| NETA Change Form | | ELEXON Reference |
|---|---|---|
| | | P135 |
| **Title** | | **Version No.** |
| Marginal System Buy Price During Periods of Demand Reduction | | 0.1 |
| | | **LogicaCMG Reference** |
| | | ICR532 |
| **Type of Assessment** | **Date CP Received** | **Date IA Issued** |
| HLIA | 26/8/03 | 1/9/03 |

**Brief Summary of Change**

During a 'Period of Demand Reduction' the System Buy Price (SBP) will be calculated differently from normal. This marginal price calculation method will use the most expensive Offer Acceptance remaining in the Net Imbalance Volume.
The calculation of the Marginal System Buy Price can be implemented as a manual solution or as a software solution.

**LogicaCMG's Proposed Solution**

LogicaCMG recommend that a software solution is implemented for P135. A manual workaround has many problems associated with it and a simple software solution can be provided for a similar cost within the required timescales. Of the solutions presented below, all of the Manual options can be implemented for the end of October and the Software options 1a and 1b can be implemented for deployment with the P100 element of the Nov03 release (subject to an order being received by 12th September 2003). Software option 1c is able be implemented, but has a higher risk associated with it due to the extra work involved in the timescales available. Software option 2a cannot be implemented in time and so only an indication of the development effort has been provided in this assessment.

Manual Solutions

For the manual solution there are 4 options:

1a BSCCo calculate and supply marginal SBP. SAA then runs adhoc settlement runs (with no report generation) to determine Buy Price Adjuster (BPA) needed to generate the required marginal SBP. Manually update BPA before proper settlement runs (with report generation) are performed.

1b BSCCo calculate and supply BPA, which is manually updated in SAA before proper settlement runs are performed.

2a BSCCo calculate and supply marginal SBP, System Buy Price Volume Adjustment (SBVA) or System Sell Price Volume Adjuster (SSVA) and any Offers Acceptances to be amended. Manually update SBVA (or SSVA) and price of Offer Acceptances and SAA then runs adhoc settlement runs (with no report generation) to determine BPA needed to generate the required marginal SBP. Manually update BPA before proper settlement runs (with report generation) are performed.

2b BSCCo calculate and supply BPA, System Buy Price Volume Adjustment (SBVA) or System Sell Price Volume Adjuster (SSVA) and any Offers Acceptances to be

amended. Manually update BPA, SBVA (or SSVA) and price of Offer Acceptances before proper settlement runs are performed.

The processes that need to be developed and operated for all these options are described in the 'P135 Manual Processes' document attached.

Notes on Manual Solution

1. The determination of the Marginal SBP is based on the previous Settlement Run. This has obvious implications for the accuracy of the price.
2. The BPA value entered can be overwritten at any time by BSAD data received from the SO in the normal way. The workaround must include steps to verify that this does not happen before the proper Settlement Run is performed. For option 1b this problem could be avoided by contracting the SO to provide the revised BPA value.
3. For options 1a, 2a and 2b the workaround should verify that the price generated by the Settlement Run after BPA adjustment is correct. If it is not, a further iteration may be required before the reports can be released. In previous similar workarounds a tolerance (e.g. within £1) has been applied to allow for any unavoidable inaccuracies.
4. There are a number of factors which could lead to an incorrect determination of the Marginal SBP by TOMAS. Volumes used in the calculation might only need to be out by a small amount to cause the wrong (and potentially significantly different) price to be selected after tagging. There are two main sources of data error which cannot be circumvented in the proposed workarounds:
   a. Data used by TOMAS is from the previous settlement runs. The Transmission Loss Multipliers will change by a small amount between runs. Additionally, care must be taken that Workaround 18 changes are applied correctly in TOMAS as well as SAA
   b. The data reported by SAA (to 3 decimal places) is of a lower accuracy than that used internally in SAA (4 decimal places).
5. The Marginal Prices will not be reflected in BMRA.
6. Solutions 1a and 2a require additional Settlement Runs to be performed for any days where Demand Reduction has been enforced. These additional runs have the potential to impact the ability of the Operational Service to maintain the Settlement Calendar.
7. TOMAS is being used to calculate the final SBP at which all imbalances will be settled. In previous workarounds where TOMAS has been used in this way, it has only been for interim solutions (e.g. P18A). In such cases a system solution has always been developed so that, the RF Settlement Run at least, is based on accurate data. There is an indication in the ELEXON Technical Solution paper that if a workaround is used, then a system solution may never be adopted. If this were the case, then even Final Reconciliation (RF) runs would be performed with potentially inaccurate prices.
8. There are a number of scenarios with all workaround solutions where a negative BPA may be required to give the target marginal SBP.

Software Solutions

For the software solution we are proposing 4 options:

1a SAA calculation change only

1b SAA calculation change with Deemed Demand Control Volume (DDCV) on top of stack

1c SAA calculation change with DDCV (with associated Deemed Demand Control Cost) in the middle of the stack

2a As 1c above plus electronic flow, BMRA calculation changes and SAA reporting

All options except 2a can be implemented for deployment with the Nov03 release (subject to an order being received by 12th September 2003). The changes that need to be developed for all these options are described in 'P135 Software Changes' document attached.

Given the time constraints involved, the proposal is to break the changes into 2 phases which can be developed and delivered separately:

Option 1a, 1b or 1c; this includes any change required to the BSC Systems which allow the Settlement Calculation (SAA only) to comply with the revised rules for P135 and addresses all but point 5 from the notes on manual solution. The software changes for SAA are common code with BMRA, but for BMRA implementation the automatic provision of DC flag and (if needed) Volumes/Costs is also required. Due to time constraints this has not been assessed.

Option 2a; this builds on the Partial Solution to include automated interfaces, full reporting and extends the solution to BMRA.

Two possible variants to the software solution are documented in the ELEXON Technical Solution (version 0.1) [ETS]. These can be summarised as follows from the Settlement Calculation perspective:

Proposed Modification Solution - The calculation is amended to set the SBP to the calculated Margin Price (the highest accepted offer price) rather than the current method during periods of Demand Control.

Alternative Modification Solution - This solution is essentially an extension of the Proposed Solution (above) with two additional requirements:

- Accepted offers pay out at the calculated Margin Price.
- Inclusion of a Deemed Demand Control Volume (DDCV) in the Offer Stack during the price calculation. Within this requirement there are two alternatives to the placing of the DDCV in the Offer Stack:
  - No price associated with DDCV (top of Offer Stack)
  - DDCV has an associated cost (DDCC) allowing a price to be derived and the volume to be placed in the middle of the offer stack.

<u>Notes on the Software solution</u>

1. Where offers are settled at the marginal price what about those offers with PO>SBP? solution (see change to SAA-F007) allows for settling those at the higher offer price instead. There appear to be two alternative to the "pay at margin" methodology as outlined in the URS changes above. One alternative is to pay all offers at the Margin Price, including those with higher Accepted Offer prices, the other is to make the Margin Price the lower limit. The former implies that the calculation of non-delivery

charges would need to change as reducing payment from PO to SBP removes the potential to profit from non-delivery (see SAA-F015 in URS changes).

