surrounding provision of the BRL dynamically.

This will also require consequential amendments to Transmission Company documentation, systems and processes.

5.2 Option 2: Dynamic Balancing Reserve Level (Average)

Option 2 proposes the same mechanism as that described for the Proposed Modification (as set out in section 4), with the following amendments:

- A definition of what constitutes regulating reserve will be derived (for example, those trades taken for warming contracts, standing reserve, regulating reserve and frequency response), such that the Transmission Company can identify ahead of Gate Closure which of their trades have been taken for regulating reserve purposes. For this mechanism, it is proposed that the Transmission Company base the value for a Settlement Period on an average of the regulating reserve required

over a preceding number of Settlement Days, such that the notified value represents a rolling average of the previously required reserve;

- The Transmission Company provide a MWh volume into the BSC Central Service Agent (BMRA and SAA) deemed to have been the amount of regulating reserve required for the Settlement Period (where this changes after the Settlement Period, then the Transmission Company will provide amended values into BMRA and SAA, in the same way as amended BSAD is provided).

  It is expected that the BSAD interface would include (at Settlement Period level) the regulating reserve level to be applied for the Settlement Period.

- BMRA and SAA will utilise the regulating reserve volume so notified as the Balancing Reserve Level for the Settlement Period. This therefore requires that the BRL can be set automatically from the volume notified by the Transmission Company and that it can be varied dynamically between Settlement Periods, and that the value can change retrospectively for a Settlement Period where amendments are identified and notified.

- A default rule is required for this mechanism to cover circumstances where there have been no trades identifiable as regulating reserve, or there is a failure to notify the volume associated with such trades. Therefore it is proposed that a default value of the Authority approved value for BRL be used. Therefore given the current determination that BRL should be set to 5 MWh, this would become the default value for Settlement Periods where the regulating reserve value notified by the Transmission Company is zero, or where there is a failure to notify a value.

This mechanism requires amendment to Section T 1.5 of the Code to reflect the definition of what constitutes regulating reserve, the time period over which such reserve is calculated, and the service levels and obligations surrounding provision of the BRL for a Settlement Period.

This will also require consequential amendments to Transmission Company documentation, systems and processes.

5.3 Option 3: Reverse Price Set from Main (Larger) Stack

Option 3 proposes the same mechanism as that described for the Proposed Modification (as set out in section 4), with the following amendments:

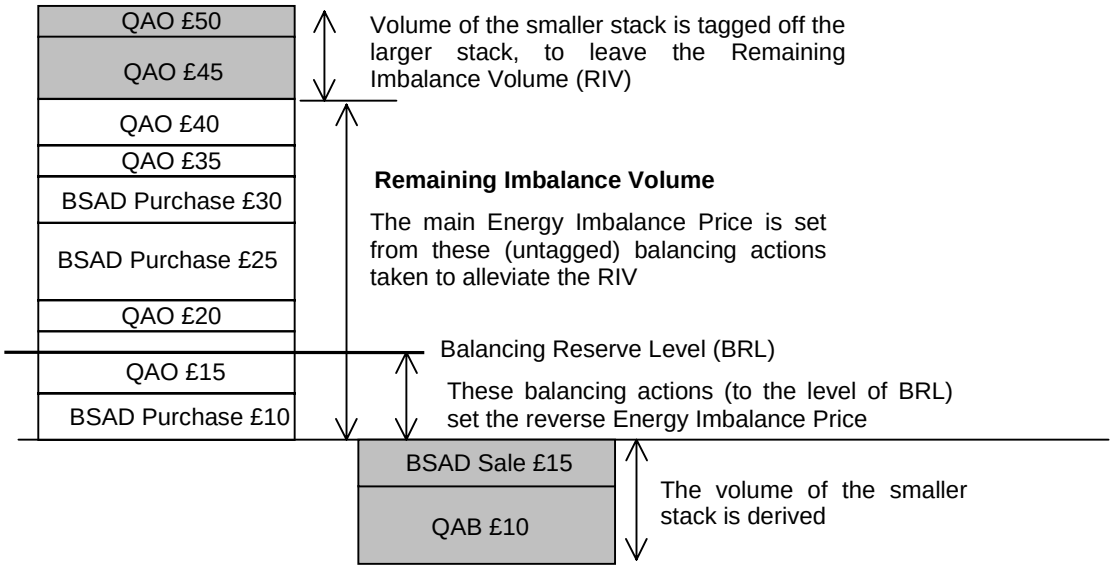
- Bid – Offer Acceptances and Transmission Company forward trades (BSAD) will be stacked as defined for the Proposed Modification P90 (section 4);

- The Remaining Imbalance Volume will be derived by netting the entire volume of the smaller stack from the larger stack.

- The main Energy Imbalance Price will be set from those balancing actions taken to alleviate the Remaining Imbalance Volume;

- The reverse Energy Imbalance Price will be set from balancing actions on the main stack to the level of BRL, see Figure 5.1 below.

ALL (system and energy) Offer Acceptances are stacked in price order (as reflected below) after Arbitrage and De Minimis Tagging is applied (i.e. no CADL'ing is undertaken). Individual (system and energy) BSAD Purchases are slotted into the stack in price order. The volume of the smaller stack is tagged off the larger stack to leave the RIV (setting the main price). Trade Tagging is then applied to the stack to the level of BRL to derive the reverse price.



ALL (system and energy) Bid Acceptances are stacked in price order (as reflected above) after Arbitrage and De Minimis Tagging is applied (i.e. no CADL'ing is undertaken). Individual (system and energy) BSAD Sales are slotted into the stack in price order.

Figure 5.1: Option 3 Proposed Mechanism for Deriving the Energy Imbalance Prices

This mechanism requires further amendments to the Trade Tagging methodology to support the derivation of the reverse price from the main stack.

5.4 Option 4: Reverse Price set from Main and Reverse Stack

Option 4 proposes the same mechanism as that described for the Proposed Modification (as set out in section 4), with the following amendments:

- Bid – Offer Acceptances and Transmission Company forward trades (BSAD) will be stacked as defined in section 4 for Proposed Modification P90;
- The Remaining Imbalance Volume will be derived by netting the entire volume of the smaller stack from the larger stack.
- The main Energy Imbalance Price will be set from those balancing actions taken to alleviate the Remaining Imbalance Volume;
- The reverse Energy Imbalance Price will be set by:
  - Deriving a price from balancing actions on the main stack to the level of BRL;
  - Deriving a price from balancing actions on the reverse stack to the level of BRL; and
  - Averaging them to derive a reverse Energy Imbalance Price.

  Figure 5.2 below provides a high level schematic to illustrate the proposed mechanism.

This mechanism requires further amendments to the Trade Tagging methodology and to the Energy Imbalance Price calculations to support the derivation of the reverse price from an average of balancing actions to BRL on both the main and reverse stack.

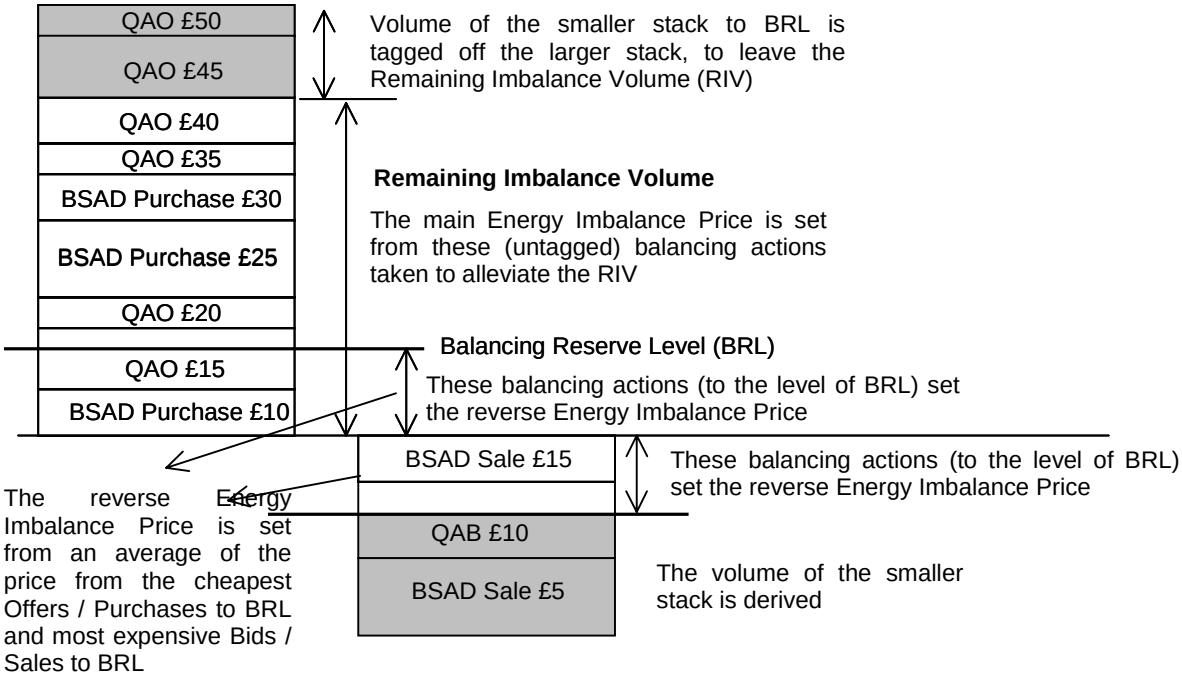


Figure 4.2: Option 4 Proposed Mechanism for Deriving the Energy Imbalance Prices

5.5 Option 5: Reverse Price Set from First Bid – Offer Acceptance on Main Stack

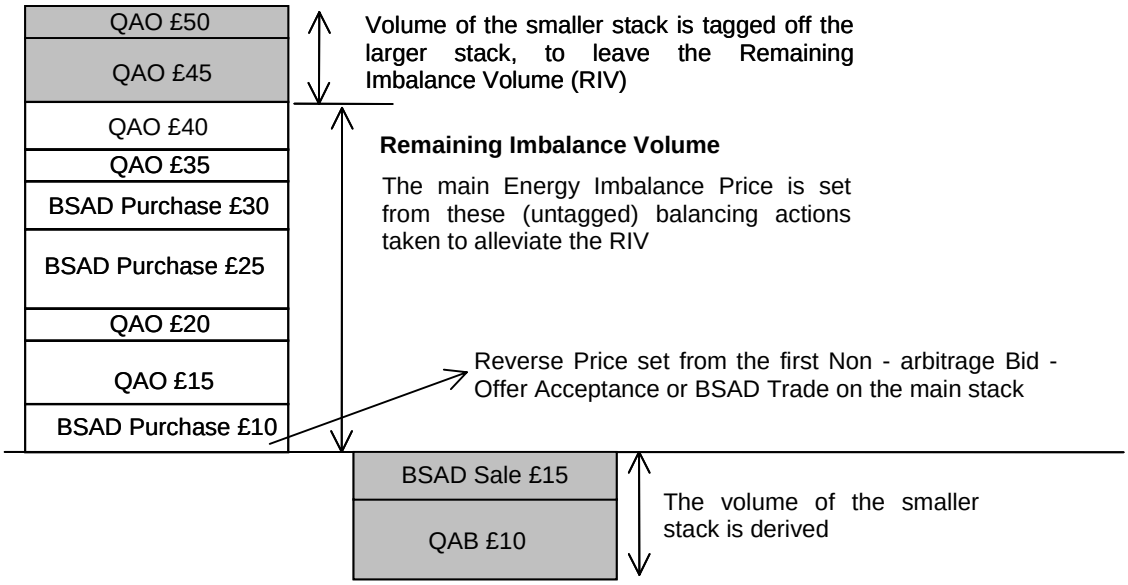
Option 5 proposes the same mechanism as that described for Proposed Modification P90 (as set out in section 4), with the following amendments:

- Bid – Offer Acceptances and Transmission Company forward trades (BSAD) will be stacked as defined for Proposed Modification P90 in section 4;
- The Remaining Imbalance Volume will be derived by netting the entire volume of the smaller stack from the larger stack.
- The main Energy Imbalance Price will be set from those balancing actions taken to alleviate the Remaining Imbalance Volume;
- The reverse Energy Imbalance Price will be set from the first Non-arbitrage Bid – Offer Acceptance or BSAD purchase on the main stack, see Figure 5.3 below.

This mechanism requires further amendments to the Trade Tagging methodology and to the Energy Imbalance Price calculations to support the derivation of the reverse price from a single balancing action on the main stack.

This mechanism also negates the requirement for Balancing Reserve Level, and therefore references to BRL should be removed from the Code.

ALL (system and energy) Offer Acceptances are stacked in price order (as reflected below) after Arbitrage and De Minimis Tagging is applied (i.e. no CADL'ing is undertaken). Individual (system and energy) BSAD Purchases are slotted into the stack in price order. The volume of the smaller stack is tagged off the larger stack to leave the RIV (setting the main price).



ALL (system and energy) Bid Acceptances are stacked in price order (as reflected above) after Arbitrage and De Minimis Tagging is applied (i.e. no CADL'ing is undertaken). Individual (system and energy) BSAD Sales are slotted into the stack in price order.

Figure 4.3: Option 5 Proposed Mechanism for Deriving the Energy Imbalance Prices

5.6 Considerations for the Potential Alternative

The PIMG considered each of the five options to determine whether any of them better achieved the facilitation of the Applicable BSC Objectives than the Proposed Modification, and if so, which one best facilitated achievement of the Applicable BSC Objectives. The PIMG took into consideration the assessment consultation responses (section 15), which were split between a preference for Option 1 (and 2) and Option 5.

The PIMG considered all of the options defined above, and agreed a recommendation that none of these options should be considered as an Alternative to Modification Proposal P90, as the majority of the PIMG believe that the removal of the Continuous Acceptance Duration Limit, common to all of these options for an Alternative, mean that these options have the same issues associated with them as the Proposed Modification, as set out in section 7, but summarised as follows:

- Replacement of the current mechanism for system and energy balancing action differentiation with the mechanism proposed by Proposed Modification P90, potentially will not improve the differentiation between system and energy balancing actions; and
- Energy Imbalance Prices could be polluted by (short duration) system balancing actions resulting from the removal of CADL, with the consequential potential for an increase in the spread and volatility of the Energy Imbalance Prices.

