

Modification Group Memo:

SSMG ISSUE 7

Analysis of impact on Energy Imbalance Prices

This memo outlines the results of analysis of the potential impact of the Issue 7 anomaly on Energy Imbalance Prices for a selection of affected Settlement Periods. This analysis was conducted by ELEXON at the request of the SSMG.

It should be noted that there are two (main) caveats that apply to the analysis undertaken that should be considered when reviewing / assessing the results:

1. As noted below, there is currently no way of determining the re-declaration time associated with Maximum Export Limit (MEL) re-declarations. Therefore, given that the issue is highly timing dependent (see the Requirements Specification (reference 041RBR, V1.1, 18 May 2004) for details) it is possible that genuine occurrences of the issue have been excluded, and that erroneous instances have been included. It is also impossible to say by what proportion; and
2. It is also impossible to determine whether MEL has been re-declared more than once, and therefore whether the Acceptance volumes are being calculated with reference to the 'correct' MEL.

Therefore, this analysis should not be interpreted as a definitive assessment of the materiality of Issue 7 in respect of the implications on the Energy Imbalance Prices, rather it should be interpreted as an indicative guide to the potential materiality.

1. Process Followed

- Settlement Periods from 20 March 2004 to 12 April 2004 were considered;
- For this time period (1150 Settlement Periods¹), potential occurrences of the anomaly were identified for BM Units where the Settlement Period Maximum Export Level (MEL) was lower than the Settlement Period Final Physical Notification (FPN), and where an Acceptance had been instructed on the BM Unit.

This approach makes no allowance for the timing of the MEL submission and will typically over estimate the number of affected Settlement Periods (noting that it is impossible to quantify the magnitude of any over or under estimation);

- For all the Settlement Periods identified as potentially affected the Energy Imbalance Prices were recalculated on the basis of Acceptance Volumes derived in relation to MEL for the relevant BM Unit;
- Cases where one (or both) of the Energy Imbalance Prices (System Sell and / or System Buy) had changed by £0.24 or more were identified for further manual investigation;
- These cases were considered individually (via (manual) reference to BMRA data, see Annex 1) in order to identify whether or not an apparently genuine occurrence of the anomaly exists. This judgement was based on the following criteria:
 - MEL is less than FPN throughout the Settlement Period;
 - The Acceptance points correspond to the MEL. This is assumed to indicate that the BM Unit was operating at MEL prior to the Acceptance instruction, thus implying the MEL re-declaration was issued prior to the Acceptance.

¹ 23 days with 48 Settlement Periods and 1 day with 46 Settlement Periods.

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In the absence of MEL submission information, these criteria have been used to identify cases where maximum confidence can be taken that the occurrence of the anomaly is genuine. Therefore, it should not be assumed that cases that do not meet these criteria are not genuine occurrences.

2. Results

- In the period from the 20 March 2004 to the 12 April 2004 (comprising 1150 Settlement Periods) the number of Settlement Periods flagged as potentially affected were **279** (24.3% of the total Settlement Periods).

It should be noted that the 24.3% figure is derived from comparing MEL and FPN for BM Units on which Acceptances were taken where MEL is below FPN across the whole Settlement Period, and this approach is caveated above.

- Of these 279 Settlement Periods, recalculation of the Energy Imbalance Prices indicated a change of +/- £0.24 or more in **21** cases (7.5% of the 279 Settlement Periods, and 1.8% of the total number of Settlement Periods (1150)).
- From these 21 cases, all were manually investigated using BMRA, and **4** have been identified as genuine occurrences of the anomaly (noting the caveat above that other cases may also be genuine occurrences).
- The following table outlines the analysis of the price impact in these 4 cases.

| Date | SP | BMU Affected | Original SBP | Original SSP | Revised SBP (change) | Revised SSP (change) |
|-----------|----|--------------|--------------|--------------|----------------------|----------------------|
| 21-Mar-04 | 45 | T_MEDP-1 | £19.13 | £-20.63 | £19.13 (0) | -£14.78 (28%) |
| 22-Mar-04 | 47 | T_WBUPS-4 | £15.42 | £14.62 | £15.00 (3%) | £15.00 (2.6%) |
| 29-Mar-04 | 48 | T_FIDL-2 | £16.87 | £13.39 | £16.87 (0) | £13.63 (1.8%) |
| 01-Apr-04 | 28 | T_DRAXX-6 | £28.63 | £13.60 | £28.63 (0) | £14.49 (6.5%) |

The attached spreadsheet gives the detail of the Energy Imbalance Price changes for all 279 Settlement Periods, with those 21 Settlement Periods where the change is in excess of 24 pence (and therefore manually investigated) shaded.

