Modification Proposal – BSCP40/03	MP No: P305 *(mandatory by BSCCo)*

Title of Modification Proposal *(mandatory by originator)*

Electricity Balancing Significant Code Review Developments

Submission Date *(mandatory by originator)*

30 May 2014

Description of Proposed Modification *(mandatory by originator)*

This Modification Proposal is submitted in order to fulfil the requirement of the direction to National Grid Electricity Transmission plc (NGET) by the Authority to raise modifications arising from the Electricity Balancing Significant Code Review (EBSCR) process.

In line with that direction, there are four main elements making up this proposal:

- Reduction in the Price Average Reference (PAR) volume and Replacement PAR (RPAR) volume
- Changing from dual to single cash-out pricing
- Changing how reserve actions are priced into cash-out using a Reserve Scarcity Pricing (RSP) function
- Pricing demand control actions into cash-out at the Value of Lost Load

The Authority is seeking implementation of this proposal ahead of winter 2015/16, and strongly urges the industry to progress and complete the modification process in time to allow for this.

The specific proposals that follow are expected to facilitate and not preclude any further consideration of the relevant issues and / or development of different approaches that may better achieve the purposes and objectives of this proposal as required by the terms set out in the Authority's direction.

A detailed description of the aforementioned four main elements follows.

Reduction in PAR

Parallel to this modification, a separate BSC Modification Proposal has been raised to reduce the PAR volume from 500MWh to 250MWh by November 2014. This proposal seeks to set out phased timescales for a further reductions in the PAR and RPAR volumes (as defined in the BSC) as follows[1]:

- Reduce PAR volume from 250MWh to 50MWh by November 2015
- Reduce RPAR volume from 100MWh to 1MWh by November 2015
- Reduce PAR volume from 50MWh to 1MWh by November 2018

A single cash-out price per Settlement Period

Under the existing cash-out price arrangements, if a market participant's imbalance is in the opposite

[1] Under the Directions issued by the Authority to NGET, consideration is requested as to whether indicative values for new PAR volumes may be published ahead of implementation to assist parties to adjust to the new arrangements. This is being progressed outside by Elexon the modification process.

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direction to that of the Transmission System, that party will be settled using the reverse energy imbalance price. This modification proposes to settle all parties on a single imbalance price for a given Settlement Period calculated from the main pricing method. Parties will pay or receive the main price depending on their imbalance position and the reverse pricing methodology will no longer be used in the settlement of imbalance positions[2].

Subject to the other changes presented in this modification, the existing System Buy Price (SBP) and System Sell Price (SSP) main price calculations will continue to be used to derive the imbalance price. The Transmission System imbalance (the Net Imbalance Volume (NIV)) will determine whether the main pricing method is based on the SBP or SSP calculations, as follows:

- If the NIV is negative, the Energy Imbalance Price will be determined according to the existing Main Pricing methodology for calculating the System Sell Price, with the SBP being set equal to the SSP;
- If the NIV is positive, the Energy Imbalance Price will be determined according to the existing Main Pricing methodology for calculating the System Buy Price, with the SSP being set equal to the SBP;
- The Workgroup will need to consider on what provisions should be made in the BSC for the basis of determining the Energy Imbalance Price when the NIV is equal to zero.
    - Potential solutions which the Workgroup may wish to consider include: setting the System Buy Price equal to zero; setting the System Buy Price equal to the existing Market Price (as defined in the BSC); or setting the System Buy Price equal to the Credit Assessment Price or an alternative market reference price. The System Sell Price shall be set equal to the System Buy Price.

