## 4.7 Issue Form

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| **Issue Form - BSCP40/04** | **Issue Number: 71***(mandatory by BSCCo)* |
| **Issue Title** Introduction of a baselining methodology as an alternative to Physical Notifications |
| **Issue Description** *(Mandatory by originator)*Modification Proposal [P344 ‘Project TERRE implementation into GB market arrangements’](https://www.elexon.co.uk/mod-proposal/p344/) seeks to align the Balancing and Settlement Code (BSC) with the European Balancing Project TERRE (Trans European Replacement Reserves Exchange) requirements. A final Ofgem decision is expected by 31 July 2018.**Existing BM Settlement arrangements and TERRE** The P344 solution is intended to facilitate participation in the Balancing Mechanism (BM) and TERRE by a wider range of industry market participants, including customers and independent aggregators. It is envisaged that the existing BM Settlement arrangements will remain unchanged. Under the BM, National Grid can issue MW profile instructions to a BM Unit to deviate from a MW baseline. Balancing Service providers that want to participate in the BM must indicate at what mega-watt (MW) level they expect their BM Unit to be at for any given Settlement Period. This is known in the Grid Code as a Physical Notification (PN). At Gate Closure this MW level is finalised and sent to Settlement where it is termed the BM Unit’s Final Physical Notification (FPN) and acts as a baseline for any future deviation instructions from National Grid. For each instruction received, Settlement calculates Offer or Bid Acceptance Volumes based on the difference between the instruction and the baseline. BM participants are settled (i.e. paid or must pay) on the basis of these volumes. A Replacement Reserve (RR) Instruction will work similar to normal BM instructions; with National Grid issuing an instruction sent to the control point of an RR accepted BM Unit to deviate from their current committed level. P344 Workgroup members noted that the requirement to provide a Physical Notification (ahead of Gate Closure) may be problematic for customers and independent aggregators, where the asset they control (and whose output they can forecast accurately) may share a network connection with other Demand or Generation whose output is outside of their control. In this situation, the expertise for new market entrants lies in calculating the cumulative change for the customer’s sites but not the cumulative change relative to total Demand for those customer sites.Inaccurate PN’s may lead to customers not being paid fully for delivery even if they had responded as requested, which will deter them from offering their services or pricing in this risk thus increasing cost. Where a site has demand which fluctuates and is not static or predictable this further compounds the problem. **Justification for Examining Issue** (Mandatory by originator)The EB GL requires that Transmission System Operators (TSOs) facilitate demand response participation in TERRE, including independent aggregation facilities and energy storage. Ofgem defines independent aggregators as Parties who bundle changes in consumers’ loads or distributed generation output for sale in organised markets and who do not simultaneously supply the customer with energy.P344 as it currently stands facilitates the participation of Independent Aggregators in RR by creating Virtual Lead Parties.However, there is a potential that the aforementioned issues could create a barrier to entry to certain customer sites and hence, the participation of Demand Response in RR may not be optimised. P344 must be implemented in a manner to allow the implementation of Project TERRE to meet the go-live deadline of December 2019 and Modification legal text Implementation Date of February 2019. Therefore, the ‘Behind the Meter’ issue is being discussed separately to P344. The issues noted require careful consideration to maintain a level playing field and facilitate market competition.This Issue will work alongside the ‘Settlement of Secondary BM Units using metering at the asset’ Issue group.Resolving these issues would better facilitate the following Applicable BSC Objectives:**(b) The efficient, economic and co-ordinated operation of the national electricity transmission system; as by improving objective** Removing a barrier to entry for Independent Aggregators to the provision of RR will increases the options available to National Grid when balancing the System, thus leading to more efficient and economic balancing actions being procured.  **(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**Encouraging increased participation within the market enhances Applicable BSC Objective (c) but only if this is achieved not at the expense of other providers. Therefore, careful consideration of the potential solutions is required.**(e) Compliance with the Electricity Regulation and any relevant legally binding decision of the European Commission and/or the Agency [for the Co-operation of Energy Regulators]** By better facilitating participation in TERRE of Independent Aggregators, Applicable BSC Objective (e) is better facilitated. |
| **Potential Solution**Where the Lead Party of a BM Unit has elected to use the solution, they would still submit a Physical Notification to the Transmission Company (in accordance with the Grid Code) for dispatch purposes; but this Physical Notification would no longer be used in Settlement to determine the Non-Delivery Volume. BSC Systems would instead calculate a baseline (in accordance with a baseline methodology), which would be used to determine whether the BM Unit had delivered the required acceptance.**Dispatch**The Transmission Company would (as currently) dispatch a BM Unit by issuing a Bid Offer Acceptance (BOA) or RR Instruction (RRI) constructed with reference to the Physical Notification submitted by the Lead Party. The nature of this PN is a matter for the Grid Code rather than the BSC, but because this solution decouples the PN from the Non-Delivery calculation, it may be appropriate for Lead Parties to submit a different type of PN compared to current arrangements:* They could submit a PN that reflects the expected output only of the actual assets (demand or generation) delivering the response, not the site as a whole.
* Alternatively, it might be appropriate for them to submit a zero PN, in which case the BOA or RRI issued by the Transmission Company would become a ‘delta’ instruction (rather than an instruction to an absolute MW level)