For the avoidance of doubt and as caveated above, these 279 instances have NOT been verified as genuine instances of the anomaly. It is probable that genuine occurrences of the anomaly have been excluded from this total, and that, more probably, erroneous instances have been included. It is also impossible to say by what proportion.

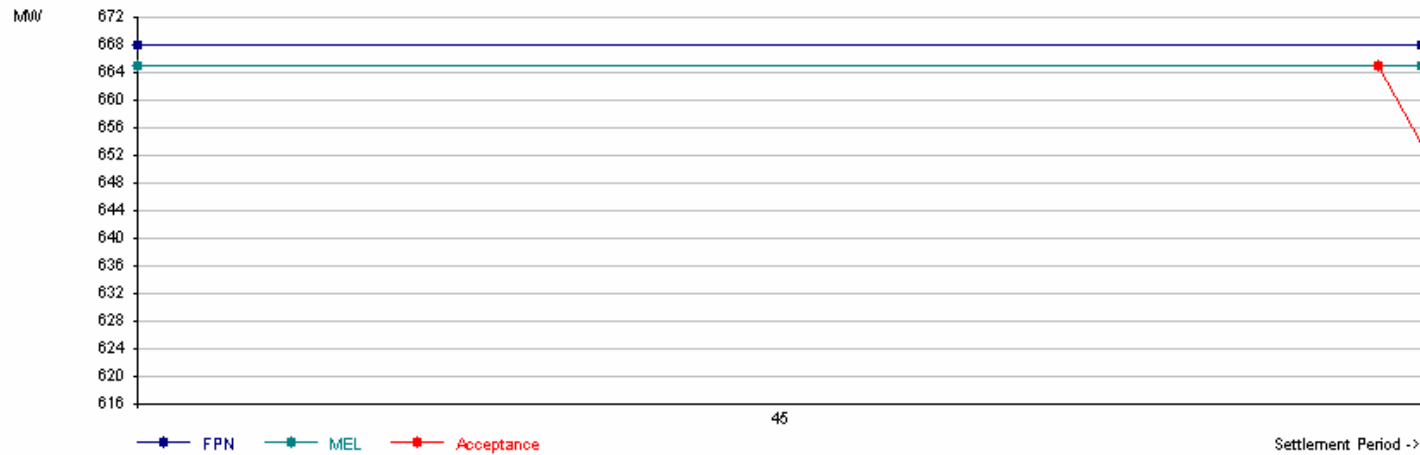
Furthermore, the proposed change in the Energy Imbalance Prices has been derived on the basis of all Acceptances on the BM Unit in question being made in relation to the re-declared MEL, and therefore this may not be correct. Again it is impossible to determine the extent of any inaccuracy arising from this aspect.

The data has been provided for information only and is subject to all of the caveats set out above. Therefore, to re-iterate, the data should not be relied on as a definitive assessment of the materiality of Issue 7 in respect of the implications on the Energy Imbalance Prices, rather it should be interpreted as an indicative guide to the potential materiality.

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ANNEX 1: BMRA EXTRACTS FOR EXAMPLES

T_MEDP-1 Settlement Day (yyyy-mm-dd) 2004-03-21 Period: 45



FPN Data

| Sett Period | From Time (GMT) | From Level | To Time(GMT) | To Level |
|---------------------------------------|------------------|------------|------------------|----------|
| T_MEDP-1, T, Medway Power Ltd, MEDP-1 | | | | |
| 45 | 2004-03-21 22:00 | 668.000 | 2004-03-21 22:30 | 668.000 |