It should be noted that those members of the PIMG that support the Proposed Modification P90 mechanism, and believe that the mechanism provides a less arbitrary mechanism for differentiating between system and energy balancing actions than the current baseline, also did not support any of the options for an Alternative, on the basis that they believe none of them better facilitate achievement of the Applicable BSC Objectives than the Proposed Modification.

The PIMG considered a possible option of the mechanism proposed by Proposed Modification P90 including CADL, but disregarded this on the grounds that the outcome would be a pricing methodology similar to the current baseline, but incorporating disaggregated Transmission Company forward trades. Therefore a number of the PIMG believed that any benefits of this approach would be outweighed by the cost of delivery and the increased complexity in defining system and energy balancing actions when compared to the mechanism proposed by Proposed Modification P90.

The PIMG considered a sixth option, 'Option 6' which can be summarised as the mechanism proposed by Option 5, but including the Continuous Acceptance Duration Level (CADL). The majority of the PIMG preferred this Option over the other potential options and believe, on initial consideration, that Option 6 has the potential to better facilitates achievement of the Applicable BSC Objectives than the Proposed Modification.

It should be noted that a number of PIMG members do not support Option 6. Some believe that Option 6 is not better than Proposed Modification P90, on the grounds that it loses the simplicity and consistency of treatment of balancing actions, which is the main intent of the Proposed Modification. Other members of the PIMG do not support Option 6, as they believe it to be as arbitrary as the Proposed Modification.

The PIMG noted that there was no time to undertake any real assessment of Option 6, as a consequence of it being identified at the PIMG meeting of 3 September 2002 (with the Assessment Report due to be submitted to the Panel meeting of 12 September 2002). On this basis, the PIMG identified three potential ways forward:

1. Request an extension of one month, to enable further assessment of the potential Alternative to Proposed Modification P90 (noting that there are other considerations which require further assessment);

2. Recommend that the Proposed Modification should not be made, and recommend 'Option 6' as the Alternative to Modification Proposal P90; and

3. Recommend that the Proposed Modification should not be made, do not propose an Alternative and provide the issues raised by Modification Proposal P90 to the Pricing Issues Standing Group for consideration.

The PIMG considered these options. The majority of the PIMG believe that Option 6 has some merit as an Alternative, and should therefore be further assessed. Therefore the PIMG agreed that a one month extension to the Assessment Procedure should be requested to enable assessment and analysis in respect of Option 6, as defined in Section F 2.6 of the Code.

However, the PIMG noted that the Panel may not be minded to grant such an extension. Therefore if the requested extension is not granted, and the opportunity for further assessment is not available, the majority of the PIMG agreed that the preferred way forward would be to recommend Option 6 as an Alternative, believing that, on initial consideration that it has sufficient merit. Therefore the PIMG agreed their (provisional) recommendations with regards to Proposed Modification P90 and its Alternative, noting that the assessment of the Alternative could be deemed to be incomplete under the requirements of Section F 2.6 of the Code.

6 ALTERNATIVE MODIFICATION P90

6.1 Alternative Modification Overview

Alternative Modification P90 can be defined as follows (Figure 5.4 below):

- All forwards energy and system trades undertaken by the Transmission Company are reported individually into the BSC Central Service Agent and then used in the Energy Imbalance Price calculation as if they are Bid – Offer Acceptances for the purposes of Trade Tagging, i.e. stacked and then tagged out where appropriate;
- All **Priced** Bid – Offer Acceptances (after CADL, Arbitrage and De Minimis tagging has been applied) are stacked in price order with individual (system and energy) BSAD trades included in the relevant points in the stack;
- All **Un-priced** (i.e. CADL'ed) Bid – Offer Acceptances are placed in the stack for the purposes of Trade Tagging (and therefore for the purposes of the Remaining Imbalance Volume derivation). For the avoidance of doubt, Un-priced Bid Acceptances will be placed in the Bid / sale stack (as a single volume – using the System Total Un-priced Bid – Offer Acceptance Volume (TQUAB and TQUAO)) as if they are the cheapest (i.e. lowest priced, most negative) Bids, and Un-priced Offer Acceptances will be placed in the Offer / purchase stack as if they are the most expensive (i.e. highest priced) Offer;
- The stacks are then netted off to leave the Remaining Imbalance Volume (i.e. the energy imbalance volume of the overall system). Therefore the entire reverse stack, and an equal and opposite amount of the main stack is deemed to be attributable to system balancing;
- The balancing actions taken to alleviate the Remaining Imbalance Volume are then used to calculate the main Energy Imbalance Price;
- The reverse Energy Imbalance Price is set by the least extreme balancing action on the main stack, i.e. the cheapest Offer / Transmission Company forward purchase, where the Offer stack is the main stack, and the most expensive Bid / Transmission Company forward sale, where the Bid stack is the main stack.
- Where the Remaining Imbalance Volume is zero, or there is no volume on the smaller stack, then Energy Imbalance Pricing default rules are invoked.

For the avoidance of doubt:

- Where the system is long, the Bid (and Transmission Company forward sales) stack will be the main stack, and the main price will be the System Sell Price. The reverse stack will be the Offer (and Transmission Company forward purchase) stack and the reverse price will be the System Buy Price; and
- Where the system is short, the Offer (and Transmission Company forward purchase) stack will be the main stack, and the main price will be the System Buy Price. The reverse stack will be the Bid (and Transmission Company forward sale) stack and the reverse price will be the System Sell Price.

The Balancing Mechanism Reporting Agent (BMRA) will calculate and publish the Indicative Energy Imbalance Prices to the currently defined schedule.

The Energy Imbalance Prices are calculated as defined above by the Settlement Administration Agent (SAA) and then applied to Energy Imbalance Volumes as currently defined.

The majority of the PIMG believe that this option 'Option 6' better facilitates achievement of the Applicable BSC Objectives than Proposed Modification P90, by offering the benefits associated with Proposed Modification P90, namely:

- Removal of non transparent judgements (i.e. Transmission Company differentiation) as to whether a balancing action is taken for system or energy balancing purposes;
- Implementation of consistent treatment of Transmission Company forward trades and Bid – Offer Acceptances;
- Improval of the transparency of the Energy Imbalance Price calculation and composite balancing actions; and
- Simplification of the perceived 'over complexity' of the Energy Imbalance Price calculations.

Whilst retaining the Continuous Acceptance Duration Limit (CADL).

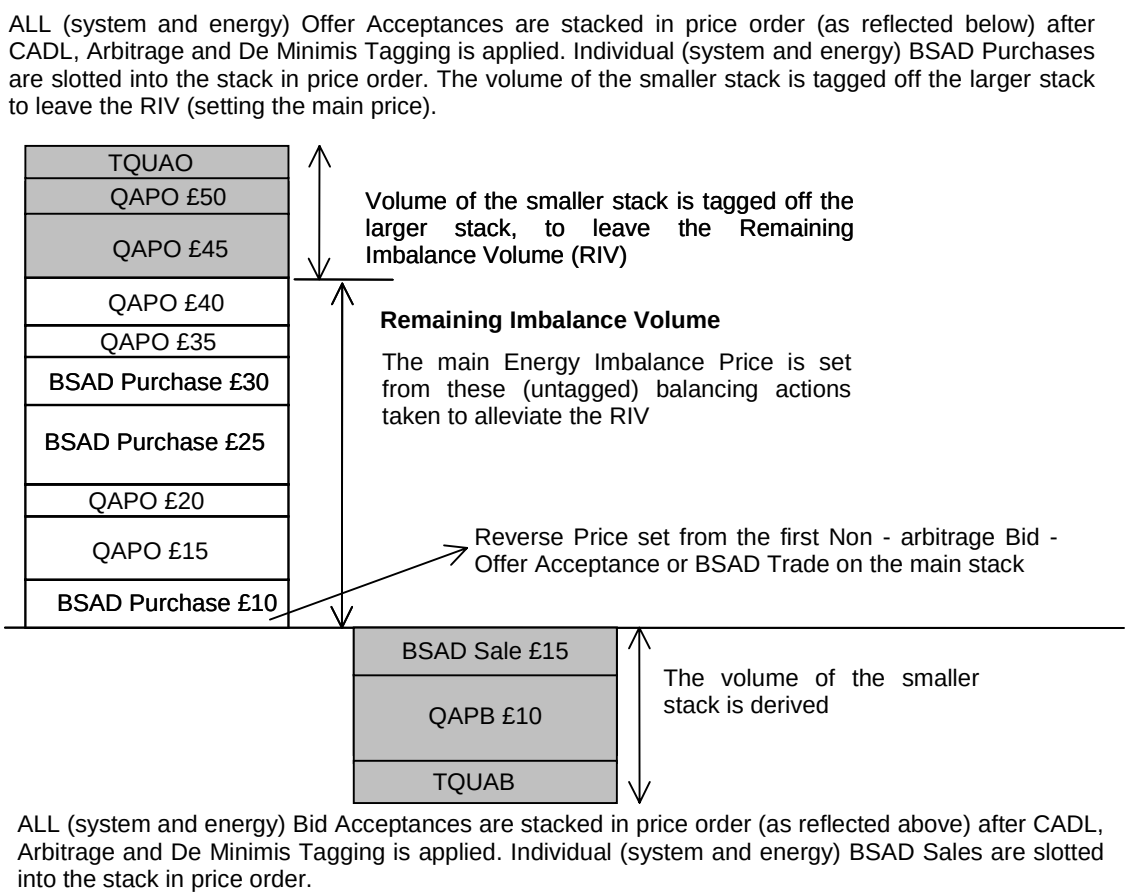


Figure 5.4: Mechanism Proposed by Option 6

7 ASSESSMENT CRITERIA

7.1 Identification of the Relevant Assessment Criteria

During the Assessment Procedure for Modification Proposals P74 and P78 (References 3 and 5), the PIMG considered the issues raised by these Modification Proposals and defined a set of Assessment Criteria, believed to represent the key issues for consideration. This set of Assessment Criteria were considered by the PIMG, and such considerations are reflected in the Assessment Reports for Modification Proposals P74 and P78, (References 3 and 5 respectively).

Due to the similarity of the issues being addressed by Modification Proposal P90 (Proposed and Alternative), the PIMG used the assessment criteria defined for Modification Proposals P74 and P78 as a basis for the definition and consideration of the key issues raised by Modification Proposal P90.

1. Cost-reflectivity: The extent to which system balancing actions are (reasonably) reflected in the Energy Imbalance Prices under Modification Proposal P90;

2. Assessment of the removal of the Continuous Acceptance Duration Limit (CADL) from the Energy Imbalance Price calculation;

   The PIMG addressed both of these points as follows:

   A number of the PIMG believe that Proposed Modification P90 better achieves the differentiation of system and energy balancing actions than the current baseline, as a consequence of the mechanism proposed by P90 removing the requirement for:

   - Arbitrary judgements by the Transmission Company regarding what Transmission Company forward trades are deemed to have been attributable to system balancing and which are deemed to have been for the purposes of energy balancing; and
   - The application of the arbitrary Continuous Acceptance Duration Limit (CADL) to Bid – Offer Acceptances to determine whether they are deemed to be for the purposes of system or energy balancing.

   The above judgements could be considered to represent an arbitrary differentiation based upon the time the balancing action is 'struck', i.e. balancing actions taken prior to Gate Closure are subject to the Transmission Company's judgement as to the purpose of the balancing action, whereas balancing actions taken within the Balancing Mechanism Window are subject to the application of CADL to determine whether the balancing action was deemed to have been for system or energy purposes. This differing treatment could be considered to be arbitrary, as a consequence of timing driving the judgement, leading to inconsistent treatment of balancing actions.

   The mechanism proposed by Modification P90 replaces a set of discrete and arbitrary judgements with a consistent approach applied to all trades (Bid – Offer Acceptances and Transmission Company forward trades), namely stacking all trades and applying Trade Tagging to the level of the Balancing Reserve Limit. This approach applies only one (clear) rule for the differentiation between balancing actions deemed to have been for the purposes of system balancing and energy balancing.

   It could also be argued that including all balancing actions, Bid – Offer Acceptances and forward trades, into the Energy Imbalance Price calculation, prior to the point of Trade Tagging, reflects

the true length of the system and can therefore be considered to be more cost-reflective, as it is explicitly including all costs of balancing.

Conversely, the majority of the PIMG believe that Modification Proposal P90 does not better achieve the differentiation of system and energy balancing actions than the current baseline.

The current baseline uses:

- Judgements by the Transmission Company regarding what Transmission Company forward trades are deemed to have been attributable to system balancing and which are deemed to have been for the purposes of energy balancing; and
- The application of the Continuous Acceptance Duration Limit (CADL) to Bid – Offer Acceptances to determine whether they are deemed to be for the purposes of system or energy balancing.

It could be argued that the Transmission Company assessment as to whether a forward trade was deemed to have been taken for system or energy balancing purposes, should not be considered to be entirely arbitrary, on the grounds that the Transmission Company should be able to determine, generally, the purpose of a forward trade.

It could also be argued that the definition and application of CADL is not entirely arbitrary, on the grounds that the fifteen minute Continuous Acceptance Duration Limit (CADL) was derived from analysis of Bid – Offer Acceptances taken, and can be deemed to be a pragmatic judgement of what balancing actions can be deemed to be attributable to energy balancing and what can be deemed to be attributable to system balancing.

Therefore it could be argued that the mechanism proposed by Proposed Modification P90 is removing two not entirely arbitrary judgements as to the differentiation between system and energy balancing an replacing them with one entirely arbitrary judgement as to the differentiation between energy and system balancing.

Some members of the PIMG noted that the approach proposed by Proposed Modification P90 for the treatment of Transmission Company forward trades is inconsistent, in that it retains the current definition and formulation of the Price Adjusters (the Buy Price Price Adjuster (BPA) and Sell Price Price Adjuster (SPA)). These price adjusters reflect option fees taken by the Transmission Company. The Transmission Company makes an assessment as to whether the option fee was for system or energy balancing purposes, and notifies only those option fees applicable to energy balancing to the BSC Central Service Agent for use in the Energy Imbalance Price calculation. Thus Proposed Modification P90 retains this Transmission Company assessment as to the purpose of the option fee.