2. The use of DDCC has a greater impact on the software, so this has been identified as a separate option below.
3. Assume that the marginal price is the highest price remaining on the Offer stack and that BPA is not then applied. Acceptances at that highest price are reported as "setting" the price. Where the price is set by EBVA or DDCV no acceptances will be flagged.
4. Where DDCV is included, Untagged DDCV is computed (c.f. SBVA, USBVA)
5. For BMRA to implement Demand Control rules, an automated flow is required to notify demand reduction invocation to BMRA to be received by end-of-period+5 minutes.
6. For BMRA to include DDCV in the calculation, this must be received by end-of-period+5 minutes.

**Deviation from ELEXON's Solution / Requirements**

None.

**Operational Solution and Impact**

From November 2003 onwards the SAA will be running at full capacity to catch up on Dispute Settlement Runs. Manual options 1a and 2a require additional Settlement Runs to be performed for any days where Demand Reduction has been enforced. These additional runs will inevitably reduce the capacity available for Dispute Settlement runs and have the potential to impact the ability of the Operational Service to maintain the Settlement Calendar.

**Testing Strategy**

| | | | | | |
|---|---|---|---|---|---|
| Unit | ✓ | Change Specific | ✓ | End to End | |
| Module | ✓ | Operational Acceptance | ✓ | Participant Testing | ✓ |
| System | ✓ | Performance | | Parallel Running | |
| Regression | | Volume | | Deployment/ Backout | ✓ |

Other:

It is proposed that the software options 1a, 1b or 1c will be developed as a separate patch to the Nov03 release to be ready for inclusion in the Nov03 OAT and the latter stages of Nov03 end to end testing.

For regression testing, a subset of the Nov03 change-specific test R3A-05 will be run to check that the settlement calculation gives us the same answers in both runs. This would be a post-P78, post-P100 settlement calculation.

**Validated Assumptions**

None.

| **Outstanding Issues** |
|---|
| See the notes on manual and software solutions in the LogicaCMG Proposed Solution section. |

| **Changes to Service** | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Services Impacted** | | | | | | | |
| | BMRA | CDCA | CRA | ECVAA | SAA | TAA | Other |
| Software | | | | | X | | |
| IDD Part 1 (Docs) | X | | | | X | | |
| IDD Part 1 (S'Sheet) | X | | | | X | | |
| IDD Part 2 (Docs) | X | | | | X | | |
| IDD Part 2 (S'Sheet) | X | | | | X | | |
| URS | X | | | | X | | |
| SS | X | | | | X | | |
| DS | X | | | | X | | |
| MSS | | | | | | | |
| OSM | | | | | | | |
| LWIs | | | | | X | | |
| RTP | None | | | | | | |
| Comms | None | | | | | | |
| Other | None | | | | | | |

| **Nature of Documentation Changes** |
|---|
| |

| **Nature / Size of System Changes** |
|---|
| Small |

| | |
|---|---|
| **Type of Release Costed:** | Patch to Nov03 |
| **Deployment Issues, eg Outage Requirements:** | Part of Nov03 outage |
| **Impact on Service Levels:** | See Operational Solution and Impact section |
| **Impact on System Performance:** | See Operational Solution and Impact section |

**Responsibilities of ELEXON**

- URS DCRs are included in this document for software options 1a, 1b or 1c. In order to implement one of these options for the end of October, it is expected that ELEXON will accelerate the document review process.
- Within reasonable levels, ELEXON will make available appropriate staff to assist LogicaCMG during the development of this change.
- ELEXON will provide any text changes required for the BMRA Home Page.

**Acceptance Criteria**

This is assumed to be covered by the acceptance criteria in the "CVA Program – Release Acceptance Criteria" document produced for the Feb03 release.

**Any Other Information**

None.

## Attachments

P135 Manual Processes v0.1
P135 Software Changes v0.1
P135 Price Presentation (Manual) v0.1
P135 Price Presentation (Software) v0.1

## PRICING

**Price Breakdown**

| Item description | Remarks | Price (ex VAT) |
|---|---|---|
| Change Specific | Manual Option 1a | £22,890 |
| | Manual Option 1b | £20,613 |
| | Manual Option 2a | £44,641 |
| | Manual Option 2b | £48,371 |
| | Software Option 1a | £15,445 |
| | Software Option 1b | £22,657 |
| | Software Option 1c | £34,416 |
| Release Cost | Manual Option 1a | £0 |
| | Manual Option 1b | £0 |
| | Manual Option 2a | £0 |
| | Manual Option 2b | £0 |
| | Software Option 1a | £7,824 |
| | Software Option 1b | £7,824 |
| | Software Option 1c | £7,824 |
| **Total Price** | Manual Option 1a | £22,890 |
| | Manual Option 1b | £20,613 |
| | Manual Option 2a | £44,641 |
| | Manual Option 2b | £48,371 |
| | Software Option 1a | £23,269 |
| | Software Option 1b | £30,481 |

| | | |
|---|---|---|
| | Software Option 1c | £42240 |
| **Project Duration** | | Part of Nov03 deployment |
| **Operational Price** | Manual Option 1a<br>Manual Option 1b<br>Manual Option 2a<br>Manual Option 2b<br>Software Option 1a<br>Software Option 1b<br>Software Option 1c | £25,296 per annum plus £20,051 per incident<br>£25,296 per annum plus £20,051 per incident<br>£30,680 per annum plus £46,921 per incident<br>£30,680 per annum plus £57,283 per incident<br>£168 per incident<br>£168 per incident<br>£168 per incident |
| **Rationale** | | |
| See Price Presentations | | |
| **Annual Maintenance Price** | Manual Option 1a<br>Manual Option 1b<br>Manual Option 2a<br>Manual Option 2b<br>Software Option 1a<br>Software Option 1b<br>Software Option 1c | £0<br>£0<br>£0<br>£0<br>£2,162<br>£3,172<br>£4,818 |
| **Rationale** | | |
| The Annual Maintenance Price is derived as 14% of the Change Specific Price of the software changes. | | |
| **Validity Constraints** | | |

- Price and duration for Software Options 1a, 1b, or 1c assume that this change is developed as a patch to the Nov03 deployment
- Price and duration are dependent on an order being received by 12th September 2003.
- No allowance is included in the price for the final solution being different from the URS changes included in this document.
- No allowance is included for supporting PwC activities. Any effort will be charged at contracted T&M rates.
- No allowance is included for supporting ELEXON assurance activities. Any effort will be charged at contracted T&M rates

The offer is based on the following payment schedule:

- LogicaCMG will invoice in full for this change on receipt of Purchase Order or authorised start of work.
- Operate and Maintain charges will be invoiced monthly in arrears with part months charged pro rata.

**Appendix A – Software Solution DCRs**

SAA URS - partial solution

The following is provided for information and is a draft of the changes to the SAA URS (Version 6.0) that would be required to implement the partial software solution. The partial solution is essentially elements that are required to ensure that the calculation (of prices and cashflows) is correct in SAA. The full solution would include additional changes to BMRA and to SAA reports. Details of the software changes are described in a subsequent section.