QPN Data

| Sett Period | From Time (GMT) | From Level | To Time(GMT) | To Level |
|---------------------------------------|------------------|------------|------------------|----------|
| T_MEDP-1, T, Medway Power Ltd, MEDP-1 | | | | |
| 45 | 2004-03-21 22:00 | 0.000 | 2004-03-21 22:30 | 0.000 |

Maximum Export Limit

| Sett Period | From Time (GMT) | From Level | To Time(GMT) | To Level |
|---------------------------------------|------------------|------------|------------------|----------|
| T_MEDP-1, T, Medway Power Ltd, MEDP-1 | | | | |
| 45 | 2004-03-21 22:00 | 665.000 | 2004-03-21 22:30 | 665.000 |

Maximum Import Limit

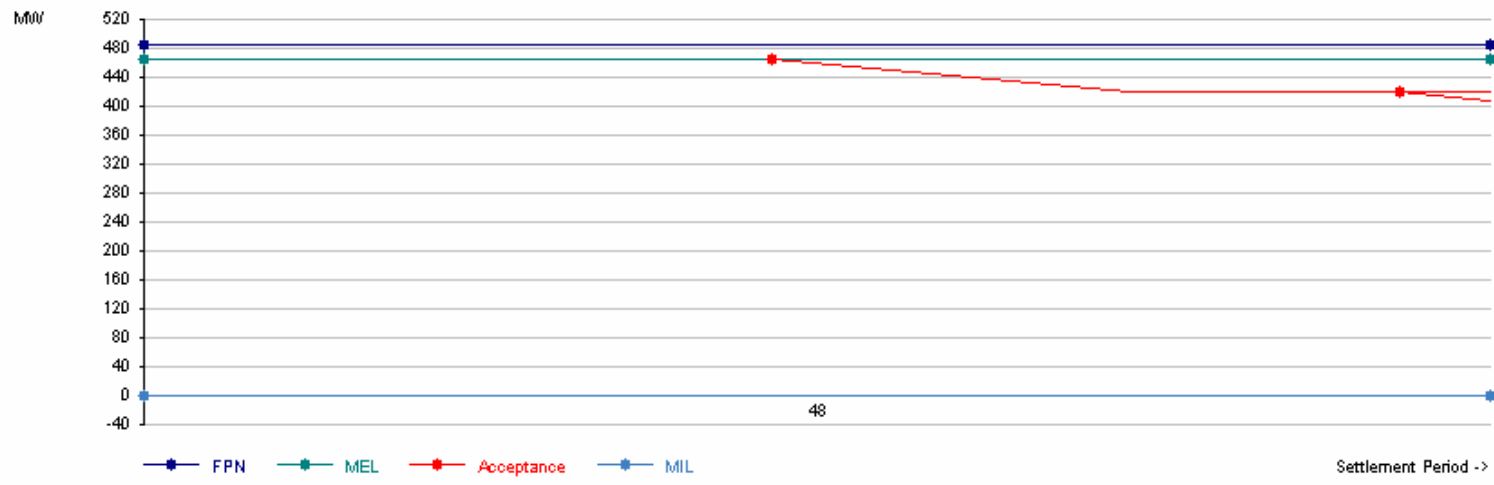
| Sett Period | From Time (GMT) | From Level | To Time(GMT) | To Level |
|---------------------------------------|------------------|------------|------------------|----------|
| T_MEDP-1, T, Medway Power Ltd, MEDP-1 | | | | |
| 45 | 2004-03-21 22:00 | -20.000 | 2004-03-21 22:30 | -20.000 |

Bid-Offer Acceptance Level Data

| Acceptance Id | Acceptance Time | Deemed Flag | From Time (GMT) | From Level | To Time (GMT) | To Level |
|---------------------------------------|------------------|-------------|------------------|------------|------------------|----------|
| T_MEDP-1, T, Medway Power Ltd, MEDP-1 | | | | | | |
| 5659 | 2004-03-21 22:27 | N | 2004-03-21 22:29 | 665.000 | 2004-03-21 22:33 | 620.000 |

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T_FIDL-2 Settlement Day (yyy-mm-dd) 2004-03-29 Period: 48