However, it was argued by some members of the PIMG that this is a necessary inconsistency, on the basis that option fees are not associated with a volume, and cannot therefore be placed into the stack for Trade Tagging, i.e. system and energy balancing action differentiation.

The majority of the PIMG believe that the removal of the current differentiation between system and energy balancing actions has not been justified by Modification Proposal P90, and that there is no justification as to why the removal of the current differentiation is more cost-reflective, hence development and provisional recommendation of Option 6 as an Alternative to Proposed Modification P90.

3. Noting that Balancing Services Adjustment Data (BSAD) derivation and reporting is beyond the scope of the BSC (and that any changes would be the subject of a separate Transmission Company consultation), consideration of the use of disaggregated BSAD in the Energy Imbalance Price calculation;

   The majority of the PIMG support the use of disaggregated BSAD in the Energy Imbalance Price calculations, on the grounds of improved transparency.

4. The extent to which the reverse price for Modification Proposal P90 can be considered to be cost-reflective of the balancing actions taken to alleviate the energy imbalance, and whether this is material, i.e. if the 'get out of imbalance price' is reflective of the cost of short – term power, this may be considered to be sufficiently cost-reflective;

   The reverse price for Proposed Modification P90 is derived from the application of the Balancing Reserve Limit (BRL) to the smaller balancing action stack (as set out in section 4.1, Figure 4.1). The PIMG indicated that the consideration as to whether this is cost-reflective of energy balancing actions taken, is a function of whether the principle of the Balancing Reserve Level is supported and whether the principle of there being energy balancing actions in the reverse direction to the overall imbalance of the system is supported.

   Therefore it could be argued that if it is believed that the Balancing Reserve Limit under the current baseline is cost-reflective, then it could be argued that, CADL issues aside, Proposed Modification P90 is no more cost-reflective than the current baseline.

   However, the majority of the PIMG believe that if the removal of CADL is taken into consideration, then the reverse stack is potentially open to pollution from system balancing actions that would otherwise have been removed by the CADL mechanism. The potential pollution from such Acceptances could be exacerbated by the situation where there are few Acceptances in the opposite direction to the overall imbalance of the system, a circumstance that occurs relatively frequently under the current arrangements, such that individual Acceptances affect the Energy Imbalance Price disproportionately.

   Conversely, it could be argued that the inclusion of individual Transmission Company forward trades into the Energy Imbalance Price calculation means that such forward trades will mitigate the effect of the removal of CADL, such that balancing actions attributable to system balancing, such as short duration (i.e. CADL'ed) Acceptances would be Trade Tagged out of the stack. However, it could also be argued that balancing actions in the opposite direction to the overall system imbalance are more likely to be taken for system purposes, especially where there are few actions, and the Transmission Company forward trades may be attributable to system balancing.

   The majority of the PIMG agreed that the arguments regarding cost-reflectivity of the main price derived from the mechanism for Modification Proposal also applied to the derivation of the reverse price.

   Following on from the above considerations, the majority of the PIMG believe that using the mechanism proposed by Modification P90, whilst retaining the concept of CADL tagging Acceptances deemed to have been for system balancing purposes derives a more cost-reflective reverse Energy Imbalance Price than the Proposed Modification and the current baseline.

5. The value placed on an action (for example a Bid - Offer Acceptance or spill / top-up in the opposite or same direction to the system imbalance) by the Transmission Company (System

Operator) and the extent to which the Energy Imbalance Prices under Modification Proposal P90 reflect / change this value;

The PIMG did not believe this to be a relevant consideration under Modification Proposal P90 (Proposed or Alternative).

6. The extent to which the costs of (energy) balancing actions are targeted at those paying for the imbalance (noting that balancing actions are taken by the System Operator as a consequence of CVA FPN vs forecast demand, and imbalance is cashed out on a contract vs metered basis);

   The PIMG noted that the targeting of the cost energy balancing actions to those causing the imbalance, is strongly linked to the issue as to whether the Energy Imbalance Prices can be considered to be reflective of the costs of energy balancing. Therefore the PIMG believe that the arguments made under points 1, 2 and 4 are equally applicable to this point.

   Namely that, if the Energy Imbalance Prices resulting from the mechanism proposed by Modification P90 (Proposed or Alternative) can be considered to be more reflective of the cost of energy balancing, i.e. the proposed P90 mechanism provides a better differentiation between system and energy balancing actions than the current baseline, then the costs of energy imbalance are better targeted at those causing the imbalance than the current baseline.

   However, if the Energy Imbalance Prices resulting from the mechanism proposed by Modification P90 (Proposed or Alternative) can be considered to be less reflective of the cost of energy balancing, i.e. the proposed P90 mechanism provides a worse differentiation between system and energy balancing actions than the current baseline, then the costs of energy imbalance are not better targeted at those causing the imbalance than the current baseline.

7. The extent to which the incentive to submit Bid – Offers into the Balancing Mechanism is increased / decreased by the Modification Proposals;

   The PIMG believe that there will be no change to this incentive under either the Proposed or the Alternative.

8. The extent to which Modification Proposal P90 addresses the issues of asymmetric risk, consequential from behaviour in the current arrangements;

   Some members of the PIMG believe that the inclusion of all Transmission Company forward trades into the Energy Imbalance Price calculation may have the effect of reducing the potential spread in the Energy Imbalance Prices by mitigating (higher priced) Bid – Offer Acceptances with (lower priced) Transmission Company forward trade prices. This potential reduction in the Energy Imbalance Price spread, and therefore potentially in volatility, may have the effect of reducing asymmetric risk, and therefore of bringing the market closer to balance. The majority of the PIMG believe this to be the effect of Alternative Modification P90, given that it potentially derives more cost-reflective Energy Imbalance Prices, which are potentially less volatile.

   A converse view, expressed by the majority of the PIMG, is that the Energy Imbalance Prices derived from the P90 mechanism have the potential to be at least as volatile as the current baseline, if not more volatile. This opinion is based upon the data analysis provided (section 8) for the period 2 July to 14 July 2002, and on the potential for the P90 mechanism, via the

removal of the CADL mechanism, to include Bid – Offer Acceptances with a duration of less than CADL in the Energy Imbalance Prices, It should be noted that it is the opinion of a number of members of the PIMG that the analysis undertaken by ELEXON (on behalf of the PIMG) was relatively limited, and has not demonstrated that the removal of the CADL mechanism leads to Bid – Offer Acceptances with a duration of less than CADL being included in the Energy Imbalance Prices. The majority of the PIMG concluded that Modification Proposal P90 would, at best, be neutral to asymmetric risk, but potentially could increase asymmetric risk.

9. The extent to which Parties are incentivised to physically and contractually balance the system as a whole, pre-Gate Closure, (even if individual parties are not) and the consequential effect from any change to the incentive to balance the system;

10. System stability – the extent to which the stability is affected by Modification Proposal P90; and

11. The extent to which the Modification incentivises parties to take a contractual, non-balanced position ahead of Gate Closure;

    Points 9 to 11 can be considered together as related issues.

    The PIMG agreed that the incentive on an individual Party to balance, by contracting ahead of Gate Closure is strongly linked to the perceived risk. The potential for volatility in Energy Imbalance Prices presents a relatively high perceived risk and causes Parties to over contract to avoid exposure to imbalance, particularly the System Buy Price.

    Therefore, the same arguments set out for point 8 also apply here. If Parties perceive lower spreads and reduced volatility in the Energy Imbalance Prices, then the perception is that there is lower risk, and the Party is more likely to try to balance ahead of time. However, if Parties perceive high spreads and increased volatility in the Energy Imbalance Prices, then the perception is that there is increased risk from attempting to balance and the incentive is to over contract to avoid exposure to Energy Imbalance Prices.

12. The extent to which the costs of the System Operator are affected by any increased uncertainty in the physical position of parties;

    The PIMG believe that there will be no increased uncertainty in the physical position of Parties, therefore there will be no direct consequential increase in system operator costs, from either of the Proposed or the Alternative Modification.

13. If the Modification significantly weakens the incentive of participants to balance, would this have an impact on the resultant market price levels compared to competitive market price levels; and

14. The extent to which the Modification Proposal affects the Energy Imbalance Prices, and the consequential affect of this on the prices (and therefore trading) in the traded markets;

    The PIMG believe that the arguments defined under points 8 and 9 are also applicable here, i.e. if perceived risk of exposure to imbalance decreases, then Parties will attempt to balance ahead of Gate Closure, and if the perceived risk of exposure to imbalance increase, then Parties will be

incentivised to over contract and go long. Therefore incentives to balance, or not, as the case may be, have a consequential impact on the prices in the forwards and spot markets.

15. The extent to which incentives to contract ahead of Gate Closure (in the forwards and spot markets) are increased or decreased for the Modification Proposal;

    The PIMG believe that this issue has previously been discussed under previous points.

16. The impact from Modification Proposal P90 on the risk levels of different types of participant, and the consequential effect / impact on competition;

    The PIMG believe that there will be no material change to the risk levels of different types of Parties. However, it was noted that if Energy Imbalance Prices become more volatile under the mechanism proposed by Proposed Modification P90, Parties with unpredictable usage (demand or generation) may be affected disproportionately as a result of the inability to forecast, and the increased risk of exposure to imbalance. Conversely, if Energy Imbalance Prices become less volatile, then these Parties may benfit.

17. The extent to which Modification Proposal P90 affects prompt price reporting and market transparency;

    Noting the issue set out in section 1.5 of this report regarding prompt price reporting of system to system BSAD trades, and assuming that this issue has been resolved at the point of implementation of Modification Proposal P90, then Modification Proposal P90 (Proposed and Alternative) has no impact on prompt price reporting.

    It should be noted that an issue regarding the Grid Trade Master Agreement (GTMA) has been raised by the Transmission Company, in respect of reporting individual forward trades on the BMRA (applicable to both the Proposed and the Alternative Modification). The Transmission Company has standard confidentiality clauses in their GTMA with other Parties, and this effectively means that such forward trades cannot be reported on the BMRA under the confidentiality clause, even though the trades would be anonymous and comprise only volumes and associated prices. Therefore, the Transmission Company's GTMA would require re-negotiation to enable such publication of the forward trades.

    The Transmission Company believe this to be a surmountable issue, but wished for it to be documented to ensure that Parties are aware of this requirement.

    The majority of the PIMG believe that reporting and use of disaggregated BSAD trades improves the transparency of the market.

18. The interactions between Modification Proposal P90 and other related Modification Proposals, specifically Modification Proposals P74, P78 and P79;

    This point is explored further in sections 1.3 and 1.4 of this Assessment Report.

19. The extent to which Modification Proposal P90 better facilitates achievement of the Applicable BSC Objectives than the current baseline; and

20. The extent to which any Alternative Modification Proposal better facilitates achievement of the Applicable BSC Objectives than the Proposed Modification Proposal.

    This pointis explored further in section 9 of this Assessment Report, and is summarised in Section 1.3.

8 ANALYSIS TO SUPPORT THE ASSESSMENT OF MODIFICATION PROPOSAL P90

Graphs 1 to 7 (inclusive) are provided in an attached document: '**MAR090_Section 8**';

The Daily Energy Imbalance Price comparison graphs are provided in attached file: '**MAR090_Daily**';

The Daily Energy Imbalance Price Spread comparison graphs are provided in attached document: '**MAR090_Spread**'; and

The data sheet referenced later in this section is provided in an attached document: '**MAR090_Daily**', in the worksheet entitled 'Data'.

8.1 Analysis Undertaken: Proposed Modification

The methodology for the Proposed Modification P90 could not be modelled using any approximation of the current Settlement Calculations, therefore the methodology had to be replicated using a manual (Access database oriented) approximation. The following steps were undertaken:

- Disaggregated Balancing Services Adjustment Data (BSAD) trades were requested from the Transmission Company. These were provided for the period 2 July 2002 to 14 July 2002, inclusive;
- All Bid – Offer Acceptances for the period 2 July to 14 July inclusive were obtained. These were all Bid – Offer Acceptances, (i.e. prior to the application of the Continuous Acceptance Duration Limit (CADL), De Minimis Tagging and Arbitrage Tagging);
- **CADL WAS NOT APPLIED TO ANY BID – OFFER ACCEPTANCES**. Proposed Modification P90 negates the requirement for CADL to be applied, as it utilises the Trade Tagging mechanism to differentiate between system and energy balancing actions;
- The Bid – Offer Acceptances then had De Minimis Tagging applied (i.e. all acceptances with an acceptance volume of less than 1 MWh were removed);
- **NO ARBITRAGE TAGGING WAS PERFORMED**. Due to the (enforced) manual approach, including Arbitrage Tagging in the approximation proved too complex. It should be noted that an assessment of the impact of not undertaking Arbitrage Tagging was performed and this indicates that the effect of not Arbitrage Tagging is minimal, as the level of Arbitrage tagging for the relevant time period is relatively low;
- The Bid – Offer Acceptances and disaggregated BSAD trades were stacked, in price order, Bids and Sales on one stack, and Offers and purchases on the other. The Remaining Imbalance Volume was determined on the larger stack, and an Energy Imbalance Price derived from those actions. Actions to the 5 MWh Balancing Reserve Limit on the smaller stack set the other Energy Imbalance Price.

The resulting (P90) Energy Imbalance Prices were then compared with those Energy Imbalance Prices derived from the current baseline for the same period (i.e. 2 July to 14 July inclusive). It should be noted that the prices are derived from the current baseline plus a BRL of 5 MWh (as the baseline for 2 July to 14 July was BRL = 180 MWh).

For the avoidance of doubt, the Proposed Modification P90 methodology is the only one that utilises disaggregated BSAD, including system BSAD (not currently reported / utilised), and does not use CADL.

It should be noted that as a consequence of commercial sensitivity regarding the disaggregated BSAD, it is not possible to provide the underlying data analysis.

The following analysis is provided in this section:

- Section 8.1.1 Data Analysis: Provides a high level comparison of the System Buy Prices resulting from the current baseline (noting the application of BRL of 5 MWh) and those derived under Proposed Modification P90, as well as a comparative analysis of the BSAD volumes for this period. This is the set of analysis that was provided with the assessment consultation;
- Section 8.1.2 Daily Analysis: Provides a daily comparison of the Energy Imbalance Prices resulting from the current baseline (noting the application of BRL of 5 MWh) and those derived under Proposed Modification P90; and
- Section 8.1.3 Spread Analysis: Provides a daily (as well as a daily average) comparison of the spread between the Energy Imbalance Prices resulting from the current baseline (noting the application of BRL of 5 MWh) and those derived under Proposed Modification P90.