Reserve pricing

This proposal seeks to implement a new methodology for pricing reserve into the calculation of the imbalance price. For Settlement Periods when Balancing Mechanism (BM) and non-BM (NBM) Short Term Operating Reserve (STOR) actions are taken, an associated price will be entered into the cash-out calculation using the Reserve Scarcity Pricing (RSP) function methodology. This will operate as follows:

- For each Settlement Period, an 'RSP price' will be produced that reflects the value of reserve to the system.
- Each STOR[3] action that is accepted in that Settlement Period will be entered into the imbalance calculation at a price which is the greater of the action's utilisation price and the RSP price. That action will be treated consistently with other buy actions and subject to normal flagging and tagging rules.
- The calculation of the Buy Price Adjuster (BPA) shall be revised to remove the inclusion of reserve availability payments (components of which are referred to in the Balancing Services Adjustment Data (BSAD) Methodology Statement as 'option fees' for STOR and firm regulating reserve).
- For each Settlement Period, the RSP price shall be calculated as a product of the Value of Lost

[2] The Workgroup will consider whether it is appropriate to retain the Market Index Price when the reverse price is retired.

[3] Or firm regulating reserve action if taken.

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Load (VoLL) price multiplied by the Loss of Load Probability (LOLP).

- For each Settlement Period, NGET shall produce a LOLP using information available at Gate Closure. The LOLP shall be calculated and published as soon as practicable after Gate Closure and in time for the indicative cash-out price published within 15 minutes of the end of the Settlement Period.
- For each Settlement Period, NGET shall produce and publish a number of indicative LOLPs ahead of Gate Closure, the frequency and timing of which shall be agreed by the Workgroup.
- Provisions will be made, under the BSC, for a 'LOLP calculation methodology' which will set out the calculations to be followed by NGET to produce the LOLP and indicative LOLPs. The methodology statement will be governed, reviewed and consulted upon by the BSC Panel and subject to the approval of the Authority.
    - The input variables to the LOLP shall be dynamically calculated based on the latest available system information. A non-exhaustive list of input metrics to the LOLP is provided in Section 3.4 of the EBSCR Business Rules[4].
    - A key input to the LOLP is the measure of 'margin' (or available capacity). The margin shall include available BM and NBM STOR. The margin shall exclude emergency actions and provisionally exclude Supplemental Balancing Reserve (SBR) and Demand Side Balancing Reserve (DSBR) services (providing doing so is consistent with how these services are priced into cash-out[5]). The margin shall take into account the reserve for response[6], which is withheld by NGET to mitigate the risk that a single large unit failure causes widespread disconnection.

Pricing Demand Control Actions

Under this proposal, demand control actions shall enter the cash-out price calculation at an administrative value, the VoLL price.

The Demand Control actions to be assigned the VoLL price shall:

- Include demand reduction instructed by NGET (including System Operator (SO) instructed voltage reduction) and manual demand disconnection instructed by NGET;
- Include automatic Low Frequency Demand Disconnection (LFDD) if the Workgroup determine that to be appropriate (giving appropriate consideration to the issues set out in Appendix 3 of the EBSCR Final Policy Decision[7]);
- Be treated as System Buy Actions for the purposes of incorporation into the cash-out price calculation, subject to the same flagging, tagging and classification rules as accepted balancing actions.

[4] https://www.ofgem.gov.uk/ofgem-publications/87789/electricitybalancingsignificantcodereview-draftbusinessrules.pdf

[5] Issue 56 'Treatment of the new SBR and DSBR services in the imbalance price' has been raised to discuss how SBR and DSBR services might be incorporated into the cash-out price calculation. Subject to these discussions a separate modification may be raised to progress a solution.

[6] The reserve for response value is subtracted from the margin to ensure that at the point where margin reduces to that level (of reserve) the RSP price reaches the VoLL.

[7] https://www.ofgem.gov.uk/ofgem-publications/87782/electricitybalancingsignificantcodereview-finalpolicydecision.pdf

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The VoLL price shall:

- On its introduction be set at £3,000/MWh, and will increase to £6,000/MWh by November 2018;
- At any time, there shall only ever be a single value applied to those Demand Control actions that will be priced into cash-out;
- Be governed by standard BSC Code Modification procedures under Section F (of the BSC). In addition to this, a provision will be included to allow the Authority to direct changes to the VoLL price.