Note annotations:

[AV] = Proposed Alternate, inclusion of Volume in stack with no price

[AC] = Proposed Alternate, inclusion of Volume in stack where there is also a cost associated with the Volume

[AO] = Proposed Alternate, pay accepted offers at marginal price

**<new> SAA-I033 Demand Control Notification**

manual flow from SO

Demand Control
Settlement Date
Period Range
Settlement Period
Deemed Demand Control Volume [AV, AC]
Deemed Demand Control Cost [AC]

*or [neither AV nor AC]*

First Settlement Period
Last Settlement Period

***5.7 SAA-F007: Calculate balancing mechanism cashflows***

| Requirement ID: | Status: | Title: | ITT reference: |
|---|---|---|---|
| SAA-F007 | M | Calculate balancing mechanism cashflows | SAA SD 3.13, 3.14, 3.15, 3.16, 3.2.1, 3.2.8, SAA BPM 3.7 |
| Man/auto: Automatic | Frequency: Once, on each settlement run. | Volumes: | |
| Functional Requirements:<br><br>A number of intermediate calculations are required to produce the balancing mechanism cashflows. All calculation steps in this requirement are included here. | | | |
| 1: The Period Acceptance Offer Cashflow $CAO^{kn}_{ij}$ shall be calculated as:<br>Where Demand Control is in place and NIV is positive then [AO]<br>$CAO^{kn}_{ij} = QAO^{kn}_{ij} * SBP_j * TLM_{ij}$; *or* | | | |

$CAO^{kn}_{ij} = QAO^{kn}_{ij} * MAX(PO^{n}_{ij}, SBP_j) * TLM_{ij}$

otherwise

$CAO^{kn}_{ij} = QAO^{kn}_{ij} * PO^{n}_{ij} * TLM_{ij}$.

The Period Acceptance Bid Cashflow $CAB^{kn}_{ij}$ shall be calculated as:

$CAB^{kn}_{ij} = QAB^{kn}_{ij} * PB^{n}_{ij} * TLM_{ij}$

Where $QAB^{kn}_{ij}$ is the Period Accepted Bid Volume; $QAO^{kn}_{ij}$ is the Period Accepted Offer Volume; $PB^{n}_{ij}$ is the Bid Price for the corresponding Bid; $PO^{n}_{ij}$ is the Offer Price for the corresponding Offer; and $TLM_{ij}$ is the Transmission Loss Multiplier for BM Unit i and Settlement Period j.

The Period Acceptance Bid Cashflow ($CAB^{kn}_{ij}$) and Period Acceptance Offer Cashflow ($CAO^{kn}_{ij}$) represent the Transmission Loss adjusted cashflow relating to BM Unit I for Balancing Mechanism action in Settlement Period j, allocated to Offer or Bid n, as a result of Bid-Offer Acceptance k. Under normal circumstances, the Period Acceptance Bid Cashflow will be negative as $QAB^{kn}_{ij}$ is negative and $PB^{n}_{ij}$ is normally positive.

The Period Acceptance Bid Cashflow and the Period Acceptance Offer Cashflow need to be stored if required for reporting purposes.

2: The Period BM Unit Offer Cashflow ($CO^{n}_{ij}$) shall be calculated as:

Where Demand Control is in place and NIV is positive then [AO]

$CO^{n}_{ij} = QAO^{n}_{ij} * SBP_j * TLM_{ij}$; *or*

$CO^{n}_{ij} = QAO^{n}_{ij} * MAX(PO^{n}_{ij}, SBP_j) * TLM_{ij}$

otherwise

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

The Period BM Unit Bid Cashflow ($CB^{n}_{ij}$) shall be calculated as:

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

These represent the Transmission Loss adjusted cashflows relating to BM Unit i for Balancing Mechanism action in Settlement Period j, allocated to Offer or Bid n. Under normal circumstances the Period BM Unit Bid Cashflow will be negative.

3: The Period BM Unit Cashflow ($CBM_{ij}$).shall be calculated as:

$CBM_{ij} = \Sigma^{n} CO^{n}_{ij} + \Sigma^{n} CB^{n}_{ij}$

| |
|---|
| This represents the total payment to BM Unit i as a result of accepted Balancing Mechanism action in Settlement Period j |
| 4: The Total System BM Cashflow ($TCBM_j$) shall be calculated as:<br><br>$TCBM_j = \Sigma_i CBM_{ij}$<br><br>This represents the total payments and charges in respect of Balancing Mechanism action for all BM Units (excluding any non-delivery adjustments) in Settlement Period j. |
| Non-Functional Requirement: |
| |
| Interfaces: |
| |
| Issues: |
| |

#### 5.9.2 SAA-F009b: Apply Net Imbalance Volume Tagging

| Requirement ID: | Status: | Title: | ITT reference: |
|---|---|---|---|
| SAA-F009b | M | Apply Net Imbalance Volume Tagging | P78 |
| Man/auto: | Frequency: | Volumes: | |
| Automatic | Once, on each settlement run. | | |
| Functional Requirements: | | | |
| 1: For each settlement period, the offer and bid stacks for all BM units are then updated by applying the following algorithms:<br><br>The Offer (and purchase) stack:<br><br>1. The non-zero (net) Buy Price Volume Adjustment (Energy) ($EBVA_j$) is inserted into the Offer stack in order of price (derived from $EBCA_j/EBVA_j$, i.e. a £/MWh price).<br>2. The non-zero Total System Un-priced Accepted Offer Volume ($TQUAO_j$) is placed at the top of the Offer stack. | | | |

3. The non-zero (net) Buy Price Adjustment (System)($SBVA_j$) is then inserted into the Offer stack below the Total System Un-priced Accepted Offer Volume.
4. The non-zero Deemed Demand Control Volume ($DDCV_j$) is inserted into the Offer stack in order of price (derived from $DDCC_j/DDCV_j$, i.e. a £/MWh price) [AC].
   *or*
   The non-zero Deemed Demand Control Volume ($DDCV_j$) is then inserted into the Offer stack below the (net) Buy Price Adjustment (System) [AV]

For example:

**Offer Stack**

| Offer Type | Price(£/MWh) | Volume (MWh) |
|---|---|---|
| $TQUAO_j$ | - | 10 |
| $SBVA_j$ | - | 0 |
| $DDCV_j$ | - | 2 [AV] |
| $QAPO_j$ | 25 | ~~5~~3 |
| $DDCV_j$ | 22 | 2 [AC] |
| $QAPO_j$ | 20 | 20 |
| $EBVA_j$ | 15 | 5 |
| $QAPO_j$ | 10 | 35 |

The Bid (and sale) stack:

1. The non-zero (net) Sell Price Volume Adjustment (Energy) ($ESVA_j$) is inserted into the Offer stack in order of price (derived from $ESCA_j/ESVA_j$, i.e. a £/MWh price).
2. The non-zero Total System Un-priced Accepted Bid Volume ($TQUAB_j$) is placed at the bottom of the Bid stack.
3. The non-zero (net) Sell Price Adjustment (System)($SSVA_j$) is then inserted into the Bid stack above the Total System Un-priced Accepted Bid Volume.