8.1.1 Data Analysis: Graphs

The comparison of the two System Sell Prices (ie. P90 SSP and current (BRL = 5) SSP) showed differences of pence between the two mechanisms, therefore this analysis is not provided.

A comparison of the System Buy Price derived from each of the mechanisms was then undertaken:

- C15SBP – is the System Buy Price calculated, using the current mechanism with BRL = 5 MWh for the period 2 July to 14 July 2002; and
- P90SBP – is the System Buy Price calculated for the period 2 July to 14 July 2002, using the Proposed Modification P90 mechanism.

Graph 1: System Buy Price Comparison by Daily Average

The System Buy Price for each of the three mechanisms was calculated (as described above) and a daily average calculated for each of the mechanisms.

This initial analysis indicates the effect on the System Buy Price, noted for Modification P90, is materially a consequence of the increase in BSAD volumes, and, in some cases, the effect of these additional volumes on the market length (Graph 2). An illustration of this effect can be seen for 8 July 2002, where an overnight (system) BSAD trade caused a change in reported market length over that derived from the current baseline. The current baseline methodology reports that the market was short for the same period, as a consequence of system BSAD trades not being considered. The aspect of the changing of market length resulting from the methodology utilised, is explored further in Graph 4.

Graph 2: System Buy Price Comparison for 8 July 2002

The 8 July 2002 was chosen for a more in depth representation as a consequence of the effect of Pre Gate Closure BM Unit Transactions (PGBTs), which caused the reported market length to change from that reported under the current methodology (i.e the reported market length under the current baseline is in the opposite direction to that reported for P90, as a consequence of the inclusion of 'system' BSAD (PGBTs in this case) in the P90 methodology).

Graph 3: System Buy Price Comparison for 9 July 2002

The 9 July 2002 was chosen for a more in depth representation, as it reflects the effects of the differing mechanisms applied. The mechanism for Proposed Modification P90 'removes' a set of relatively high System Buy Prices (Settlement Periods 25 to 27), as a consequence of the inclusion of the BSAD in the Trade Tagging mechanism.

Settlement Period 35 reflects the effect of a Pre Gate Closure BM Unit Transaction (PGBT). The only Offer Acceptance / BSAD purchase in Settlement Period 35 on 9 July 2002 was a high value PGBT, which set the System Buy Price.

Graph 4: Number of Times Reported Market Length Changes Between Current Mechanism and Proposed Modification P90

This graph explores further the affect on the reported market length from the inclusion of all (disaggregated, system and energy) BSAD trades in the P90 Energy Imbalance Price mechanism. The graph represents the number of Settlement Periods (represented as a total of changes through the Settlement Day) where the P90 methodology has a different reported market length to that derived under the current baseline.

Graph 5: Comparison of Current (Energy) BSAD and Proposed Modification P90 (System and Energy) BSAD Volumes

This graph explores the effect on the total BSAD volumes from the inclusion of system BSAD trades under the mechanism proposed by Modification P90. The graph compares the BSAD volumes, for the period 2 July 2002 to 14 July 2002 inclusive, for the current baseline, i.e. gross reported energy BSAD, against the total volumes of trades, i.e. both system and energy, for Proposed Modification P90.

Graphs 6 and 7.

The Settlement Day of December 17 2001 was used during the analysis for Modification Proposals P74 and P78 as an arbitrarily chosen, typical representation of a Settlement Day in winter, where the system was under relative stress. On this basis, it seems reasonable to use this Settlement Day to provide a comparative analysis of the Energy Imbalance Prices derived from the current mechanism (with BRL = 5 MWh), with those derived from the mechanism for Proposed Modification P90, for a Settlement Day during a different BSC Season and therefore with a different generation / demand profile to that of the analysis for 2 to 14 July 2002.

A point of note in respect of the 17 December 2001 is that the Transmission Company did not undertake any system forward trades for the Settlement Day. All of the BSAD on 17 December 2001 was deemed to have been attributable to energy balancing, and was therefore reported in BSAD.

An additional point of note is that the Energy Imbalance Prices for a number of Settlement Periods, derived for Proposed Modification P90, are affected by the lack of Arbitrage Tagging (highlighted above). The affect has been calculated and is represented as a (£/MWh) price difference on the P90

Energy Imbalance Price (a minus sign indicates a decrease against the derived Energy Imbalance Price), as follows:

System Buy Price:

Settlement Periods **13** (£-2.02), **15** (£-0.68), **26** (£0.02), **35** (£-20.30), **36** (£-20.30) and **39** (£-6.20).

System Sell Price:

Settlement Periods **15** (£9.53), **36** (£0.02) and **39** (£-6.20).

Graph 6: System Buy Price Comparison for 17 December 2001

Graph 7: System Sell Price Comparison for 17 December 2001

8.1.2 Daily Analysis

Two graphs are provided for each Settlement Day in the period 2 July to 14 July 2002 inclusive, one graph for comparison of the System Buy Prices and one for comparison of the System Sell Prices.

In order to verify the reason for the differences between the Energy Imbalance Prices resulting from the current baseline, and those resulting from Modification P90, Energy Imbalance Prices were also derived for the current mechanism, but with the Continuous Acceptance Duration Limit (CADL) set to zero (i.e. 'switched off' – no Bid – Offer Acceptances were CADL'ed). Comparison of the CADL = 0 prices with those derived from the CADL = 15 minutes (current baseline) enables a judgement to be made as to whether the difference in the CADL = 15 Energy Imbalance Price and the P90 Energy Imbalance Price is due to the effects of CADL (i.e. if CADL 15 = CADL 0, then the effects of CADL are immaterial for that Settlement Period).

Where there is little or not difference between CADL 15 and CADL 0, then the difference between the current baseline (CADL 15) and the Modification P90 mechanism must be due to the incorporation of all individual Transmission Company forward trades into the Energy Imbalance Price calculation.

A data sheet is provided in support of this analysis (document: 'MAR090_Data') which provides the C15 (current baseline), P90 (Modification P90 mechanism) and C00 (current baseline, CADL 0) derived Energy Imbalance Prices so that comparative analysis of the different mechanisms is possible.

In relation to the period 2 July to 14 July 2002, it can be seen that generally, the difference between the Energy Imbalance Prices resulting from the current mechanism and those derived from the Proposed Modification P90 mechanism are attributable to the incorporation of all individual Transmission Company forward trades into the Energy Imbalance Price calculation.

It should be noted that the data sheet provided (document: 'MAR090_Daily') also contains the following additional data (on the worksheet entitled 'Data') for information:

- The Settlement Periods where the market was short under the Modification P90 mechanism (this enables identification of whether the main price was the System Buy price of the System Sell Price. For the avoidance of doubt, where the market is long, then the main price is the System Sell Price, and where the system is short, then the main price is the System Buy Price);
- The Settlement Periods where the reported market length differs between the current baseline and the Modification P90 mechanism (as a consequence of the inclusion of additional (system) Transmission Company forward trades under the P90 mechanism), including what the reported

market length was under the current baseline and what is went to under the P90 Modification mechanism; and

- The spread between the Energy Imbalance Prices for each of the mechanisms (see section 8.1.3).

8.1.3 Spread Analysis

One graph is provided for each Settlement Day in the period 2 July to 14 July 2002 inclusive, providing a comparison of the spread between the Energy Imbalance Prices (i.e. SBP – SSP) for each of the mechanisms, current baseline and Modification P90.

An additional graph is provided which provides a daily average comparison of the spreads for the same period.

9 APPLICABLE BSC OBJECTIVES

The Applicable BSC Objectives are set out in paragraph 3 of Condition C3 of the Transmission Licence, as follows:

(a) The efficient discharge by the Transmission Company of the obligations imposed under the Transmission Licence;

(b) The efficient, economic and co-ordinated operation by the Transmission Company of the 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) Promoting efficiency in the implementation and administration of the balancing and settlement arrangements.

The PIMG, having reached a conclusion on each of the Assessment Criteria (see section 7), considered how the conclusions on the impacts and incentives of the Proposed and the Alternative Modification would lead to the Proposed and the Alternative Modification better facilitating achievement of each of the Applicable BSC Objectives, and the extent to which this is the case.

9.1 Proposed Modification P90

The PIMG considered the conclusion reached on each of the Assessment Criteria (section 7). On balance, despite improvements in transparency, the majority of the PIMG do not believe that Proposed Modification P90 better facilitates achievement of the Applicable BSC Objectives.

It should be noted that the conclusions of the majority of the PIMG differ to those reached by the majority of Parties in their assessment consultation responses. However, the PIMG, in reaching their conclusions, have been required to have due regard to the rationale provided by Parties in their consultation responses.

The PIMG have also taken into consideration the potential costs of development and implementation provided in the BSC Central Service Agent Detailed Level Impact Assessment.

It should also be noted that the majority of the reasons provided to support the assertion that Proposed Modification P90 does not better facilitate the Applicable BSC Objectives, are based on the assertion that Proposed Modification P90 does not create a better differentiation between system and energy balancing actions, and that therefore the resulting Energy Imbalance Prices are consequently not as cost-reflective of energy balancing actions as the current mechanism.

Conversely, if it is believed that Proposed Modification P90 creates a better differentiation between system and energy balancing actions, and that therefore the resulting Energy Imbalance Prices are more cost-reflective of energy balancing actions than the current mechanism, then these reasons for not facilitating achievement of the Applicable BSC Objectives can be turned round to indicate that the Proposed Modification does better facilitate the Applicable BSC Objectives.

However, as the majority of the PIMG do not believe that the mechanism proposed by Proposed Modification P90 gives more cost-reflective Energy Imbalance Prices (section 7, point (1)), then the reasons for it not facilitating the Applicable BSC Objectives are as follows:

9.1.1 Objective 3(a)

The PIMG believe that the Proposed Modification is neutral to this objective.

9.1.2 Objective 3(b)

The majority of the PIMG believe that the Proposed Modification does not, on balance, better facilitate achievement of the Applicable Objective pertaining to the economic and efficient operation of the Transmission Network as follows:

- The reporting of disaggregated Transmission Company forward trades may have the effect of improving transparency for BSC Parties, which may also have the affect of enabling Parties to offer services to (and therefore forward trade with) the Transmission Company, more efficiently, this improving the ability of the Transmission Company (system operator) to balance the market more efficiently and effectively;
- However, given the potential volatility in the Energy Imbalance Prices resulting from the removal of the Continuous Acceptance Duration Limit, the market is unlikely to come closer to balance, as the incentive is to over contract to reduce the risk of exposure to imbalance, therefore this may reduce the ability of the Transmission Company (system operator) to balance the market more efficiently and effectively;
- Following on from the above point, the potential for the reduced incentive on Parties to balance their positions ahead of Gate Closure, resulting from the incentive to over contract to protect from the risk of exposure to imbalance, may reduce the ability of the Transmission Company (system operator) to make informed decisions about balancing the system, thus reducing efficiency and economic operation; and
- Any potential reduction in the cost-reflectivity of Energy Imbalance Prices may have the effect of reducing the accuracy of signals to the Transmission Company (system operator) and BSC Parties of the costs of balancing the system, thus potentially failing to promote the efficient, economic and co-ordinated operation of the Transmission System.

9.1.3 Objective 3(c)

The majority of the PIMG believe that the Proposed Modification does not, on balance. better facilitate achievement of the Applicable BSC Objective pertaining to the promotion of effective competition in the sale and purchase of electricity, for the following reasons:

- As the Proposed Modification has the potential to increase the spread of the Energy Imbalance Prices , the risks of exposure to imbalance are at least equal to, and potentially higher than, the current baseline, thus potentially reducing competition in the sale and purchase of electricity;

- Any reduction in the cost-reflectivity of Energy Imbalance Prices means that there is the potential for the costs of energy balancing to be less correctly targeted at those causing the imbalance, thus potentially reducing competition by creating cross subsidies;
- The implementation of a potentially less cost-reflective cash-out regime may reduce the incentives on parties to balance their positions ahead of Gate Closure, which may have the affect of increasing the number of actions the Transmission Company (system operator) has to take to correct the imbalance of the system. Thus this potentially increases the role of centrally administered mechanisms and does not facilitate the bilateral trading of energy; and
- Any increase in the risk of exposure to imbalance potentially decreases the incentive to balance, and therefore reduces bilateral trading ahead of Gate Closure. This potentially has the effect of discouraging Parties from trading closer to real time, thus reducing liquidity in the forwards and spot markets and reducing competition.

9.1.4 Objective 3(d)

The majority of the PIMG believe that the Proposed Modification does not, on balance, better facilitate achievement of the Applicable BSC Objective pertaining to the promotion of efficiency in the implementation and administration of the balancing and settlement arrangements, for the following reasons:

- The Proposed Modification P90 introduces a level of simplicity into the Settlement calculations that may have the effect of improving efficiency in the implementation and administration of the balancing and settlement arrangements; and
- The Proposed Modification increases the administration costs of the balancing and settlement arrangements, and this may outweighs any benefits of implementation of the Proposed Modification.

9.2 Alternative Modification P90

The PIMG considered the conclusion reached on each of the Assessment Criteria (section 7). On balance, the majority of the PIMG believe that Alternative Modification P90 better facilitates achievement of the Applicable BSC Objectives.

It should be noted that the majority of the reasons provided to support the assertion that Alternative Modification P90 better facilitates the Applicable BSC Objectives, are based on the assertion that Alternative Modification P90 better differentiates between system and energy balancing actions than the current mechanism, and that therefore the resulting Energy Imbalance Prices are more cost-reflective of energy balancing actions than the current mechanism.

Conversely, if it is believed that Alternative Modification P90 creates a worse differentiation between system and energy balancing actions, and that therefore the resulting Energy Imbalance Prices are less cost-reflective of energy balancing actions than the current mechanism, then these reasons for better facilitating achievement of the Applicable BSC Objectives can be turned round to indicate that the Alternative Modification does not better facilitate the Applicable BSC Objectives.