FPN Data

| Sett Period | From Time (GMT) | From Level | To Time(GMT) | To Level |
|--|------------------|------------|------------------|----------|
| T_FIDL-2, T, AEPES UK Generation Limited, FIDL-2 | | | | |
| 48 | 2004-03-29 22:30 | 485.000 | 2004-03-29 23:00 | 485.000 |

QPN Data

| Sett Period | From Time (GMT) | From Level | To Time(GMT) | To Level |
|--|------------------|------------|------------------|----------|
| T_FIDL-2, T, AEPES UK Generation Limited, FIDL-2 | | | | |
| 48 | 2004-03-29 22:30 | 0.000 | 2004-03-29 23:00 | 0.000 |

Maximum Export Limit

| Sett Period | From Time (GMT) | From Level | To Time(GMT) | To Level |
|--|------------------|------------|------------------|----------|
| T_FIDL-2, T, AEPES UK Generation Limited, FIDL-2 | | | | |
| 48 | 2004-03-29 22:30 | 465.000 | 2004-03-29 23:00 | 465.000 |

Maximum Import Limit

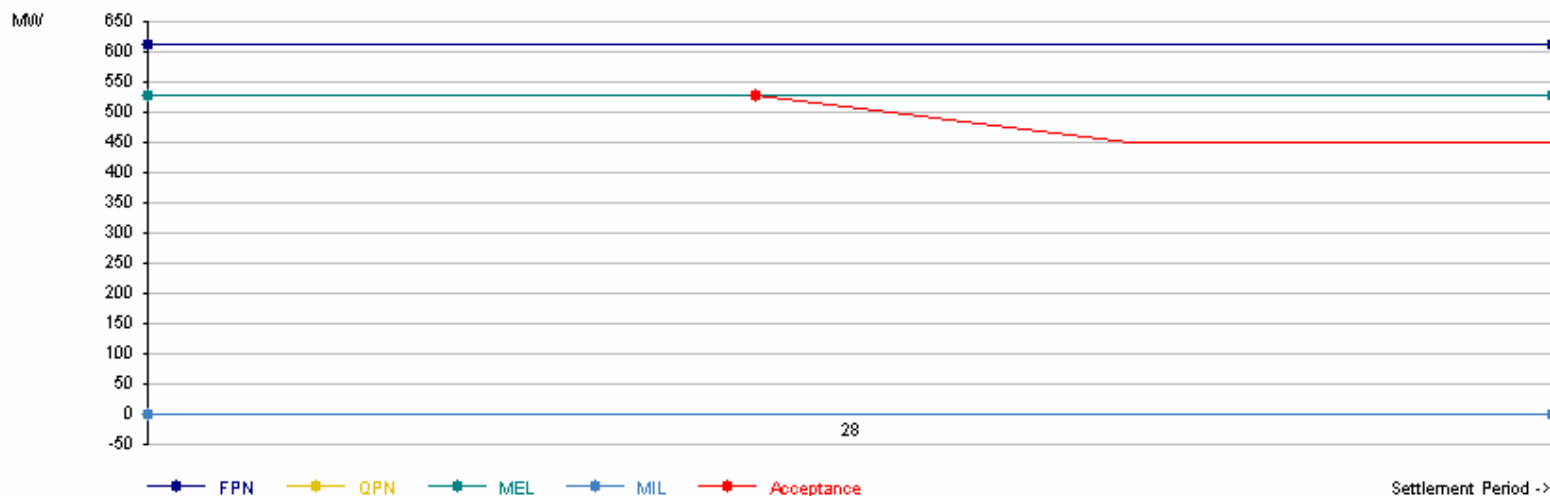
| Sett Period | From Time (GMT) | From Level | To Time(GMT) | To Level |
|--|------------------|------------|------------------|----------|
| T_FIDL-2, T, AEPES UK Generation Limited, FIDL-2 | | | | |
| 48 | 2004-03-29 22:30 | 0.000 | 2004-03-29 23:00 | 0.000 |