For example:

**Bid Stack**

| Bid Type | Price(£/MWh) | Volume (MWh) |
|---|---|---|
| $ESVA_j$ | 15 | 15 |
| $QAPB_j$ | 10 | 44 |
| $QAPB_j$ | 5 | 5 |
| $QAPB_j$ | -10 | 7 |
| $SSVA_j$ | - | 25 |
| $TQUAB_j$ | - | 4 |

2: Referencing the remaining offers and bids, and starting from the least expensive bid and most expensive offer, bids and offers are matched and tagged until the smaller (in total volume) of the two stacks is completely tagged.

If, for a particular price, only a subset of the entire set of Bids (or Offers) can be matched, then every Bid (or Offer) in that price is tagged to the same degree (a fraction equal to amount matched, for that price, over the total volume available, for that price), rather than tagging some of the Bids (or Offers) entirely, and others not at all. If the Energy Volume Adjustment is at the same price, then this is treated as if it were another Bid (or Offer) at that same price - i.e. it is partially tagged in the same proportion.

In the example from above the Offer stack is the smaller (having only 70 MWh of total volume, as opposed to 100 MWh on the Bid Stack).The result of this process is that there will be, across the two stacks, a mixture of Tagged and Untagged NIV volumes. Continuing the example:

| Offer Stack | | | | Bid Stack | | | |
|---|---|---|---|---|---|---|---|
| **Tagged Status** | **Offer Type** | **Price** | **Vol** | **Tagged Status** | **Bid Type** | **Price** | **Vol** |
| T | $TQUAO_j$ | - | 10 | U | $ESVA_j$ | 15 | 15 |
| T | $SBVA_j$ | - | 0 | U | $QAPB_j$ | 10 | 15 |
| T | $DDCV_j$ | - | 2 [AV] | T | $QAPB_j$ | 10 | 29 |
| T | $QAPO_j$ | 25 | ~~5~~3 | T | $QAPB_j$ | 5 | 5 |
| T | $DDCV_j$ | 22 | 2 [AC] | T | $QAPB_j$ | -10 | 7 |
| T | $QAPO_j$ | 20 | 20 | T | $SSVA_j$ | - | 25 |
| T | $EBVA_j$ | 15 | 5 | T | $TQUAB_j$ | - | 4 |
| T | $QAPO_j$ | 10 | 30 | | | | |

Note that for the £10 price range only 29 out of the 44 available MWh of Bids at that price can be tagged. Therefore each Bid in that price range would have tagged by an amount equal to 29/44 of their entire volumes. Expanding the example, and assuming that there are three Bids that make up the 44 MWh:

| **Bid Item** | **Volume** | **Tagged Volume** | **Untagged Volume** |
|---|---|---|---|
| 1 | 20 | 20 x 29/44 = 13.182 | 20 x 15/44 = 6.818 |
| 2 | 10 | 10 x 29/44 = 6.591 | 10 x 15/44 = 3.409 |
| 3 | 14 | 14 x 29/44 = 9.227 | 14 x 15/44 = 4.773 |

3. It is now possible to calculate tagged elements of $DDCV_j$[AV, AC] $TQUAB_j$, $ESVA_j$, $SSVA_j$, $TQUAO_j$, $EBVA_j$, and $SBVA_j$ ($TDDCV_j$[AV, AC] $TTQUAB_j$, $TESVA_j$,$TSSVA_j$, $TTQUAO_j$, $TEBVA_j$, $TSBVA_j$ respectively), as well as the untagged elements of $DDCV_j$[AC], $EBCA_j$ and $ESCA_j$ ($UDDCV_j$[AC], $UEBCA_j$ and $UESCA_j$ respectively).

System BSAD (System Buy Price Volume Adjustment ($SBVA_j$) and System Sell Price Volume Adjustment ($SSVA_j$)):

Where none of the system BSAD volume is tagged out by the NIV Tagging, then the NIV Tagged volume is equal to zero (i.e. $TSBVA_j = 0$ or $TSSVA_j = 0$).

Where all of the system BSAD volume is tagged out by the NIV Tagging, then the NIV Tagged volume is equal to the original notified volume (i.e. $TSBVA_j = SBVA_j$ or $TSSVA_j = SSVA_j$).

System (un-priced) Bid – Offer Acceptances (Total System Un-priced Bid Acceptance Volume ($TQUAB_j$) and Total System Un-priced Offer Acceptance Volume ($TQUOB_j$)):

Where none of the (CADL'ed) Un-priced Acceptance volume is tagged out by the NIV Tagging, then the NIV Tagged volume is equal to zero (i.e. $TTQUAB_j = 0$ or $TTQUAO_j = 0$).

Where all of the (CADL'ed) Un-priced Acceptance volume is tagged out by the NIV Tagging, then the NIV Tagged volume is equal to the original calculated volume (i.e. $TTQUAB_j = TQUAB_j$ or $TTQUAO_j = TQUAO_j$).

Deemed Demand Control Volume ($DDCV_j$): [AV]

Where none of the Deemed Demand Control volume is tagged out by the NIV Tagging, then the NIV Tagged volume is equal to zero (i.e. $TDDCV_j = 0$).

Where all of the Deemed Demand Control volume is tagged out by the NIV Tagging, then the NIV Tagged volume is equal to the original notified volume (i.e. $TDDCV_j = DDCV_j$).

Energy BSAD (Energy Buy Price Volume Adjustment ($EBVA_j$) and Energy Sell Price Volume Adjustment ($ESVA_j$)):

Where all of the energy BSAD volume is tagged out by the NIV Tagging, then the NIV Untagged volume is equal to zero (i.e. $UEBVA_j = 0$ or $UESVA_j = 0$). The NIV Untagged price (i.e. $UEBCA_j$ and $UESCA_j$) is also equal to zero.

Where none of the energy BSAD volume is tagged out by the NIV Tagging, then the NIV Untagged volume is equal to the original notified volume (i.e. $UEBVA_j = EBVA_j$ or $UESVA_j = ESVA_j$). The NIV Untagged price (i.e. $UEBCA_j$ and $UESCA_j$) is also equal to the originally notified price.

Where a part of the volume is tagged out by the NIV Tagging, then the price associated with the untagged volume is to be derived as follows:

$UEBCA_j = (EBCA_j / EBVA_j) * UEBVA_j$;

$UESCA_j = (ESCA_j / ESVA_j) * UESVA_j$.

If for that Settlement Period $EBVA_j$ is zero, then $UEBCA_j = 0$;

If for that Settlement Period $ESVA_j$ is zero, then $UESCA_j = 0$.

Deemed Demand Control Volume ($DDCV_j$): [AC]

Where all of the Deemed Demand Control volume is tagged out by the NIV Tagging, then the NIV Untagged volume is equal to zero (i.e. $UDDCV_j = 0$). The Untagged cost (i.e. $UDDCC_j$) is also equal to zero.