However, as the majority of the PIMG believe that the mechanism proposed by Alternative Modification P90 gives more cost-reflective Energy Imbalance Prices (section 7, point (1)), then the reasons for it better facilitating the Applicable BSC Objectives are as follows:

9.2.1 Objective 3(a)

The PIMG believe that the Alternative Modification is neutral to this objective.

9.2.2 Objective 3(b)

The majority of the PIMG believe that the Alternative Modification better facilitates achievement of the Applicable Objective pertaining to the economic and efficient operation of the Transmission Network as follows:

- A proposed outcome of both the Alternative Modification is that the market will come closer to balance, as a consequence of the potential reduction in the risk to exposure to imbalance. On this basis, the Transmission Company (system operator) should be able to balance the market more efficiently and effectively;
- The increased incentive for parties to balance their individual positions ahead of Gate Closure, resulting from the potential reduction in the risk of exposure to imbalance, should result in increased accuracy of information provided to the Transmission Company (system operator) ahead of Gate Closure, thus enabling it to make informed decisions about balancing the system, improving efficiency and economic operation; and
- Improving the cost-reflectivity of the Energy Imbalance Prices should promote the efficient, economic and co-ordinated operation of the Transmission Network by providing more accurate signals to the system operator (and BSC Parties) of the costs of balancing the system.

9.2.3 Objective 3(c)

The majority of the PIMG believe that Alternative Modification P90 better facilitates achievement of the Applicable BSC Objective pertaining to the promotion of effective competition in the sale and purchase of electricity, for the following reasons:

- A proposed outcome of Alternative Modification P90 is that the buy – sell spread of the Energy Imbalance Prices will potentially be reduced, thus reducing the risks of exposure to imbalance, thus improving competition in the sale and purchase of electricity;
- Improving the cost-reflectivity of the Energy Imbalance Prices means that the cost of energy balancing is more correctly targeted at those causing the imbalance, and therefore this improves competition by preventing cross-subsidies;
- The implementation of a more cost-reflective dual cash-out price regime incentivises participants to balance their individual positions ahead of Gate Closure, therefore minimising the actions that the system operator has to take to correct the system energy imbalance. Thus, this assists in minimising the role of centrally administered mechanisms and facilitates the bilateral trading of energy; and
- Reduction in the risk of exposure to imbalance, whilst maintaining the incentives to balance, and therefore trade bilaterally, ahead of Gate Closure, may have the effect of encouraging participants to trade closer to real-time, with the associated effect of improving liquidity in the forwards and spot markets, thus increasing competition.

9.2.4 Objective 3(d)

The majority of the PIMG believe that the Alternative Modification does, on balance,. better facilitate achievement of the Applicable BSC Objective pertaining to the promotion of efficiency in the

implementation and administration of the balancing and settlement arrangements, for the following reasons:

- Alternative Modification P90 introduces a level of simplicity into the Settlement calculations that may have the effect of improving efficiency in the implementation and administration of the balancing and settlement arrangements; and
- Alternative Modification P90 increases the administration costs of the balancing and settlement arrangements, but this may be outweighed by the benefits of implementation of the Alternative Modification.

10 IMPACT ON BSC SYSTEMS

The Detailed Level Impact Assessment is provided in ANNEX 3 of this Assessment Report.

10.1 Options for Alternative: Impact Assessments

The BSC Central Service Agent was provided with a definition of Proposed Modification P90 and the five options for a potential Alternative Modification, as set out in section 4 of this Assessment Report.

The costs and timescales for each of the options is as follows:

10.1.1 Option 1: Dynamic BRL (Real Time)

Development and implementation of all changes to support Option 1:

- Development and Implementation costs: **£774,500**
- Ongoing Operate and Maintain costs: **£9,036 per month**
- Development Timescales: **25 weeks**

10.1.2 Option 2: Dynamic BRL (Average)

Development and implementation of all changes to support Option 2:

- Development and Implementation costs: **£774,500**
- Ongoing Operate and Maintain costs: **£9,036 per month**
- Development Timescales: **25 weeks**

10.1.3 Option 3: Reverse Price set from Main (Larger) Stack

Development and implementation of all changes to support Option 3:

- Development and Implementation costs: **£785,500**
- Ongoing Operate and Maintain costs: **£9,164 per month**
- Development Timescales: **25 weeks**

10.1.4 Option 4: Reverse Price set from Main and Reverse Stack

Development and implementation of all changes to support Option 4:

- Development and Implementation costs: **£785,500**

- Ongoing Operate and Maintain costs: **£9,164 per month**
- Development Timescales: **25 weeks**

10.1.5 Option 5: Reverse Price set from First Bid – Offer Acceptance on the Main Stack

Development and implementation of all changes to support Option 5:

- Development and Implementation costs: **£755,400**
- Ongoing Operate and Maintain costs: **£8,813 per month**
- Development Timescales: **24 weeks**

10.2 Proposed Modification

Development and implementation of all changes to support the Proposed Modification:

- Development and Implementation costs: **£755,400**
- Ongoing Operate and Maintain costs: **£8,813 per month**
- Development Timescales: **24 weeks**

10.3 Alternative Modification

It should be noted that the Alternative Modification has not been assessed by the BSC Central Service Agent at this time, and the following development and implementation costs and timescales are based on the Detailed Level Impact Assessment previously notified for the other options associated with the Proposed Modification, and its options for Alternatives.

Development and implementation of all changes to support the Alternative Modification:

- Development and Implementation costs: **£755,400**
- Ongoing Operate and Maintain costs: **£8,813 per month**
- Development Timescales: **24 weeks**

11 IMPACT ON CORE INDUSTRY DOCUMENTS AND SUPPORTING ARRANGEMENTS

11.1 Supplemental Agreements: BSAD Methodology Statement

Currently Balancing Services Adjustment Data (BSAD) comprises forward trades taken by the Transmission Company deemed to have been attributable to energy balancing. The Transmission Company provides a gross sale volume, price, and price adjuster and a gross purchase volume, price and price adjuster into the BSC Central Service Agent for reporting on the BMRA and for use in the Energy Imbalance Price calculation.

The Balancing Services Adjustment Data Methodology Statement (owned by the Transmission Company) sets out the formulation, derivation and reporting aspects associated with BSAD.

Proposed Modification P90 requires that the formulation, derivation and reporting of BSAD be amended to require that all Transmission Company forward trades, i.e. taken for the purposes of system and energy balancing, be reported, as individual forward trades (i.e. disaggregated BSAD) for reporting on BMRA and for use in the Energy Imbalance Price calculation. This requires amendment to the Balancing Services Adjustment Data Methodology Statement to give effect to this change.

Changes to the Balancing Services Adjustment Data Methodology Statement are outside of the scope of this Modification Proposal and Assessment Report, and are subject to the Transmission Company's process for amendment. The amendments to BSAD contained within this Assessment Report are for the purposes of providing an example for assessment of Proposed Modification P90.

It should be noted that any (agreed) amendments to BSAD may require consequential amendment to the BSAD reporting and utilisation set out in this Assessment Report and subsequent amendment to any legal drafting provided with this Modification Proposal. It should also be noted that, dependent upon the timing of any consultation on BSAD changes, an additional Modification Proposal may have to be raised to effect the amendments to BSAD required to support Modification Proposal P90.

11.2 Settlement Agreement for Scotland (SAS)

The Scottish Administered Wholesale Pricing Arrangements, namely the Scottish trading arrangements for dealing with imbalance volumes, use a component of the England and Wales Energy Imbalance Prices for calculating the imbalance cash-out prices. Therefore any amendment to the mechanism used in England and Wales, such as that proposed for this Modification, may require a consequential amendment to the Scottish arrangements. However, this is outside of the vires of this Modification and Assessment Report, but is noted for completeness.

12 IMPACT ON ELEXON

The ELEXON Detailed Level Impact Assessment is provided in ANNEX 4 of this Assessment Report.

12.1 Proposed Modification

It is expected that ELEXON would incur effort in the region of **150 man days** for the implementation and development of the Proposed Modification P90, require an **additional 5 weeks** at the end of the development and implementation of the BSC Central Service Agent for Participant testing and regression testing.

ELEXON is impacted by the amendment to the Settlement calculations and by the consequential changes to the Settlement Report. It is believed that the amendments to TOMAS required to support the Proposed Modification are significant and will require a material amount of time and resource to implement. It is expected that this will incur **100 man days** of effort for the amendment and subsequent testing of TOMAS.

12.2 Alternative Modification

It is expected that ELEXON would incur effort in the region of **150 man days** for the implementation and development of the Proposed Modification P90, require an **additional 5 weeks** at the end of the development and implementation of the BSC Central Service Agent for Participant testing and regression testing.

ELEXON is impacted by the amendment to the Settlement calculations and by the consequential changes to the Settlement Report. It is believed that the amendments to TOMAS required to support

the Alternative Modification are significant and will require a material amount of time and resource to implement. It is expected that this will incur **100 man days** of effort for the amendment and subsequent testing of TOMAS.

13 IMPACT ON PARTIES AND PARTY AGENTS

13.1.1 Amendments to the Settlement Report

All Parties, the Transmission Company and ELEXON (as they also receive the Transmission Company variant of the Settlement Report) are impacted by the amendments to the Settlement Report, as set out in section 4.3.

However, it should be noted that Parties can determine whether they wish to continue receiving the old version of the report (i.e. without the amendments and therefore reducing the ability to accurately verify their trading charges), or the new report, with the amendments. This enables them to determine the timeframes for implementation of an amended interface independently of its development within the Central Services (unlike a 'big bang' approach). However, the impact from the implementation of amendments to the Settlement Report is still likely to be significant.

13.1.2 Verification of the Settlement Calculations

It is believed that the majority of BSC Parties recreate, to some degree, the Settlement Calculations in order to verify their Trading Charges. Therefore any amendment to the mechanism for calculating and applying the Energy Imbalance Prices will have an impact. The changes proposed by Modification P90 are significant and potentially have a large impact on system used in such verification.

The impact assessment responses from Parties indicate that this is a relatively material change for the majority of Parties responding, with the highest indication of impact being reported from several Parties as 3 to 4 months development costing around £9,000.

14 LEGAL ISSUES

None identified at this time.

15 SUMMARY OF REPRESENTATIONS

15.1 Assessment Consultation Responses

The assessment consultation (Reference 7) was issued to industry on 16 August 2002, with responses due 27 August 2002. The consultation consisted of the Requirements Specification for Modification Proposal P90 (Reference 8) and a supporting document containing some data analysis (Reference 9). The proforma for Modification Proposal P90 contained eleven questions. The questions are provided below, followed by a summary of the responses received.

It should be noted that the Transmission Company response is not included in this summary (and therefore in the number of responses and Parties quoted), as this is provided and summarised under section 16 of this Assessment Report.

In summary, fourteen responses, on behalf of fifty-seven Parties, were received in response to the assessment consultation of Modification Proposal P90. Of those fourteen responses, two responses,

two Parties, provided a 'no comment' response, and therefore the following summary does not take these two responses into consideration.

Therefore, the following summary represents the responses of twelve responses, made on behalf of fifty-five Parties.

Q1 Noting that BSAD derivation and reporting is beyond the scope of the BSC (and that any changes would be the subject of a separate Transmission Company consultation),

(a) Modification Proposal P90 proposes reporting and use of disaggregated (individual) BSAD trades in the calculation of Energy Imbalance Prices. Do you support this approach?

- Eleven responses (51 Parties) support the approach of reporting and using disaggregated BSAD in the Energy Imbalance Price calculation; and
- One response (4 Parties) does not support the approach of reporting and using disaggregated BSAD in the Energy Imbalance Price calculation.

Comments made in support of this approach:

- Using disaggregated BSAD trades in the proposed manner creates consistency in the treatment of energy balancing actions;
- Using disaggregated BSAD trades improves the transparency of the Energy Imbalance Price calculation and of Transmission Company forward trades; and
- Using disaggregated BSAD trades provides the same level of transparency to pre Gate Closure Transmission Company trades, as is currently the case for post Gate Closure actions.

Q1 **(b)** In your opinion, should disaggregated BSAD trades for use in the Energy Imbalance Price calculation be time constrained in any way, for example, limiting 'eligible trades' to those made within a specified time period prior to the Settlement Period?

- Ten responses (49 Parties) believe that there should be no time constraint on the BSAD trades included in the Energy Imbalance Price calculation;
- One response (2 Parties) believes that there should be a time constraint on the BSAD trades included in the Energy Imbalance Price calculation; and
- One response (4 Parties) made no comment in respect of this point.

Comments made in support of not time constraining forward trades:

- Time constraining forward trades to exclude trades with a greater lead time would be countered by the risk of incorrect trades. The incentives on the system operator should be sufficient to ensure that they trade in the most efficient and optimal manner;
- All forward trades made by the Transmission Company for a specific Settlement Period should be included, regardless of how far out they were taken;
- Any time constraint would be arbitrary and subjective; and
- The Transmission Company should be trading for the purposes of balancing the system and therefore all trades are relevant to the imbalance cash-out calculations.

Comments made in support of time constraining forward trades:

- Inclusion of longer term trades would have the affect of artificially half-hourly price signals, assuming a flat strike for all relevant Settlement Periods.

Q2 Modification Proposal P90 proposes a new mechanism for differentiating between system and energy balancing actions. This new mechanism negates the requirement for the Continuous Acceptance Duration Limit (CADL), do you support this approach?

- Five responses (29 Parties) support the approach of removing CADL; and
- Seven responses (26 Parties) do not support the approach of removing CADL.

Comments made in support of removing CADL:

- CADL is arbitrary and its effectiveness at differentiating between system and energy balancing actions is not proven; and
- CADL is arbitrary and the mechanism over complicates the Energy Imbalance Price setting process. The inclusion of forward trades into the price stacks should help to undercut those trades which would have set very high prices and would have been removed by CADL.