A 'top-down' approach shall be employed for applying the VoLL price to demand control actions for the purposes of producing the indicative system imbalance prices and the initial cash-out price calculation (for the Interim Information (II) run). Such that:

- The commencement and cessation of the demand control action will be notified by NGET. The details within the notification will be considered by the Workgroup but may contain: a MW estimate of the total level of demand control instructed to the Licensed Distribution System Operator(s) (LDSOs); a System Management Action Flagging (SMAF) flag where appropriate; and which LDSOs have been impacted by the incident.
- An associated volume for the demand control action is derived (by the Settlement Administration Agent) using data submitted by NGET. The conversion of data will apply the principles set out in BSC Section T3.
- The procedures for the 'top-down' approach will be consistent with those outlined in Section 4.2 of the EBSCR Business Rules. The Workgroup will consider whether a more accurate procedure can be used for calculating the imbalance price in the II run.

A 'bottom-up' approach, using more accurate volume estimates, shall be employed for the purposes of calculating the cash-out price for relevant demand control actions for the Initial Settlement (SF) and subsequent Settlement Runs, and for adjusting supplier imbalance volumes for those runs, such that:

- An accurate estimate for the volume of disconnected demand will be created using consumption and registration details of each MPAN. Separate processes will be used for estimating volume for meters that are Half Hourly (HH) and Non-Half Hourly (NHH).
- The procedures for the 'bottom up' approach (to estimate volume of demand control and adjust supplier imbalance volumes) will be consistent with those outlined in Sections 4.3 – 4.8 and 4.9(b) - 4.9(e) of the EBSCR Business Rules. The Workgroup will determine the extent to which these procedures can be applied to voltage reduction and where feasible will do so.
- For the purposes of calculating the system prices for the SF and further Settlement Runs, for each Settlement Period, the total demand disconnection impact will be determined by summing the (GSP Group Corrected) HH and NHH impacts as determined in 4.7(b) of the EBSCR Business Rules.
- Should the Workgroup fail to identify a bottom-up methodology for estimating the voltage reduction volume, then the SO's initial estimate of demand reduction accruing to voltage reduction will be used to inform SF and later cash-out prices (as well as earlier runs), consistent with Ofgem's policy intent to include a cost for Demand Control actions into cash-

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out prices. In the event that demand disconnection actions are taken simultaneously to voltage reduction actions, the Workgroup may consider whether it is feasible[8] to price voltage reduction into SF and later cash-out runs and where feasible will do so.

- Consideration will be given as to whether the bottom-up approach can be applied to earlier cash-out runs such as the II run.
- The Workgroup will determine the extent to which bottom-up procedures can and should be applied to account for Low Frequency Demand Disconnection in SF and later cash-out price runs and in correction of supplier imbalance volumes.
- Irrespective of how a Demand Control action is classified (in terms of flagging and tagging), if an associated 'bottom-up' volume estimate for that action is available then it should be used to correct supplier imbalance volumes.

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

The existing cash-out arrangements do not currently provide efficient signals as prices do not accurately reflect costs to consumers or the value they place on maintaining supplies. As a result the balancing and investment decisions of market participants are not aligned to the interests of consumers. In particular, dampened signals when system margins are tight send insufficient signals about the value to consumers of flexible capacity. Therefore the current arrangements have undermined the efficiency of signals for incentives for: the dispatch and utilisation of flexible generation and Demand Side Response (DSR); imports during tight margins via interconnectors; investment in flexible generation; Suppliers to offer Time of Use tariffs to customers; innovation in flexible technologies (e.g. storage).

A number of inefficiencies in the current cash-out pricing methodology have been identified in the EBSCR. The EBSCR Final Policy Decision sets out a package of reforms to the existing cash-out price arrangements designed to improve the efficiency of imbalance price signals to the market.