Where none of the Deemed Demand Control volume is tagged out by the NIV Tagging, then the NIV Untagged volume is equal to the original notified volume (i.e. $UDDCV_j = DDCV_j$). The NUV Untagged cost (i.e. $UDDCC_j$) is also equal to the originally notified cost.

Where a part of the volume is tagged out by the NIV Tagging then the cost associated with the untagged volume is to be derived as follows:

$$UDDCC_j = (DDCC_j/DDCV_j) * UDDCV_j$$

If for that Settlement Period $DDCV_j$ is zero then $UDDCC_j$ is zero.

4. The Total NIV Tagged Volume for a Settlement Period can now be calculated as:

[AC, AV]

$$TCQ_i = \{\{(\Sigma_i\Sigma^{n'} QAPB^n_{ij}) + TTQUAB_i + TESVA_i + TSSVA_i\} - \{(\Sigma_i\Sigma^{n*} QAPO^n_{ij}) + TTQUAO_i + TEBVA_i + TSBVA_i + TDDCV_i\}\} / 2$$

where

$\Sigma_i$ represents the sum over all BM Units;

$\Sigma^{n'}$ represents the sum over all Priced Acceptance Bids which are NIV Tagged Bids;

$\Sigma^{n*}$ represents the sum over all Priced Acceptance Offers which are NIV Tagged Offers;

$TTQUAB_j$ is the NIV Tagged $TQUAB_j$;

$TESVA_j$ is the NIV Tagged $ESVA_j$;

$TSSVA_j$ is the NIV Tagged $SSVA_j$;

$TTQUAO_j$ is the NIV Tagged $TQUAO_j$;

$TEBVA_j$ is the NIV Tagged $EBVA_j$~~, and~~;

$TSBVA_j$ is the NIV Tagged $SBVA_j$, and

$TDDCV_j$ is the NIV tagged $DDCV_j$.

5. The actual Net Imbalance Volume (NIV) for each Settlement Period can then be calculated as follows:

[AC, AV]

$$NIV_i = \{\Sigma_i\Sigma^n QAPO^n_{ij} + EBVA_i + SBVA_i + TQUAO_i + DDCV_i\} - \{\Sigma_i\Sigma^n (-QAPB^n_{ij}) + (-ESVA_i) + (-SSVA_i) + (-TQUAB_i)\}$$

where

$\Sigma_i$ represents the sum over all BM Units, and;

$\Sigma^n$ represents the sum over all Bid-Offer Pair Numbers for the BM Unit, that are not De Minimis Accepted Bid-Offer Pairs, and not Arbitrage Accepted Bid-Offer Pairs.

6. The remaining offers and bid volumes shall be used in the calculation of the System Buy Price ($SBP_j$) as follows:

In respect of each Settlement Period, if the Net Imbalance Volume is **positive**, and Demand Control has been invoked ($DR_j$ is set) then the System Buy Price will be determined as the highest of:

- any $PO^n_{ij}$ for an accepted Priced Accepted Offers that is not a De Minimis Acceptance volume and not an Arbitrage Accepted Offer and not a NIV Tagged Offer
- $EBCA_j/EBVA_j$ where $UEBVA_j > 0$
- $DDCC_j/DDCV_j$ where $UDDCV_j > 0$ [AC]

If there are no offers meeting these criteria and $UEBVA_j=0$ and $UDDCV_j = 0$ then the System Buy Price will be determined as:

$$SBP_j = \Sigma_s\{PXP_{sj} * QXP_{sj}\} / \Sigma_s QXP_{sj}$$ [1]

where

$\Sigma_s$ represents the sum over all Index Providers;

$PXP_{sj}$ is the Market Index Price for Index Provider s and Settlement Period j;

$QXP_{sj}$ is the Market Index Volume for Index Provider s and Settlement Period j.

If for that Settlement Period $\Sigma_s QXP_{sj}$ is equal to zero, then $SBP_j = 0$ [2].

In respect of each Settlement Period, if the Net Imbalance Volume is **positive**, $DR_j$ is not set and the value of $\{\Sigma_i\Sigma^n \{QAPO^n_{ij} * TLM_{ij}\} + UEBVA_j\}$ is non-zero, then the System Buy Price will be determined as follows:

$$SBP_j = \frac{\{\Sigma_i\Sigma^n\{QAPO^n_{ij} * PO^n_{ij} * TLM_{ij}\} + UEBCA_j\} + \{BPA_j\}}{\{\Sigma_i\Sigma^n \{QAPO^n_{ij} * TLM_{ij}\} + UEBVA_j\}}$$ [3]

where

$\Sigma_i$ represents the sum over all BM Units;

$\Sigma^n$ represents the sum over those accepted Priced Accepted Offers, that are not De Minimis Acceptance volumes and not Arbitrage Accepted Offers and not NIV

[1] Price derivation codes D, K

[2] Price derivation codes E, L

~~1.~~[3] Price derivation codes A, B, C

Tagged Offers;

$PO^n_{ij}$ is the Offer Price for the Offer acceptance n, BM Unit i and Settlement Period j;

$UEBCA_j$ is the NIV Untagged Buy-Price Cost Adjustment (Energy);

$UEBVA_j$ is the NIV Untagged Buy-Price Volume Adjustment (Energy); and

$BPA_j$ is the Buy-Price Price Adjustment.

If, for any Settlement Period, the Net Imbalance Volume is **negative**, then the System Buy Price will be determined as:

$$SBP_j = \Sigma_s\{PXP_{sj} * QXP_{sj}\} / \Sigma_s QXP_{sj}$$ [4]

where

$\Sigma_s$ represents the sum over all Index Providers;

$PXP_{sj}$ is the Market Index Price for Index Provider s and Settlement Period j;

$QXP_{sj}$ is the Market Index Volume for Index Provider s and Settlement Period j.

(a) If for that Settlement Period $\Sigma_s QXP_{sj}$ is equal to zero, then $SBP_j = SSP_j$ [5];
(b) If for that Settlement Period SBP < SSP, i.e. there is a negative spread, then $SBP_j = SSP_j$ [6].

If, for any Settlement Period, the Net Imbalance Volume is **zero**[7], or both $DR_j$ is not set and the value of $\{\Sigma_i\Sigma^n \{QAPO^n_{ij} * TLM_{ij}\} + UEBVA_j\}$ is zero[8], then the System Buy Price will be determined as:

$$SBP_j = \Sigma_s\{PXP_{sj} * QXP_{sj}\} / \Sigma_s QXP_{sj}$$ [9]

where

$\Sigma_s$ represents the sum over all Index Providers;

$PXP_{sj}$ is the Market Index Price for Index Provider s and Settlement Period j;

$QXP_{sj}$ is the Market Index Volume for Index Provider s and Settlement Period j.

If for that Settlement Period $\Sigma_s QXP_{sj}$ is equal to zero, then $SBP_j = 0$ [10].