Comments made in support of not removing CADL:

- Conceptually, CADL is a better mechanism for differentiating between system and energy trades;
- Energy is traded ahead of Gate Closure at the Settlement Period level, so any actions taken by the Transmission Company of less than CADL must be considered for system balancing purposes;
- CADL was implemented specifically to remove the impact of short duration Bid – Offer Acceptances, that have a disproportionate impact on the Energy Imbalance Prices. This Modification has been successful and there is no conclusive evidence that this impact will not again be felt if CADL is removed;
- Removing CADL will mean that system balancing actions will set the Energy Imbalance Price even where BRL = 5 MWh if the system action is the only accepted Offer, a relatively frequent scenario where the system is long; and
- If CADL is to be removed, then De Minimis tagging should also be removed, to leave De Minimis tagging in, whilst removing CADL tagging seems arbitrary and unjustifiable.

Q3 In your opinion, does Modification Proposal P90 give a better separation of balancing actions (i.e. system vs energy) used in setting the Energy Imbalance Price(s), if so, how?

- Six responses (30 Parties) believe that P90 gives a better separation of balancing actions; and
- Five responses (25 Parties) do not believe that P90 gives a better separation of balancing actions.

Comments made in support of P90 providing a better separation:

- Genuine system trades (that have a compensating opposite action) do not influence cash-out prices, whilst ensuring that trades that impact energy balance are better represented in Energy Imbalance Prices;

- The inclusion of all Bid – Offer Acceptances and Transmission Company forward trades in the derivation of the main and reverse price, followed by Trade Tagging, avoids potentially arbitrary allocation of system and energy trades and provides transparency;
- Use of individual forward trades and Bid – Offer Acceptances in the price stacks must be more cost-reflective than use of aggregated blocks of information; and
- P90 provides for a much simpler, consistent and less arbitrary separation of system and balancing actions.

Comments made in support of P90 not providing a better separation:

- P90 gives a different, although not necessarily better, separation of system and energy balancing actions. Under the current system, BRL is used to remove Bid – Offer Acceptances deemed to have been taken for the purposes of providing Balancing Reserve, and hence taken for system reasons. It seems to defeat the purposes of the proposal to set the reverse Energy Imbalance Price using a volume of system energy;
- A key feature of P90 is that it assumes that some balancing actions taken in the opposite direction to the overall system imbalance were taken for energy balancing purposes (by retention of BRL). This will not always be true and will therefore not improve the separation of system and energy balancing actions relative to the current baseline; and
- The removal of CADL could cause the pollution of Energy Imbalance Prices with highly priced system balancing actions where actions in the opposite direction to the overall system imbalance are small in number / volume / duration.

Q4 In your opinion, is Modification Proposal P90 and the proposed use of BRL for price setting in the reverse stack and for the calculation of the reverse imbalance volume (RIV) for the main price calculation valuing actions more correctly, please provide rationale for your response?

- Six responses (30 Parties) believe that P90 values actions more correctly;
- Five responses (24 Parties) do not believe that P90 values actions more correctly; and
- One response (1 Party) made no comment in respect of this point.

Comments made in support of P90 valuing actions more correctly:

- Calculating the main price from the Remaining Imbalance Volume (RIV) will better represent trades for energy imbalance purposes;
- The mechanism proposed by P90 will eliminate more system balancing actions;
- BRL has the merit that it can be representative of historical levels of regulating reserve which the Transmission Company holds for energy balancing purposes. It therefore provides a means of transparently (and with a degree of accuracy) separating energy and system balancing actions / trades;
- It is appropriate to use BRL as a reference point for identifying those actions which can be removed from the main stack to derive a main price largely based on energy balancing actions. However, if P90 (or an Alternative) were to be approved, there would be a case for reviewing the level of BRL, as all balancing actions are being included in the Energy Imbalance Price calculation, not just actions taken in the Balancing Mechanism Window;

- Prices for the reverse stack should be derived from actions taken to achieve half hourly energy balance on the reverse stack, and the use of BRL values these actions appropriately; and
- The use of Remaining Imbalance Volume (RIV) provides a simple and transparent measure of the actions taken to achieve energy balance on the main stack.

Comments made in support of P90 not valuing actions more correctly:

- The P90 mechanism is based on the use of a notional (and arbitrary) BRL. The underlying assumption of P90 is that use of BRL correctly identifies energy balancing trades in the reverse stack. However, if no reverse trades have actually occurred, which will often be the case due to the endemic length of the system, then by definition the methodology is not cost-reflective and not valuing actions more correctly; and
- Energy Imbalance Prices are more likely to be influenced by inappropriate system constraint prices.

Q5 In your opinion, does Modification Proposal P90 with the reverse price set by BRL in the shorter stack more correctly targets the cost of energy balancing actions to those causing the imbalance over the current baseline?

- Six responses (14 Parties) believe that P90 more correctly targets the cost of energy balancing actions;
- Four responses (19 Parties) do not believe that P90 more correctly targets the cost of energy balancing actions;
- One response (21 Parties) does not believe that there is any change over the current baseline; and
- One response (1 Party) made no comment in respect of this point.

Comments made in support of P90 targeting the cost of energy balancing more correctly:

- P90 reduces the penal aspect of imbalance cash-out for Parties;
- P90 removes the arbitrary split between energy and system trades;
- The main price is set on the basis of the net imbalance of the market and the requirement for regulating reserve, whilst the reverse price is set on the basis of the requirement for regulating reserve only. In both, the full set of trades is included at a disaggregated level;
- By seeking to tag out system balancing actions, P90 may help to target energy balancing costs more effectively and encourage Parties to balance (however, this view is caveated in respect of the removal of CADL, which should be retained); and
- The combined application of BRL and the Remaining Imbalance Volume results in prices that more accurately reflect the cost of half-hourly energy balancing over the current baseline. Parties that cause imbalance will not be exposed to the impact of system constraints, but prices will properly reflect the cost of all net balancing actions on those Parties.

Comments made in support of P90 not targeting the cost of energy balancing more correctly:

- A number of responses indicate that their (negative) responses to questions 3 and 4 are also true for this question, namely that the potential for the mechanism proposed by P90 has the

potential to include more system balancing actions in the Energy Imbalance Prices, and therefore this cannot be considered to better target the cost of energy balancing on Parties.

Q6 In your opinion, does Modification Proposal P90 with the reverse price set from BRL in the shorter stack address the issue of asymmetric risk?

- Seven responses (35 Parties) believe that P90 could have the effect of reducing asymmetric risk; and
- Five responses (20 Parties) do not believe that P90 addresses the issue of asymmetric risk.

Comments made in support of P90 addressing asymmetric risk:

- P90 may reduce asymmetric risk if there is a change in participants perception of risk and their behaviour. This should impact on the overall length of the market;
- The Energy Imbalance Prices causing the asymmetry will be a more accurate reflection of energy balancing actions and will therefore be better than the current baseline;
- It is likely that the inclusion of all trades at a disaggregated level will make it less likely that extreme prices are set, for the reverse price in particular, dampening the effects of asymmetry; and
- Moving to prices more firmly based on energy balancing actions and with a greater equivalence of pre and post Gate Closure actions may increase liquidity and competitiveness in the pre Gate Closure market, helping Parties to balance their positions and reduce imbalance costs.

Comments made in support of P90 not addressing asymmetric risk:

- No, as prices will remain low for System Sell Price, even when the system is short; and
- The removal of CADL could lead to an increase in volatility in the reverse price, especially System Buy Price in a long market.

Q7 In your opinion, does P90 provide benefits in terms of greater transparency and simplicity of the energy imbalance price calculations?

- Nine responses (43 Parties) believe that P90 provides benefits from the transparency and simplicity of the Energy Imbalance Price calculations;
- One response (4 Parties) do not believe that P90 provides benefits from the transparency and simplicity of the Energy Imbalance Price calculations; and
- Two responses (8 Parties) made no comment in respect of this point.

Comments made in support of the P90 mechanism being beneficial in terms of simplicity and transparency:

- P90 is more transparent due to better treatment of Transmission Company forward trades and the provision of individual trades;
- Removing the subjective treatment of pre Gate Closure actions as system or energy balancing may also improve both transparency and simplicity; and
- Elimination of CADL increases simplicity.

Comments made in support of the P90 mechanism not being beneficial in terms of simplicity and transparency:

- P90 is simple, to a degree, and is more transparent due to better treatment of Transmission Company forward trades, but it is not necessarily the best solution;
- Whilst it is agreed that P90 provides greater transparency, it has the potential to generate greater volatility in the Energy Imbalance Prices; and
- P90 will simplify the Energy Imbalance Price calculation slightly and is therefore slightly more transparent, however, it still retains some complexities, for example, De Minimis Acceptance removal.

Q8 In your opinion how does Modification P90 affect any of the following issues (identified during discussion on Modifications P74 and P78):

- the relative reward for notified and instructed actions and the impact on the Transmission Company's balancing of the system;
- the perceived risk of Bid - Offer submission, the level of participation seen in the Balancing Mechanism and impact on system balancing;
- changes in Physical Notifications shortly before Gate Closure;
- changes in the level of asymmetric risk;
- changes to the incentives on parties to balance their individual (contractual) trading positions before Gate Closure;
- changes to the incentives for parties as a whole (i.e. in total, even if not balanced on an individual basis) to balance the market before Gate Closure;
- the effect on Parties anticipating the 'direction' of the market, and therefore the Energy Imbalance Price, leading to volume volatility and consequential price instability in the market;
- affect on liquidity and prices in the forwards and spot markets, the interrelation of forwards and spot markets with Energy Imbalance Prices and also the level of Energy Imbalance Prices themselves;
- the risk levels of different categories of party from the implementation of Modification Proposal P90; and
- any other issues identified with respect to Modification Proposals P74 and P78.

Q9 Do you believe that Modification Proposal P90 better facilitates achievement of the Applicable BSC Objectives, if so, which one(s) and why?

- Nine responses (43 Parties) believe that P90 better facilitates achievement of the Applicable BSC Objectives;
- Two responses (11 Parties) do not believe that P90 better facilitates achievement of the Applicable BSC Objectives; and
- One response (1 Parties) made no comment in respect of this point.

Comments made in support of P90 better facilitating achievement of the Applicable BSC Objectives:

- P90 will better facilitate achievement of BSC Objectives (b) and (c) by improving trading liquidity and by more efficient operation;
- P90 will improve the transparency of trade reporting which will encourage the Transmission Company to operate the Transmission System in a more efficient, economic and co-ordinated manner;
- Simplification of the Energy Imbalance Price calculations will improve efficiency in the implementation and administration of the balancing and settlement arrangements;
- The P90 mechanism more accurately targets the costs of the system operator's balancing actions;
- Efficient competition requires cost reflective and accurate imposition of costs to participants, which P90 better achieves;
- BSC Parties would have more information about the Transmission Company's actions and would therefore be more able to be more active in the pre Gate Closure market in order to balance their positions, therefore assisting the Transmission Company in balancing the system; and
- The increased transparency surrounding the Transmission Company's balancing actions could help to stimulate liquidity in the short-term markets, thus improving competition.

Comments made in support of P90 not better facilitating achievement of the Applicable BSC Objectives:

- The reduced separation of system and energy balancing actions does not better target costs to those causing the energy imbalance and cost-reflectivity is of great importance.

Q10 Do you believe that any (or all) of the potential Alternatives to Modification Proposal P90 better facilitate achievement of the Applicable BSC Objectives than Modification Proposal P90?

Option1: Dynamic BRL (Real time);

Option 2: Dynamic BRL (Average);

Option 3: Reverse Price set from Main Stack;

Option 4: Reverse Price set from Main and Reverse Stack; and

Option 5: Reverse Price set from First Bid – Offer Acceptance on Main Stack.

Do you have a preference for one of the proposed options?

- Six responses (26 Parties) did not express a preference for any of these options;
- Three responses (26 Parties) expressed a preference for Option 1 and 2; and
- Three responses (3 Parties) expressed a preference for Option 5.

Is there any other potential Alternative that should be considered?

- One response proposed an Alternative based on the Modification Proposal P90 mechanism, but retaining CADL.

Q11 Are there any other issues that you believe should be considered during the assessment of Modification Proposal P90?

- The best P90 solution should be compared to Alternative Modification P78;
- The Modification is based on the concept that a system trade has an equal volume compensatory action, which is believed to be a feature of the current Trade Tagging mechanism and not a fundamental truth; and
- Seeking to achieve price transparency and simplicity without increasing price spikes and price volatility.

16 SUMMARY OF TRANSMISSION COMPANY ANALYSIS

16.1 Response to First Request for Analysis

The request to the Transmission Company for analysis in relation to Modification Proposal P90 was provided in the form of the assessment consultation proforma provided to industry, in parallel with the assessment consultation undertaken. The following is the response of the Transmission Company, in full:

Q	Question	Response (Please provide rationale where possible)
1.	Noting that BSAD derivation and reporting is beyond the scope of the BSC (and that any changes would be the subject of a separate Transmission Company consultation), **(a)** Modification Proposal P90 proposes reporting and use of disaggregated (individual) BSAD trades in the calculation of Energy Imbalance Prices. Do you support this approach?	Any modification must be assessed on whether the proposed change would make the BSC better meet its applicable objectives. As BSAD is not provided under the BSC, changes to BSAD cannot be used to justify support for P90. Such support must be on the basis that the resultant imbalance prices better meet the applicable objectives. As described in our response to Q2, we do not believe that disaggregation of BSAD is required in order to achieve more cost reflective imbalance prices.
	(b) In your opinion, should disaggregated BSAD trades for use in the Energy Imbalance Price calculation be time constrained in any way, for example, limiting 'eligible trades' to those made within a specified time period prior to the Settlement Period?	No, the existing concept of BSAD is that it contains all relevant trades for the applicable period. We believe that this should be retained.
2.	Modification Proposal P90 proposes a new mechanism for differentiating between system and energy balancing actions. This new mechanism negates the requirement for the Continuous Acceptance Duration Limit (CADL), do you support this approach?	No, CADL was implemented because it better facilitates the achievement of the BSC objectives by augmenting the existing Trade Tagging system and providing better cost targeting by seeking to remove system balancing costs from the energy imbalance price. If CADL were removed, it is likely that there would be an increase in the incidence of imbalance price spikes that did not reflect the price of energy in the Balancing Mechanism.
3.	In your opinion, does Modification Proposal P90 give a better separation of balancing actions (i.e. system vs energy) used in setting	No, the existing system is imperfect, as we believe that the reverse stack is mainly made up of system balancing actions (P78 was raised to address this issue). P90 does not address this as it retains the