PAR Level

The first inefficiency relates to the level of PAR. PAR is the maximum volume over which the weighted average of the most expensive energy actions (to the SO) are taken. This is currently set at 500MWh. Deriving a weighted average from a volume of 500MWh creates an imbalance price which does not reflect the marginal cost of balancing energy for a given Settlement Period. This may lead to parties overlooking balancing opportunities available before Gate Closure which are cheaper than actions available to the SO. This is especially material during very tight margins when differences between the costs of accepted balancing actions are greatest. Therefore this modification (along with a separate BSC Modification Proposal raised for implementation in November 2014) proposes to reduce the PAR volume in the steps set out above.

[8] For this purpose, 'feasible' means: (a) the solution will accurately estimate the demand reduction associated with voltage reduction; (b) assessment indicates the likely impact on the cash-out price of accounting for the effect of voltage reduction in the presence of demand disconnection is non-negligible and therefore proportionate to the effort required.

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Reserve Pricing

In its role as SO, responsible for maintaining a secure and balanced system, NGET enters into contracts for reserve services that will provide additional power sources to be able to deal with unforeseen increases in demand and/or generation unavailability during times when the margins are very tight. The main source of reserve is STOR, which is contracted from providers in advance of delivery. Capacity availability is procured at a pre-agreed utilisation price in return for availability payments. Since utilisation prices for BM STOR are determined in advance they will not be reflective of the value that the capacity provides to the market at times of scarcity. Furthermore, the current method for incorporating availability payments for BM and NBM STOR into cash-out is through the BPA which applies an uplift to cash-out prices according to a pre-determined profile that does not reflect the level of tightness on the system for a given Settlement Period.

As such a new methodology, RSP pricing, is proposed to ensure that when a reserve action is taken, the price assigned to that action captures the value that that capacity is providing to the system at times of margin tightness. Furthermore, the arbitrary uplift applied to the System Buy Price as a result of the BPA will be removed.

Pricing Demand Control

Demand control measures are available to the SO to secure a balanced system when there is insufficient power on the system to meet demand. Under current arrangements, if NGET instruct the LDSO(s) to reduce demand (through demand disconnection or voltage reduction), there is no feed into the calculation of the cash-out price to capture the value to the system of that action. That is, market participants will not face any cost attributable to that which is imposed on the impacted consumers. By assigning a VoLL price to demand control actions and treating them in the same manner as balancing actions, the incentives on market participants to maintain balanced positions at times of system scarcity are strengthened.

Single Cash-out Prices

Under the existing dual pricing arrangements, any party that has an imbalance position for a Settlement Period that is in the opposite direction to the system's imbalance will be exposed to a 'reverse price'. The reverse price is calculated to approximate the market price parties might have received had they traded their imbalance position ahead of Gate Closure. Thereby, the reverse price ensures parties will not benefit from a more favourable price for their imbalance position than available in the market. However imbalance positions that effectively help to reduce imbalance on the Transmission System will mean that fewer balancing actions are required to be taken by the SO. The reverse price is therefore not cost-reflective as it does not reflect the costs the SO has avoided as a result of imbalances in the opposite direction to the system imbalance. Efficient cash-out signals require that parties that provide opposing imbalance positions (to that of the system) gain the full benefit their opposing imbalances deliver. Moving to single cash-out arrangements removes the existing inefficient price spread and should have the effect of reducing the net imbalance costs faced by parties depending on the frequency at which they have opposing imbalances.