Bid-Offer Acceptance Level Data

| Acceptance Id | Acceptance Time | Deemed Flag | From Time (GMT) | From Level | To Time (GMT) | To Level |
|--|------------------|-------------|------------------|------------|------------------|----------|
| T_FIDL-2, T, AEPES UK Generation Limited, FIDL-2 | | | | | | |
| 4054 | 2004-03-29 22:42 | N | 2004-03-29 22:44 | 465.000 | 2004-03-29 22:52 | 420.000 |
| 4054 | 2004-03-29 22:42 | N | 2004-03-29 22:52 | 420.000 | 2004-03-29 23:22 | 420.000 |
| 4055 | 2004-03-29 22:56 | N | 2004-03-29 22:58 | 420.000 | 2004-03-29 23:07 | 370.000 |

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T_DRAXX-6 Settlement Day (yyyy-mm-dd) 2004-04-01 Period: 28



FPN Data

| Sett Period | From Time (GMT) | From Level | To Time(GMT) | To Level |
|-------------|------------------|------------|------------------|----------|
| 28 | 2004-04-01 12:30 | 615.000 | 2004-04-01 13:00 | 615.000 |

QPN Data

| Sett Period | From Time (GMT) | From Level | To Time(GMT) | To Level |
|-------------|------------------|------------|------------------|----------|
| 28 | 2004-04-01 12:30 | 0.000 | 2004-04-01 13:00 | 0.000 |

Maximum Export Limit

| Sett Period | From Time (GMT) | From Level | To Time(GMT) | To Level |
|-------------|------------------|------------|------------------|----------|
| 28 | 2004-04-01 12:30 | 530.000 | 2004-04-01 13:00 | 530.000 |

Maximum Import Limit

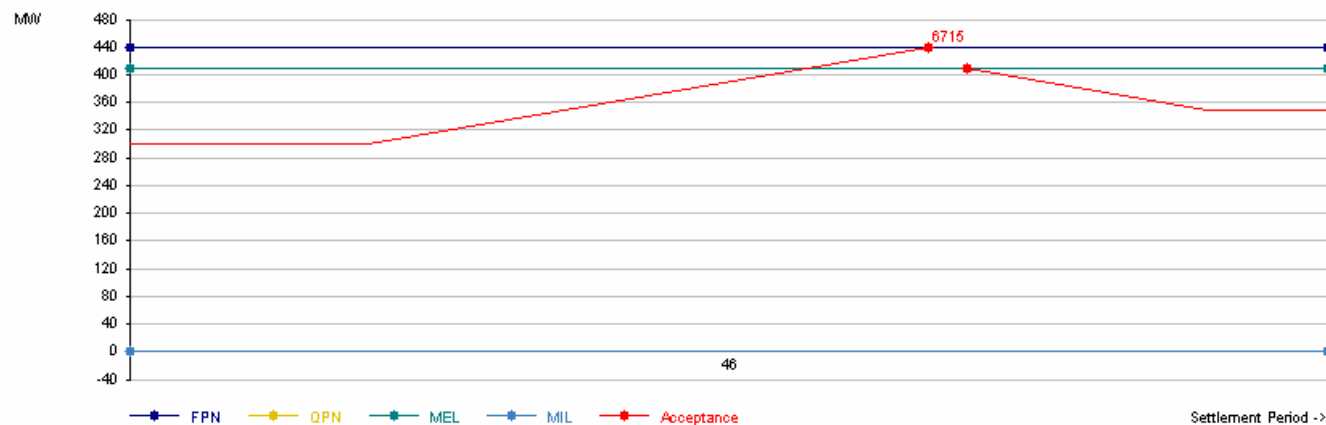
| Sett Period | From Time (GMT) | From Level | To Time(GMT) | To Level |
|-------------|------------------|------------|------------------|----------|
| 28 | 2004-04-01 12:30 | 0.000 | 2004-04-01 13:00 | 0.000 |

Bid-Offer Acceptance Level Data

| Acceptance Id | Acceptance Time | Deemed Flag | From Time (GMT) | From Level | To Time (GMT) | To Level |
|---------------|------------------|-------------|------------------|------------|------------------|----------|
| 11801 | 2004-04-01 12:41 | N | 2004-04-01 12:43 | 530.000 | 2004-04-01 12:51 | 450.000 |
| 11801 | 2004-04-01 12:41 | N | 2004-04-01 12:51 | 450.000 | 2004-04-01 13:21 | 450.000 |

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T_WBUPS-4 Settlement Day (yyyy-mm-dd) 2004-03-22 Period: 46



NB: In this example data from the previous Settlement Period has additionally been included as this indicates the Acceptance being taken from the MEL.