Q	Question	Response (Please provide rationale where possible)
	the Energy Imbalance Price(s), if so, how?	reverse stack in the imbalance price calculation and relies upon the level of BRL for the separation of system and energy. In cases where there are no energy actions in the reverse stack, the resultant imbalance price will clearly be based on a system action.
4.	In your opinion, is Modification Proposal P90 and the proposed use of BRL for price setting in the reverse stack and for the calculation of the reverse imbalance volume (RIV) for the main price calculation valuing actions more correctly, please provide rationale for your response?	No, using the reverse stack will pollute the reverse price with system actions. This also applies to the main stack as the system actions that are currently removed under the existing methodology (CADL and System Trade volumes) are re-introduced to potentially set the imbalance prices, see response to Q5. At times this will make imbalance prices more onerous, to the detriment of those spilling or shortfalling.
5.	In your opinion, does Modification Proposal P90 with the reverse price set by BRL in the shorter stack more correctly target the cost of energy balancing actions to those causing the imbalance over the current baseline?	No, consider the example of a long market where zero offers are taken in the balancing mechanism and the only buy trades are for system actions. The reverse price (SBP) will be set by the price of that trade. See graph 3 in the analysis where SBP spiked at £300/MWh in period 35 on 9 July 2002. Under the present baseline, system actions are excluded from BSAD.
6.	In your opinion, does Modification Proposal P90 with the reverse price set from BRL in the shorter stack address the issue of asymmetric risk?	No, with the potential for continuing price spikes in SBP, the market will continue to take a long position.
7.	In your opinion, does P90 provide benefits in terms of greater transparency and simplicity of the energy imbalance price calculations?	The apparent simplicity of the P90 concept cannot be seen as a benefit or any justification towards its implementation. We support the calculation of imbalance prices that achieve cost reflectivity and properly target those participants causing energy imbalance. With regard to transparency the issue of disaggregated forward energy trades is not within the scope of the BSC and should only be assessed in a consultation on National Grid's Procurement Guidelines.
8.	In your opinion how does Modification P90 affect any of the following issues (identified during discussion on Modifications P74 and P78): • the relative reward for notified and instructed actions and the impact on the Transmission Company's balancing of the	In the Assessment phase for P74/P78 the issues identified centred around how both modification introduced a market length indicator before deciding which imbalance price participants should be cashed out at. As P90 relies upon the existing application of SBP/SSP to an individual account the incentive on participants will be similar to the existing baseline.

Q	Question	Response (Please provide rationale where possible)
	system; • the perceived risk of Bid - Offer submission, the level of participation seen in the Balancing Mechanism and impact on system balancing; • changes in Physical Notifications shortly before Gate Closure; • changes in the level of asymmetric risk; • changes to the incentives on parties to balance their individual (contractual) trading positions before Gate Closure; • changes to the incentives for parties as a whole (i.e. in total, even if not balanced on an individual basis) to balance the market before Gate Closure; • the effect on Parties anticipating the 'direction' of the market, and therefore the Energy Imbalance Price, leading to volume volatility and consequential price instability in the market; • affect on liquidity and prices in the forwards and spot markets, the interrelation of forwards and spot markets with Energy Imbalance Prices and also the level of Energy Imbalance Prices themselves; • the risk levels of different categories of party from the implementation of Modification Proposal P90; and • any other issues identified with respect to Modification Proposals P74 and P78	However, the re-introduction of CADL volumes and introduction of system trades has the potential to spike the imbalance prices. This will tend to increase the asymmetry of risk. Note: for the example given in Q5, those accounts that were short on a long market would pay SSP under P74; Market Price under P78; but still SBP under P90.
9.	Do you believe that Modification Proposal P90 better facilitates achievement of the Applicable BSC Objectives, if so, which one(s) and why?	No, P18A was implemented on the basis that it better met the applicable objectives. The case has not been made that this decision was either wrong, or circumstances have changed such that it should be reversed. We also believe that the price spikes experienced since go-live demonstrate the difficulties associated with Automatic Trade Tagging and do not support its wider use at this time.
10.	Do you believe that any (or all) of the potential Alternatives to Modification Proposal	No, all the options in the Requirement Specification remove CADL and for the reasons given above, we

Q	Question	Response (Please provide rationale where possible)
	P90 better facilitate achievement of the Applicable BSC Objectives than Modification Proposal P90? Option1: Dynamic BRL (Real time); Option 2: Dynamic BRL (Average); Option 3: Reverse Price set from Main Stack; Option 4: Reverse Price set from Main and Reverse Stack; and Option 5: Reverse Price set from First Bid – Offer Acceptance on Main Stack. Do you have a preference for one of the proposed options? Is there any other potential Alternative that should be considered?	do not believe this would better meet the applicable objectives.
11.	Are there any other issues that you believe should be considered during the assessment of Modification Proposal P90?	The modification is based upon the concept that a "genuine system trade" has an equal volume compensatory action. We believe that this is a feature of the current Automatic Trade Tagging and not a fundamental truth. For example, consider a short system that requires additional generation to satisfy a system constraint whose volume also brings the system into balance.

16.2 Transmission Company Response to M0009 (Impact Assessment Request)

The Impact Assessment request was issued to the Transmission Company, in parallel with the request to industry. The following represents the Transmission Company response in full:]

What impact, if any, will the proposed Modification or its potential alternatives have on your organisation?

The changes proposed would impact on our internal systems and would require changes to existing software.

These systems would be further impacted if the developments for P90 prompted any modifications to the SAA IO14 flow.

In addition to BSC Systems changes we are aware that P90 would require a BSAD change.

What implementation timescale would you require for the proposed Modification or potential alternatives?

For software changes only, and assuming the SAAI014 flow is unaffected, a minimum of 3 months from the Authority decision would be required for implementation. However, this does not take into account additional requirements for BSAD changes as outlined below.

We are aware that the overall objectives of P90 will require a BSAD change. We have arranged to meet with the proposer of P90 in order to understand more fully the required changes to BSAD. Any proposed changes will need to be consulted upon and it is only after this consultation that we will be able to confirm the exact impact of the changes to the systems that support the BSAD process.

Any implementation timescale would have to accommodate existing and ongoing development work including that being progressed on P74/78 changes which, are already scheduled on a tight delivery timescale once a decision from Ofgem is received. We would be unable to provide resource to support additional work for P90 until after any P74/78 project had been completed.

ANNEX 1 – PROPOSED TEXT TO MODIFY THE BSC

a Proposed Modification P90

Legal text will be finalised prior to being issued as a final draft in the Modification Report.

b Alternative Modification P90

Legal text will be finalised prior to being issued as a final draft in the Modification Report.

ANNEX 2 – BSC PARTY CONSULTATION RESPONSES

a Assessment Consultation Responses

See attached document:

MAR090_Annex 2

Representations were received from the following Parties:

No	Company	File Number	No. Parties Represented
1.	Williams Energy	P90_ASS_001	1
2.	Entergy-Koch Trading Ltd	P90_ASS_002	1
3.	NGC	P90_ASS_003	1
4.	SEEBOARD	P90_ASS_004	1
5.	British Gas Trading	P90_ASS_005	1
6.	TXU	P90_ASS_006	21
7.	Aquila Networks	P90_ASS_007	1
8.	British Energy	P90_ASS_008	1
9.	Powergen	P90_ASS_009	4
10.	Scottish Power	P90_ASS_010	5
11.	Edison Mission	P90_ASS_011	2
12.	Innogy	P90_ASS_012	7
13.	Scottish and Southern	P90_ASS_013	4
14.	Immingham CHP (late response)	P90_ASS_014	1
15.	LE Group (late response)	P90_ASS_015	7

b Detailed Level Impact Assessment Responses

Responses for MC00009 – Detailed Level Impact Assessment of Modification Proposal P90

Carried out by	Comments
Dave Morton SEEBOARD	What impact, if any, will the proposed Modification or its potential alternatives have on your organisation? **Requires amendment to one of our systems.** What implementation timescale would you require for the proposed Modification or potential alternatives? **Three months should be adequate given current definition of changes.**
Ros Parsons Npower Ltd, Npower Direct Ltd, Npower Yorkshire Ltd	What impact, if any, will the proposed Modification or its potential alternatives have on your organisation? **The implementation of P90 will include 5 extra fields on the S0141. As these would be used to calculate SBP and SSP, which is outside the scope of SONET, the only changes required in SONET would be to allow the loading of the revised flow. We estimate that the cost would be approximately £9000.** What implementation timescale would you require for the proposed Modification or potential alternatives? **3 months.**
Margaret Brunton Npower Northern Ltd	What impact, if any, will the proposed Modification or its potential alternatives have on your organisation? **The implementation of P90 will include 5 extra fields on the S0141. As these would be used to calculate SBP and SSP, which is outside the scope of SONET, the only changes required in SONET would be to allow the loading of the revised flow. We estimate that the cost would be approximately £9000.** What implementation timescale would you require for the proposed Modification or potential alternatives? **3 months.**
Rachel Ace British Energy	What impact, if any, will the proposed Modification or its potential alternatives have on your organisation? **It will impact several of our systems** What implementation timescale would you require for the proposed Modification or potential alternatives? **3 months**
Sue Macklin Scottish and Southern	What impact, if any, will the proposed Modification or its potential alternatives have on your organisation. **This will require a number of system changes - medium impact** What implementation timescale would you require for the proposed Modification or potential alternatives? **4 months**
Man Kwong Liu Scottish Power	What impact, if any, will the proposed Modification or its potential alternatives have on your organisation? **Significant impacts on at least 5 of our systems**. What implementation timescale would you require for the proposed Modification or potential alternatives? **Whilst the actual changes are not yet defined in detail, a high level estimate of the effort required is 100 days with at least 6 months notice of implementation being required.** Other comments: **We note that, in effect, the proposal would be making changes to the same areas that have recently been changed in BSC Systems Release 2 and, in some cases, would result in the changes recently made being removed. We would, therefore, reiterate our support for a holistic approach to pricing issues, rather than the present piecemeal situation, which is clearly inefficient and wasteful of money and resources.**

Carried out by	Comments
Liz Anderson LE Group	**LE Group's response is the same for the original modification and all its alternatives.** What impact, if any, will the proposed Modification or its potential alternatives have on your organisation? **This modification proposal would have a significant commercial but minimal system effects.** What implementation timescale would you require for the proposed Modification or potential alternatives? **We would like a minimum 6 week notice period to allow our organisation to prepare for the commercial impact of implementation.**
Edward Coleman TXU	What impact, if any, will the proposed Modification or its potential alternatives have on your organisation? **We support the proposal; it would mean modification to out systems and processes.** What implementation timescale would you require for the proposed Modification or potential alternatives? **The impact is classed as light to medium therefore a timescale of 3 months is applied.**
Rachael Gardener Aquila Networks	Please find that Aquila Networks Plc response to MC00009: DLIA of P90 is 'No Comment'.

ANNEX 3 – BSC AGENT IMPACT ASSESSMENTS

NETA Change Form	**MP/CP/TP No: MP90** **Logica reference:** ICR408
Title: Improving The Representation Of Energy Balancing Actions In Cashout Prices	
Identified by: ELEXON	**Date received:** 14/8/02

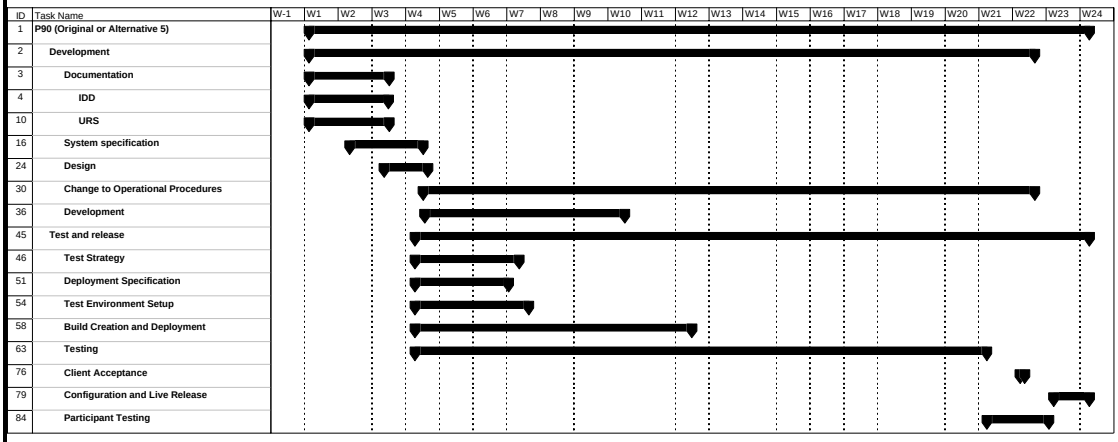
Statement of requirement
Baseline affected: NETA Service Definition Baseline (V1.0)
Assumed changes over baseline: None
Description of Change: See attached original MP90
Proposed solution: See attached original MP90
Justification for Change: See attached original MP90
Proposed changes to Service Levels: None
Proposed changes to the Agreement: None
Attachments/references: MP90

To be completed by Logica			
	High Level Impact Assessment	Detailed Level Impact Assessment	Quotation
Tick which stage is being completed:		✓	
Signed by Logica Contract Manager:			
Date:		2/9/02	
HLIA category: Small/Medium/Large/Other		Price for DLIA:	
If this is a Quotation, are consequential modifications needed to the DLIA? Yes/No.			