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Impact on Code *(optional by originator)*

BSC Section Q – Balancing Mechanism Activities
BSC Section T – Settlement and Trading Charges

Impact on Core Industry Documents or System Operator-Transmission Owner Code *(optional by originator)*

Potential amendments required to other core documents, resulting from the changes in this Modification Proposal, have been identified as, but are not limited to:

- Balancing Services Adjustment Data (BSAD) Methodology (Transmission Licence Condition C16 Statement) – amendment to the BPA calculation
- System Management Action Flagging (SMAF) Methodology (Transmission Licence Condition C16 Statement)
- Grid Code OC6 – pending any changes to the arrangements for Demand Control instructions and/or notifications (system warnings)
- Market Index Definition Statement (under BSC Section T) – pending the Workgroup's proposed treatment of the Market Price following a move to single pricing.
- Connection and Use of System Code (CUSC) - should the Market Price be discontinued following a move to single pricing, new arrangements will be required to replace cross-references from the CUSC to the BSC Market Price (Section 11, definition for Interruption Payment; and Section 4.1.3.9A Balancing Services, payment for formulae for Response Energy Payments).

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

To be determined.

Impact on other Configurable Items (*optional by originator)*

To be determined.

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

Submitted in order to fulfil the requirement of the direction to NGET by the Authority with respect to raising modifications arising from the EBSCR process.

The proposed modification would better facilitate Applicable BSC Objectives (b) and (c):

> *(b) The efficient, economic and co-ordinated operation of the National Electricity Transmission System*

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The proposed changes to the cash-out price calculation make prices more reflective of the value to consumers of balancing, particularly during times of very tight margins. In doing so, market participants will be incentivised to make more efficient balancing and investment decisions. This should result in reductions in the total costs (to the SO and market) of maintaining a balanced system, whilst presenting savings on the costs of delivering secure electricity supplies in the future.

Making cash-out prices sharper signals the commencement of reforms designed to better reflect the value of flexible plant in the balancing arrangements. It may therefore contribute to deferring the mothballing of flexible plant and help counteract potential tightening of margins.

The stepped nature of implementation should allow time for industry to adjust to the EBSCR reforms and to change behaviours accordingly.

> *(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*

Reflecting the value that actions deliver supports effective competition by aligning competitive incentives of market participants with the interests of the consumer. The reforms eliminate distortions in the arrangements that currently impede value reflectivity, thereby supporting effective competition that drives value for the consumer.

Strengthening the energy imbalance price signal, through PAR reform, reserve scarcity pricing and introducing pricing for demand control, should incentivise market participants to trade to balance their positions ahead of Gate Closure. This should increase liquidity in the forward market and benefit competition by encouraging investment in flexible capacity (flexible generation, demand participation and other technologies).

The inclusion of a single imbalance price removes the existing inefficient price spread and for many market participants, in particular smaller parties who are less likely to drive the system length. This should reduce net imbalance costs and therefore help to mitigate the potential imbalance risk faced by market participants.

These reforms may alter the incentives for parties to enter the market. The reforms address existing inefficiencies which limit the potential for some parties, in particular those offering services that facilitate flexibility and balance (such as DSR or storage), to participate in the wholesale electricity market.

Is there a likely material environmental impact? *(optional by originator)*

No

Urgency Recommended: No *(delete as appropriate) (optional by originator)*

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Justification for Urgency Recommendation *(mandatory by originator if recommending progression as an Urgent Modification Proposal)*

N/A

Self-Governance Recommended: No *(delete as appropriate) (optional by originator)*

Justification for Self-Governance Recommendation *(mandatory by originator if recommending progression as Self-Governance Modification Proposal)*

N/A

Fast Track Self-Governance Recommended: No *(delete as appropriate) (optional by originator)*

Justification for Fast Track Self-Governance Recommendation *(mandatory by originator if recommending progression as Fast Track Self-Governance Modification Proposal)*

N/A

Should this Modification Proposal be considered exempt from any ongoing Significant Code Reviews? *(optional by originator in order to assist the Panel decide whether a Modification Proposal should undergo a SCR Suitability Assessment)*

No ongoing SCRs (this proposed modification is consequential to the EBSCR)

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Attachments: No *(delete as appropriate) (mandatory by originator)*

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

N/A