7. The remaining offers and bid volumes shall be used in the calculation of the System Sell Price ($SSP_j$) as follows:

In respect of each Settlement Period, if the Net Imbalance Volume is **negative**, and the value of $\{\Sigma_i\Sigma^n \{QAPB^n_{ij} * TLM_{ij}\} + UESVA_j\}$ is non-zero, then the System

[4] Price derivation codes F, I

[5] Price derivation codes H, J

[6] Price derivation codes G

[7] Price derivation codes K, L

[8] Price derivation codes D, E

[9] Price derivation codes D, K

[10] Price derivation codes E, L

Sell Price will be determined as follows:

$$SSP_j = \frac{\{\Sigma_i \Sigma^n \{QAPB^n_{ij} * PB^n_{ij} * TLM_{ij}\} + UESCA_j\} + \{SPA_j\}}{\{\Sigma_i \Sigma^n \{QAPB^n_{ij} * TLM_{ij}\} + UESVA_j\}} \quad [11]$$

where

$\Sigma_i$ represents the sum over all BM Units;

$\Sigma^n$ represents the sum over those accepted Priced Accepted Bids, that are not De Minimis Acceptance volumes and not Arbitrage Accepted Bids and not NIV Tagged Bids;

$PB^n_{ij}$ is the Bid Price for the Bid acceptance n, BM Unit I and Settlement Period j:

$UESCA_j$ is the NIV Untagged Sell-Price Cost Adjustment (Energy):

$UESVA_j$ is the NIV Untagged Sell-Price Volume Adjustment (Energy); and

$SPA_j$ is the Sell-Price Price Adjustment.

If for any Settlement Period the Net Imbalance Volume is **positive**, then the System Sell Price will be determined as follows:

$$SSP_j = \Sigma_s\{PXP_{sj} * QXP_{sj}\} / \Sigma_s QXP_{sj} \quad [12]$$

where

$\Sigma_s$ represents the sum over all Index Providers;

$PXP_{sj}$ is the Market Index Price for Index Provider s and Settlement Period j;

$QXP_{sj}$ is the Market Index Volume for Index Provider s and Settlement Period j.

(a) If for that Settlement Period $\Sigma_s QXP_{sj}$ is equal to zero, then $SSP_j = SBP_j$ [13].
(b) If for that Settlement Period SSP > SBP, i.e. there is a negative spread, then $SSP_j = SBP_j$ [14].

If for any Settlement Period the Net Imbalance Volume is **zero**[15], or the value of $\{\Sigma_i \Sigma^n \{QAPB^n_{ij} * TLM_{ij}\} + UESVA_j\}$ is zero[16], then the System Sell Price will be determined as:

$$SSP_j = \Sigma_s\{PXP_{sj} * QXP_{sj}\} / \Sigma_s QXP_{sj} \quad [17]$$

where

$\Sigma_s$ represents the sum over all Index Providers;

$PXP_{sj}$ is the Market Index Price for Index Provider s and Settlement Period j;

$QXP_{sj}$ is the Market Index Volume for Index Provider s and Settlement Period j.

If for that Settlement Period $\Sigma_s QXP_{sj}$ is equal to zero, then $SSP_j = 0$ [18].

[11] Price derivation codes F, G, H

[12] Price derivation codes A, D

[13] Price derivation codes C, E

[14] Price derivation codes B

[15] Price derivation codes K, L

8: In respect of each Settlement Period, the Total Priced Volume of Offers will be determined as follows:

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

where

$\Sigma_i$ represents the sum over all BM Units;
$\Sigma^n$ represents the sum over those accepted Offers that are not De Minimis Acceptance volumes and not Arbitrage Accepted Offers and not NIV Tagged Offers;

In respect of each Settlement Period then the Total Priced Volume of Bids will be determined as follows:

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

where

$\Sigma_i$ represents the sum over all BM Units;

$\Sigma^n$ represents the sum over those accepted Bids that are not De Minimis Acceptance volumes and not Arbitrage Accepted Bids and not NIV Tagged Bids;

9. The price adjustment parameters shall be set through the automatic interface SAA-I026, as directed by SO. Note that if no adjustment data has been provided for Settlement Period j then a value of zero will be used for all eight parameters.

The system parameters like Arbitrage Flag, $DMAT_d$, and $CADL_d$ are received from BSCC Ltd through the manual flow SAA-I023.

Market Index Data is received from Market Index Data Providers through the automatic flow SAA-I030.

The SAA shall, for the purposes of performance reporting, record details of those cases where:

1. A value of zero was used for Market Index Price and Volume are used for a Settlement Period, for the purposes of the Initial Interim Settlement Calculation
2. A Market Index Provider has failed to supply Market Index Data for any given Settlement Period, such that a default price and volume of zero are used for that Settlement Period, for the purposes of the Initial Interim Settlement Calculation.

The SAA shall for the purposes of reporting, record a Price Derivation Code ($PDC_i$)

[16] Price derivation codes I, J

[17] Price derivation codes I, K

[18] Price derivation codes J, L

| |
|---|
| for each Settlement Period. This code will describe how the SBP and SSP were calculated. The possible values for the code, and their associated meaning, are defined in Appendix E. |
| Non-Functional Requirement: |
| |

***5.15 SAA-F015: Calculate non-delivery charges***

| Requirement ID: | Status: | Title: | ITT reference: |
|---|---|---|---|
| SAA-F015 | M | Calculate non-delivery charges | SAA SD 3.43, 3.44, 3.45, 3.46, SAA BPM 3.14, SAA WK1 Action 30 |
| Man/auto: Automatic | Frequency: Once, on each settlement run. | Volumes: | |
| Functional Requirement: | | | |
| A number of intermediate calculations are required to produce the non delivery charges. All calculation steps in this requirement are included here. | | | |
| 1: The Non-Delivered Offer Charge ($CNDO^n_{ij}$) shall be calculated for the non-delivery of Offer n in Settlement Period j from BM Unit i, as follows:<br><br>If Demand Control is in force ($DR_j$ set) and NIV is positive ($NIV_j > 0$) then<br>$CNDO^n_{ij} = 0$<br>*[AO: only needed for case where all offers paid at SBP since in that case PO > SBP but only paid at SBP so the potential profit from non delivery is zero; where offers paid at MAX(SBP, PO) then non delivery charges only appear where paid at above SBP which is the case now anyway]*<br>otherwise<br>$CNDO^n_{ij} = QNDO^n_{ij} * Max \{(PO^n_{ij} – SBP_j), 0\} * TLM_{ij}$<br><br>Where $SBP_j$ is the System Buy Price, $PO^n_{ij}$ is the Offer Price and $TLM_{ij}$ is the Transmission Loss Multiplier for that BM Unit and Settlement Period. | | | |
| 1: The Non-Delivered Offer Charge ($CNDO^n_{ij}$) shall be calculated for the non-delivery of Offer n in Settlement Period j from BM Unit i, as follows: | | | |

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

Where $SBP_j$ is the System Buy Price, $PO^{n}_{ij}$ is the Offer Price and $TLM_{ij}$ is the Transmission Loss Multiplier for that BM Unit and Settlement Period.