Regardless of how the PN is constructed, National Grid would send the Final Physical Notification (FPN) to Balancing Mechanism Reporting Agent (BMRA) and Settlement Administration Agent (SAA) as currently (for use in calculating the Bid Offer Volume). As National Grid already receives accurate FPN’s for the System through the Primary BM Units providing a delta instruction for a Secondary BM Unit should not negatively impact forecasting of Demand and Balancing of the System.**Settlement**For Settlement purposes, for those BM Units for which the Lead Party has elected to use the solution, BSC Central Systems could construct a Baseline Volume (from historic metered data) for each Settlement Period. This baseline volume could be used (instead of the Final Physical Notification) to calculate the Period Expected Metered Volume (QMEij), and hence the Non-Delivery Volumes. Calculating baselines for Settlement after the event should further increase the accuracy of the baseline values when compared to the values used for dispatch, as a different metering data set could be used i.e. wait until Settlement Final (SF) data is available before Settlement.This solution recognises that the FPN for dispatch will be different from the FPN used for Settlement purposes and will therefore require changes to industry systems. The Issue group will need to consider whether or not various Industry Parties, require accurate PN’s relating to Secondary BM Units for dispatch purposes. Arguably the Transmission Company is more concerned about the delta and whether the delta has been delivered or not, but the current system for dispatch and Settlement requires an accurate starting position. If a PN value of zero is used, the solution will be restricted to those BM Units which do not need to submit PN’s currently under the Grid Code. The Transmission Company requires BM Units to submit PNs if their Generation or Demand Capacity is at or above 50MW in England and Wales, 30MW in South Scotland or 10MW in North Scotland. A Lead Party could however register a Secondary BM Unit and then submit a PN value of 0 for that Secondary BM Unit.is the Issue Group should also consider whether this solution could be extended to other Balancing Services, other than RR, such as for example BM Short Term Operating Reserve (STOR), and Non BM STOR via the Virtual Lead Party and Secondary BM Unit route, and; could Baselining be used by Industry participants to set their PN’s for Primary BM Units which require PN’s, irrespective of whether they intend to submit a BOA.**Baselining Methodologies**There are numerous potential baselining methodologies for the Issue group to consider, each with their own merits. We initially recommend as a starting point a baseline methodology which uses the previous 10 day’s Settlement Periods. Following reviews of baselines used in various American markets which have mature Demand Response services this was seen as the most successful. Setting a baseline value for dispatch potentially rules out methodologies which require metering data for the previous 10 days due to the Settlement values, or if this methodology is used there must be acceptance that the Demand data which is used to set the baseline is unverified and potentially less accurate.Baselining 10 day methodologyMetering data is used to establish a customer baseline load. Baseline is then established using “10 in 10” methodology which is a Simple average of 10 similar non-event days using most recent days prior to an “event”.This methodology is currently in use in the California Independent System Operator (ISO) and is now mature<http://www.caiso.com/Documents/DemandResponseUserGuide.pdf>However it is under constant review through a baseline accuracy workgroup set up to review the accuracy of baselines<https://www.caiso.com/Documents/2017BaselineAccuracyWorkGroupFinalProposalNexant.pdf>Below is a detailed example of the baseline calculation process (source: <http://olivineinc.com/wp-content/uploads/2017/02/PDF_DemandResponseOIR-2013_Report_PGE_20171011-Public.pdf>). Studies have shown this to be the most successful of baselines.* Identify the target number of previous similar day‐type non‐event days
* Day‐types are defined as weekdays (Monday – Friday) and weekends/public holidays
* The target number of days for each day‐type are:
	+ - Weekdays: 10 days
		- Weekends/holidays: 4 days
* Previous event days are excluded
* The maximum look‐back window is 45 days
* If 10 non‐event “Weekdays” cannot be identified within the 45‐day look‐back window, but at least 5 days can be identified, the baseline is calculated using the available days
* If at least 5 non‐event Weekdays or 4 non‐event Weekends/holidays cannot be identified in the look‐back window, the highest usage prior event days within the look‐back window are then included as needed to reach the minimum number of days

An event day is a day with weather or market conditions which would likely lead to energy curtailment or provision.On the day adjustments are applied to the baseline to take into account weather and could include for example likelihood of it being a Triad, other pricing signals (i.e. when you move into winter and ­­­-­pricing encourages less demand), load before use etc. Variances on this baseline methodology include using the top 5 days as an average of the last 10 non –event days. All baseline methodologies are improved by using on the day adjustments.It is worth noting that all baselines failed to accurately forecast baselines for highly variable loads, which is where work in conjunction with the behind the meter Issue may complement this issue or potentially negate the need for baselines. |
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