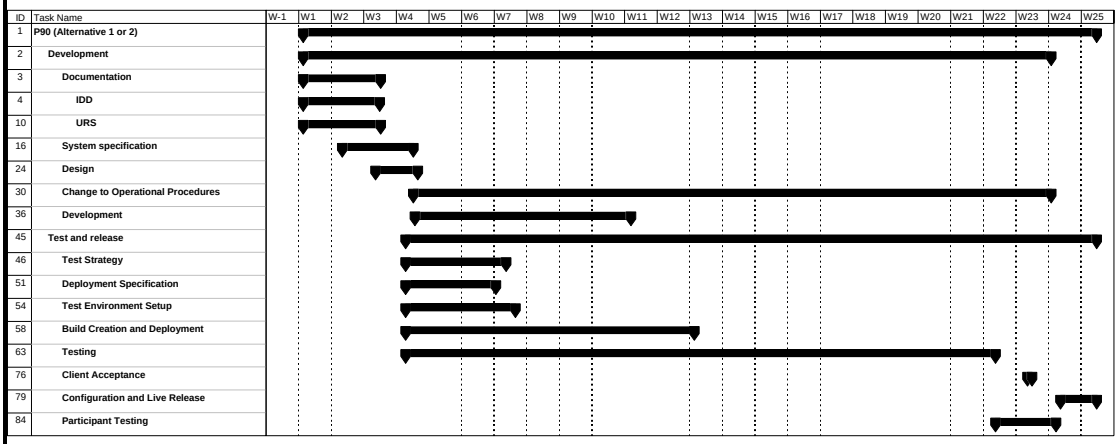
Logica's proposal
Logica's understanding of the requirement: This Modification Proposal seeks to amend the mechanism for formulating and reporting BSAD trades and to the calculation of the Energy Imbalance Price. Currently, the energy proportion of forward trades is reported on a gross basis as BSAD for use in the EIP calculation. This proposal seeks to report these forward trades on an individual basis rather than gross. This will then allow the individual BSAD trades to be included at the relevant point in the stack, which is ultimately used to calculate the EIP.
Logica's proposed design solution: See attached Design solution for P90
Consequential changes to Project Deliverables: SAA, BMRA
Consequential impact on BSC Service Users or Other Service Providers:
Testing strategy: • Formal testing will only be performed on our own system and will include performance/volume testing. External interfaces will be simulated as necessary. • No allowance has been made for ELEXON to witness testing.
Management plan for developing the Change:

Project plan for developing the Change:

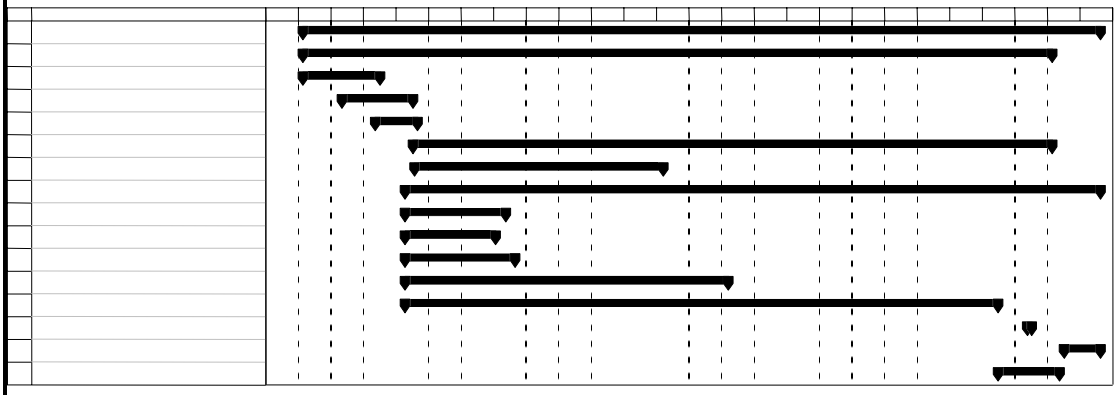
Original or Option 5 (24 weeks)



Options 1 or 2 (25 weeks)



Options 3 or 4 (25 weeks)



Method of deployment:

Patch/~~Release~~	Is a planned outage required? Yes/~~No~~

Price for Design and Build:

Item description:	Price (ex VAT)	Type of price:
Develop P90 or Option 5	£755,400	Fixed
Develop Option 1 or Option 2	£774,500	Fixed
Develop Option 3 or Option 4	£785,500	Fixed

Price for Operate and Maintain:

Item description:	Price per month (ex VAT)	Type of price:
Operate	£0	Fixed
Maintain		
P90 or Option 5	£8,813	Fixed
Option 1 or Option 2	£9,036	Fixed
Option 3 or Option 4	£9,164	Fixed

If this is a DLIA or Quotation, is a price breakdown in the agreed format attached? Yes/~~No~~

Terms attaching to the offer

Validity period of offer: 30 days	**Type of offer:** Firm

Assumed start date:

Payment milestones:

Logica will invoice 30% on receipt of Purchase Order 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.

Document turnaround time:
5 days

Impact on Service Levels:
None

Impact on performance of the System:

Other terms:

If this is a Quotation, is a draft contract amendment attached? Yes/No

Responsibilities of ELEXON:

- For all DCRs which are subject to review, Logica shall provide one draft issue and a maximum of 5 working days has been allowed for ELEXON to review and comment on the updates. Comments will be addressed and the final issue will be provided. A maximum of 2 working days has been allowed for review confirmation and signoff by ELEXON.
- Within reasonable levels, ELEXON will make available appropriate staff to assist Logica during the development of this change.

Assumptions made by Logica:

- Price is for a separate patch to be deployed after Release 2.
- Price and duration assume that this change is developed in isolation and the effects of other changes are excluded.
- Price excludes provision for indexation of daily rates from 1st April 2003.
- Price is for creating DCRs, not a formal documentation issue.
- No allowance is included in the price for Service Descriptions being different from the Change/Modification Proposal.
- As the service has to support reconciliation runs for pre-P90 settlement dates, redundant functionality will have to be retained.
- No allowance has been made for upgrading the hardware with additional hard disk drives. The need to increase the storage capacity of the system will remain uncertain until the volumetrics associated with this change have been established.

Options and alternatives:

Design Solution

P90

Document Changes

	BMRA	CDCA	CRA	ECVAA	SAA	TAA
URS	F004 I014 Ixxx Iyyy				F009 I014 I026 Ixxx Iyyy	
SS	Y				Y	N/A
DS	Y				Y	N/A
MSS	Y				Y	N/A
OSM	Y				Y	

IDD	Part 1 document	SAA-I014-1
	Part 1 spreadsheet	SAA-I014-1
	Part 2 document	SAA-I014-2 SAA-I014-3 SAA-I026=BMRA-I014 SAA-Ixxx=BMRA-Ixxx SAA-Iyyy=BMRA-Iyyy
	Part2 spreadsheet	SAA-I014-2 SAA-I014-3 SAA-I026=BMRA-I014 SAA-Ixxx=BMRA-Ixxx SAA-Iyyy=BMRA-Iyyy

Software Changes

1. Amend BSAD loader to only load price adjustments
2. Add 2 new loaders for forward trades
3. Amend database to hold trades
4. Add Web page, TibCo, csv for forward trades
5. Produce Oracle form to allow manual amendment of trade data
6. Amendment to SAA I014 (3 sub-flows) to report trade data
7. Amendments to trade tagging calculations to use forward trades and acceptances
8. Amendments to price derivation

The additional changes needed for the alternatives are:

Option 1: Minor change to new BSAD flow, web pages

Option 2: As 1 (although derivation before sending to central systems differs)

Option 3: More complex computation

Option 4: More complex computation

Option 5: Minor change to new rules

Assumptions/Questions/Issues

1. The current format of files from NGC does not support nested groups. To keep in line with other flows, I would, therefore, expect to:

   a) amend BSAD flow to contain price adjustments only with other fields zero [all fields would be used for pre P90 settlement dates]

b) b) add two new flows - forward sales and forward purchased each denormalised. Could use one flow with sale/purchase flag if preferred

2. Redundant functionality must be retained in order to support reconciliation runs for pre-P90 settlement dates. To this end, the software will have to use a system parameter to determine which calculation rules apply (or even which calculation executable to invoke). In addition, and redundant fields in reports will be retained and reported as zero or null for post P90 settlement dates, new fields will be reported as zero or null for pre-P90 settlement dates. This dual functionality relates to the software, design documentation (including URS) and service description - the service has to be able to support reconciliations.

Testing

Core Business Functionality Testing

- The Regression Scripts RT-02, RT-04 and RT-11 will be updated to take account of the new BSAD flow and changes to the settlement report and web publishing.
- Regression Scripts RT-01, RT-02 perform data set-up and these as well as RT-04, RT-10 and RT-11 will be executed in both Dry and Main runs.

System Testing

- System tests R2T-22, R2T-27 and R2T-28 will be updated.
- These three tests will be executed in both Dry and Main Runs.

Change Specific Testing

- Four new test scripts (including one for Performance/Volume testing) will be developed to handle the new functionality.
- These tests will be executed in Dry, Interim and Main Runs.

ANNEX 4 – BSCCO IMPACT ASSESSMENTS

Mod No.	P90	**Title:**	**Improving The Representation Of Energy Balancing Actions In Cashout Prices.**		
Assessor Name	Phil Clinch	**Assessor Team**	CVA Programme	**Date**	21 August 2002

Modification Summary: see modification

Summary of solution(s):
Detailed Level Impact Assessment: As no impact assessment from Logica has been carried out at this point in time, it is not possible for the CVA Programme to provide impact assessments against the five identified options in the Modification P90 Requirements Specification document P090AS. This DLIA is therefore based on the impact of P74/78.
High Business Risk (price calculation is within operational audit scope), High complexity (change to calculation) and High Impact (interface changes – probable from NGC & to Parties) Lots of Config Items impacted

Product Affected Reference This should include:	**Target Issue**	**Cost of Embodying CP – Man Days**
• Impact on NETA Services; (review)		
• BMRA, SAA URS • IDD • BMRA, SAA SS (DS) • OSM	**TBD**	**21**
• Code and Code Subsidiary Documents		**12**
• BSC sections tbd • BMRA, SAA Service Descriptions • NDFC • REP Cat • BSCP01 (maybe)		
• Business definition documents (review)		**3**
• BPM		
• Impact on flows (new/amended/deleted/BSC party impact); (manage party/NGC communications)		**10**
• ?SAA-I014 • ?NGC-BMRA		
• ?NGC-ELEXON		**15**
• Impact on BSCCo systems/processes (review/manage)		

• TOMAS • ?MDM & Web site • Other • Regression testing • Participant testing		**15**
Additional Project documentation • Release plan (assume part of planned release) • Test Strategy (assume part of planned release • Business Requirements Solution • Participant Test Specification • Participant Test report • Deployment Plans (part of planned release)		2md 5md 5md 15 md 5 md
Additional Audit activities (PwC)?		6%
Somewhere between 50 and 130 md effort from project (£30k - £80k) + audit costs		130 md, £80k

Impact on other Systems[4] –
NGC?

Assumptions[1] –

1. Assumed part of a planned release and does not require a separate BRS, Test Strategy, Plan and deployment plan;
2. As this has gone direct to DLIA, the CVA Programme have not seen any analysis by Logica. This analysis is therefore base on the assumption that the impact is no more than for Modifications P74/78
3. No additional analysis is required once Mod approved i.e the analysis will be completed prior to authorisation
4. May be pretty complex set of changes to the price calculation, so suggest some additional test scenarios based on live data and matching output with TOMAS.
5. PTS will be available for structured testing in appropriate timescale

Issues and Risks[1] –

1. High Business Risk – this mod falls within the scope of the operational audit and within the materiality criteria. It is therefore high business risk. It is also at the top end of High complexity (complex changes to complex calculation) and high scope/impact (changes to existing flows,)

Related CPs[1]
P74, P78?

Comments[1]
There are now three modifications in the pipeline relating to complex changes to the pricing calculations – P74, P78 and now P90. If all three are approved by the Authority then it would be considerably more efficient to implement all three at the same time. This would also minimise the impact on Parties. This poses a 'timing' issue that would need to be addressed in the Assessment Reports for P74 and P78 as well as for P90.

[4] This field is not mandatory

BSCSDP IA for Mods in assessment	TARGET RELEASE	
Type	**Item**	**P90**
BSC	Section P	
BSC	Section Q	?
BSC	Section T	?
BSC	Section X Annex X-1	
BSC	Section X Annex X-2	?
BSC	Section X Annex X-3	
BSC Procedures 01	Settlement calendar	?
BSC Procedures		
BSC Procedures		
Service Descriptions	SAA	X
Service Descriptions	BMRA	X
Service Descriptions	ECVAA	
Service Descriptions	CDCA	
Service Descriptions	TAA	
Service Descriptions	CRA	
Service Descriptions	FAA	
Business Definition Documents	NETA Data File Catalogue	X
Business Definition Documents	Interface Design Document - Logica - Part 1	X
Business Definition Documents	Interface Design Document - Logica - Part 2	X
Business Definition Documents	EPFAL IDD	
Business Definition Documents	Reporting Catalogue	X
URSs	BMRA	X
URSs	CDCA	
URSs	CRA	
URSs	ECVAA	
URSs	SAA	X
URSs	TAA	
URSs	FAA	
Software	CDCA	
Software	CRA	
Software	BMRA	X
Software	SAA	X
Software	ECVAA	
Software	FAA	
Other Docs	SAA Operating Procedures	X
Other Docs	CDCA Operating Procedures	
Other Docs	CRA Operating Procedures	
Other Docs	BMRA Operating Procedures	X
Other Docs	ECVAA Operating Procedures	
Other Docs	TAA Operating Procedures	
Other Docs	FAA operating Procedures	
Communication Req Document	Communication Req Document	
Business Process Model	Business Process Model	X
System Specification	BMRA	X

System Specification	CDCA	
System Specification	CRA	
System Specification	ECVAA	
System Specification	SAA	X
Design Specification	BMRA	X
Design Specification	CRA	
Design Specification	CDCA	
Design Specification	ECVAA	
Design Specification	SAA	X
Manaul System Specification	CRA, SAA, ECVAA	
System/Design Spec	FAA	
Requirements Catalogue	TOMAS	X
Design Documents	TOMAS	X
Software	TOMAS	X
LWI	TOMAS	X
Process/Pages	ELEXON Website	X
URS	ELEXON Website	X
Data/Content	ELEXON Website	X
Configuration	Gatekeeper	X
IT Operations Guide	IT Operations Guide	X
Software	MDM	X
Logica Testing Contract	Logica Testing Contract (Ref ?CN0122)	
Logica Test Scripts	Logica Test Scripts	
BSCCo manual procedures	LWIs	
Workarounds	W001	
Workarounds	W006	
Workarounds	W013	
External Dependency	NGC	X
Business Definition Documents	BMRA SAA Interface Specifications – NGC	X
Business Definition Documents	NGC ELEXON Interface Specification	X
	Count of Possible impact	33
	Count of X	33