2: The Non-Delivered Bid Charge ($CNDB^{n}_{ij}$) shall be calculated for the non-delivery of Bid n in Settlement Period j from BM Unit i, as follows:

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

Where $SSP_j$ is the System Sell Price, $PB^{n}_{ij}$ is the Bid Price and $TLM_{ij}$ is the Transmission Loss Multiplier for that BM Unit and Settlement Period.

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

2: The Non-Delivered Bid Charge ($CNDB^{n}_{ij}$) shall be calculated for the non-delivery of Bid n in Settlement Period j from BM Unit i, as follows:

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

Where $SSP_j$ is the System Sell Price, $PB^{n}_{ij}$ is the Bid Price and $TLM_{ij}$ is the Transmission Loss Multiplier for that BM Unit and Settlement Period.

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

3: The BM Unit Period Non-Delivery Charge ($CND_{ij}$).shall be calculated for the non-delivery of Bids and Offers in Settlement Period j from BM Unit i, as follows:

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

4: The Total System Non-Delivery Charge ($TCND_j$) shall be calculated for the non-delivery of Bids and Offers in Settlement Period j, summed across all BM Units, as follows:

$TCND_{j} = \Sigma_{i} CND_{ij}$

**Manual Solutions**

## Option 1a

| Step | When | Action |
|---|---|---|
| 1 | Working days, continuous | Monitor for and be available to receive notification of new periods of demand reduction being invoked |
| 2 | When notified of demand reduction | Determine from the settlement calendar the dates of all runs for the settlement date. Record the Settlement Date and periods affected together with settlement run dates. |
| 3 | At the same time as 2 | Notify IMServ that demand reduction will apply for the particular settlement dates. Agree that the additional Ad-Hoc run can be accommodated on the dates required. |
| 4 | As required | Assist ELEXON as required with provision of data for TOMAS as requested. |
| 5 | For each demand reduction date | Ensure that the SAA Settlement run is run (by IMServ) in advance of the release date in the Settlement Calendar (as soon as possible after the CDCA run has been completed). Run MUST NOT be released |
| 6 | For each demand reduction date and run type (i.e. 6 times for each demand control incident) and for EACH settlement period affected | Extract the SBP calculated in the Ad-Hoc settlement run. Determine the difference between this price and the price quoted on the ELEXON website. This is the amount which needs to be added to the BPA to give the "correct" price. Determine what the BPA should now be. |
| 7 | After step 6 | Instruct IMServ to change the BPA to the new value. Check that this has been implemented. Ensure all periods affected by demand reduction have had the BPA updated if required |
| 8 | After step 7 | Agree with IMServ that the settlement run can now take place. Output should NOT be released |
| 9 | After step 8 | Extract the SBP obtained from the settlement run performed in 8 and check that it matches that on the ELEXON website. Discuss results of check with ELEXON Service Delivery. |
| 10 | After 9 | Authorise IMServ to release the NEW settlement run. Record all details in P135 tracking spreadsheet. |

| Step | When | Action |
|---|---|---|
| 11 | Between settlement runs | Provide requested assistance to ELEXON re changes to data between run types, price queries etc. |
| 12 | Between settlement runs | Respond to participant queries regarding BSAD data being used in settlement which differs from that on BMRA, very high SBP etc (estimate 10 queries of 2 hours each per demand control incident) |

**Option 1b**

| Step | When | Action |
|---|---|---|
| 1 | Working days, continuous | Monitor for and be available to receive notification of new periods of demand reduction being invoked |
| 2 | When notified of demand reduction | Determine from the settlement calendar the dates of all runs for the settlement date. Record the Settlement Date and periods affected together with settlement run dates. |
| 3 | At the same time as 2 | Notify IMServ that demand reduction will apply for the particular settlement dates. Agree that the additional Ad-Hoc run can be accommodated on the dates required. |
| 4 | As required | Assist ELEXON as required with provision of data for TOMAS as requested. |
| 5 | For each settlement date and period affected (prior to each settlement run) | Receive BPA adjustment from ELEXON. Ensure BPA adjustment has been received from ELEXON for all periods affected by demand control. |
| 6 | After step 5 | Instruct IMServ to change the BPA to the new value. Check that this has been implemented |
| 7 | After step 6 | Agree with IMServ that the settlement run can now take place. Output should NOT be released |
| 8 | After step 7 | Extract the SBP obtained from the settlement run performed in 8 and check that it matches that on the ELEXON website. Discuss results of check with ELEXON Service Delivery. |
| 9 | After step 8 | Authorise IMServ to release the NEW settlement run. Record all details in P135 tracking spreadsheet. |
| 10 | Between settlement runs | Provide requested assistance to ELEXON re changes to data between run types, price queries etc. |
| 11 | Between settlement runs | Respond to participant queries regarding BSAD data being used in settlement which |

| Step | When | Action |
|---|---|---|
| | | differs from that on BMRA, very high SBP etc (estimate 10 queries of 2 hours each per demand control incident) |

**Option 2a**

| Step | When | Action |
|---|---|---|
| 1 | Working days, continuous | Monitor for and be available to receive notification of new periods of demand reduction being invoked |
| 2 | When notified of demand reduction | Determine from the settlement calendar the dates of all runs for the settlement date. Record the Settlement Date and periods affected together with settlement run dates. |
| 3 | At the same time as 2 | Notify IMServ that demand reduction will apply for the particular settlement dates. Agree that the additional Ad-Hoc run can be accommodated on the dates required. |
| 4 | As required | Assist ELEXON as required with provision of data for TOMAS as requested. |
| 5 | For each demand reduction date and run type (i.e. 6 times for each demand control incident) | Receive from ELEXON details of all BM Units for which they believe Offers were accepted during the demand control period together with the marginal price to be applied as the offer price for these BM Units |
| 6 | At same time as step 5 | Confirm that no other BM Units had offers accepted during the period of demand control (script required). Advise ELEXON Service Delivery immediately if any discrepancies are identified and await their further instruction |
| 7 | After step 6 | Instruct IMServ to change all the offer prices (ie all positive bid-offer pairs) for all the BM Units identified as affected for the settlement periods of demand control |
| 8 | After step 7 | On receiving confirmation from IMServ that all offer prices have been updated run script to check this has been done. |
| 9 | For each demand reduction date and run type (i.e. 6 times for each demand control incident) | Receive revised values of SBVA (SSVA) from ELEXON for each settlement period affected by demand control. Ensure revised values have been received for each period affected by Demand control |
| 10 | After step 9 | Instruct IMServ to enter revised SBVA/ SSVA values |
| 11 | After step 10 | IMServ to confirm values of SBVA/ SSVA have been entered. Check the values entered |

| Step | When | Action |
|---|---|---|
| | | are correct |
| 12 | For each demand reduction date | Ensure that the SAA Settlement run is run (by IMServ) in advance of the release date in the Settlement Calendar (as soon as possible after the CDCA run has been completed). Run MUST NOT be released |
| 13 | On completion of step 12 and for EACH run type and settlement period affected | Extract the SBP calculated in the Ad-Hoc settlement run. Determine the difference between this price and the price quoted on the ELEXON website. This is the amount which needs to be added to the BPA to give the "correct" price. Determine what the BPA should now be. |
| 14 | After step 13 | Instruct IMServ to change the BPA to the new value. Check that this has been implemented. Ensure all periods affected by demand reduction have had the BPA updated if required |
| 15 | After step 14 | Agree with IMServ that the settlement run can now take place. Output should NOT be released |
| 16 | After step 15 | Extract the SBP obtained from the settlement run performed in 13 and check that it matches that on the ELEXON website. Discuss results of check with ELEXON Service Delivery. |
| 17 | As required | Provision for a second Ad-Hoc run to be run |
| 18 | After step 17 | Authorise IMServ to release the NEW settlement run. Record all details in P135 tracking spreadsheet. |
| 19 | Between settlement runs | Provide requested assistance to ELEXON re changes to data between run types, price queries etc. |
| 20 | Between settlement runs | Respond to participant queries regarding BSAD data being used in settlement which differs from that on BMRA, very high SBP etc (estimate 10 queries of 2 hours each per demand control incident) |
| 21 | When ANY W018 received | Validate whether W018 falls within period of demand control. If it does ensure ELEXON are aware of this and seek authorisation to amend the offer prices for this BM Unit for the periods affected and make changes to SAA. |
| 22 | When any Manifest Error correction received | Validate whether for a Demand Control period and reject back to ELEXON as invalid if the Manifest error is for an accepted offer during a demand control period |

**SOFTWARE / SYSTEM SOLUTIONS**

**Option 1a – SAA Calculation Change Only**

| Item | Change |
|---|---|
| 1 | New manual flow from the SO to SAA that Demand Control has been invoked. Flow contents need to be sufficient to determine which Settlement Periods are affected. Use Dated Parameter to hold flag |
| 2 | SAA-F009 - where demand control is invoked and NIV > 0, SBP computation becomes select MAX price from untagged, non-arbitraged, non-DMAT priced accepted offers rather than selecting Average price |

**Option 1b - SAA calculation change with Deemed Demand Control Volume (DDCV) on top of stack**

| Item | Change |
|---|---|
| 1 | New manual flow from the SO to SAA that Demand Control has been invoked. Flow contents need to be sufficient to determine which Settlement Periods are affected. Use Dated Parameter to hold flag. Additional inclusion of Deemed Demand Control Volume (and, if appropriate, Deemed Demand Control Cost) in above flow |
| 2 | SAA-F009 - where demand control is invoked and NIV > 0, SBP computation becomes select MAX price from untagged, non-arbitraged, non-DMAT priced accepted offers rather than selecting Average price |
| 3 | SAA-F007: where demand control is invoked and NIV > 0, compute $CO^{n}_{ij} = QAO^{n}_{ij} * SBP_{j} * TLM_{ij}$; *or* $CO^{n}_{ij} = QAOnij * MAX(PO^{n}_{ij}, SBP_{j}) * TLM_{ij}$ |
| 4 | SAA-F015: where demand control is invoked and NIV > 0 $CO^{n}_{ij} = QAO^{n}_{ij} * SBP_{j} * TLM_{ij}$; Then $CNDO^{n}_{ij} = 0$ |
| 5 | Include DDCV in offer stack at the top, along with Unpriced offer volume and SSVA |

**Option 1c - SAA calculation change with DDCV (with associated Deemed Demand Control Cost) in the middle of the stack**

| Item | Change |
|---|---|
| 1 | New manual flow from the SO to SAA that Demand Control has been invoked. Flow contents need to be sufficient to determine which Settlement Periods are affected. Use Dated Parameter to hold flag. Additional inclusion of Deemed Demand Control Volume (and, if appropriate, Deemed Demand Control Cost) in above flow |
| 2 | SAA-F009 - where demand control is invoked and NIV > 0, SBP computation becomes select MAX price from untagged, non-arbitraged, non-DMAT priced accepted offers rather than selecting Average price |
| 3 | SAA-F007: where demand control is invoked and NIV > 0, compute $CO^{n}_{ij} = QAO^{n}_{ij} * SBP_{j} * TLM_{ij}$; *or* $CO^{n}_{ij} = QAOnij * MAX(PO^{n}_{ij}, SBP_{j}) * TLM_{ij}$ |
| 4 | SAA-F015: where demand control is invoked and NIV > 0 $CO^{n}_{ij} = QAO^{n}_{ij} * SBP_{j} * TLM_{ij}$; Then $CNDO^{n}_{ij} = 0$ |

| Item | Change |
|---|---|
| 5 | Include DDCV within the offer stack at price derived from DDCC/DDCV in same manner as for EBCA & EBVA |

**Option 2a - As Option 1c plus BMRA calculation changes and SAA reporting**

| Item | Change |
|---|---|
| 1 | New electronic flow from the SO to BMRA and SAA that Demand Control has been invoked. Flow contents need to be sufficient to determine which Settlement Periods are affected. Additional inclusion of Deemed Demand Control Volume (and, if appropriate, Deemed Demand Control Cost) in above flow |
| 2 | SAA-F009 - where demand control is invoked and NIV > 0, SBP computation becomes select MAX price from untagged, non-arbitraged, non-DMAT priced accepted offers rather than selecting Average price |
| 3 | SAA-F007: where demand control is invoked and NIV > 0, compute $CO^{n}_{ij} = QAO^{n}_{ij} * SBP_{j} * TLM_{ij}$; *or* $CO^{n}_{ij} = QAOnij * MAX(PO^{n}_{ij}, SBP_{j}) * TLM_{ij}$ |
| 4 | SAA-F015: where demand control is invoked and NIV > 0 $CO^{n}_{ij} = QAO^{n}_{ij} * SBP_{j} * TLM_{ij}$; Then $CNDO^{n}_{ij} = 0$ |
| 5 | Include DDCV within the offer stack at price derived from DDCC/DDCV in same manner as for EBCA & EBVA |
| 6 | Introduce new Price Derivation Codes to reflect potential new cases:<br>NIV positive, Demand Control in force<br>M - SBP = marginal price; SSP = Market price<br>N - SBP = marginal price; SSP capped to SBP<br>O - SBP = marginal price; SSP defaulted to SBP<br>P - SBP defaulted to SSP; SSP = Market price<br>Q - SBP & SSP defaulted to zero<br><br>where DDCV is included in the NIV stack, the derivation under all rules is affected and so would merit new codes.<br><br>As an alternative, consider append a second character to each code to indicate Demand Control rules apply, so for example<br>A = no Demand Control, as now and<br>AD = Demand Control so marginal<br>F = no Demand Control, as now and<br>FD = Demand Control so NIV includes DDCV thus reducing volume remaining on bid stack and potentially increasing SSP etc. |
| 7 | New Demand Control flag (Boolean), DDCV, UDDCV, DDCC and UDDCC in SAA-I014 |
| 8 | Construct System Message from Demand Control notification and publish using existing mechanism and existing web page |
| 9 | New "marginal flag" for acceptances in SAA-I014 |
| 10 | Set "marginal flag" for all acceptances which have $PO^{n}_{ij}$=MAX from select (i.e. before BPA applied) |