FPN Data

| Sett Period | From Time (GMT) | From Level | To Time(GMT) | To Level |
|--|-----------------|------------------|------------------|----------|
| T_WBUPS-4, T, West Burton Limited, WBUPS-4 | 46 | 2004-03-22 22:30 | 2004-03-22 23:00 | 440.000 |

QPN Data

| Sett Period | From Time (GMT) | From Level | To Time(GMT) | To Level |
|--|-----------------|------------------|------------------|----------|
| T_WBUPS-4, T, West Burton Limited, WBUPS-4 | 46 | 2004-03-22 22:30 | 2004-03-22 23:00 | 0.000 |

Maximum Export Limit

| Sett Period | From Time (GMT) | From Level | To Time(GMT) | To Level |
|--|-----------------|------------------|------------------|----------|
| T_WBUPS-4, T, West Burton Limited, WBUPS-4 | 46 | 2004-03-22 22:30 | 2004-03-22 23:00 | 410.000 |

Maximum Import Limit

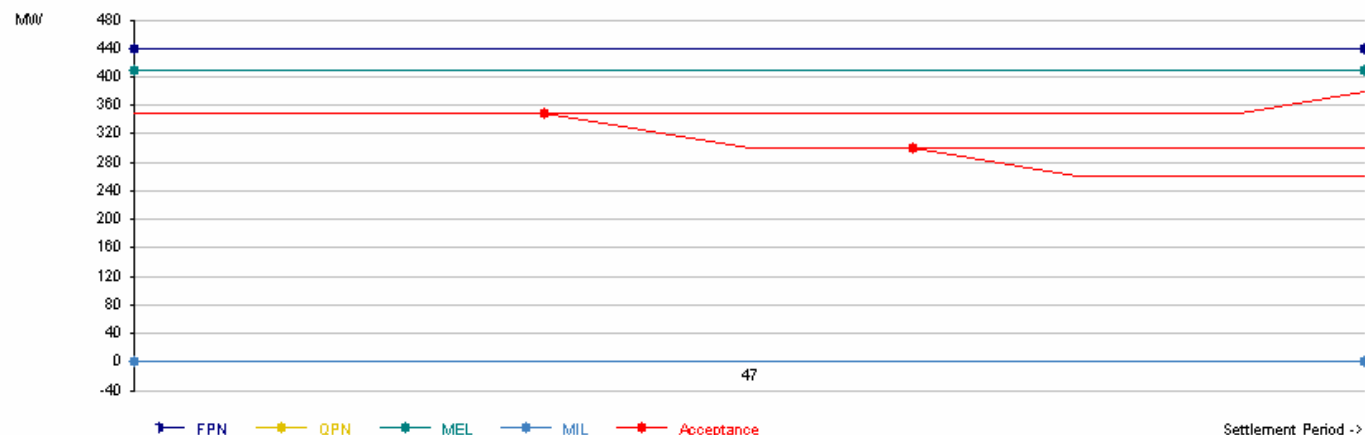
| Sett Period | From Time (GMT) | From Level | To Time(GMT) | To Level |
|--|-----------------|------------------|------------------|----------|
| T_WBUPS-4, T, West Burton Limited, WBUPS-4 | 46 | 2004-03-22 22:30 | 2004-03-22 23:00 | 0.000 |

Bid-Offer Acceptance Level Data

| Acceptance Id | Acceptance Time | Deemed Flag | From Time (GMT) | From Level | To Time (GMT) | To Level |
|--|------------------|-------------|------------------|------------|------------------|----------|
| T_WBUPS-4, T, West Burton Limited, WBUPS-4 | | | | | | |
| 6715 | 2004-03-22 22:13 | N | 2004-03-22 22:26 | 300.000 | 2004-03-22 22:36 | 300.000 |
| 6715 | 2004-03-22 22:13 | N | 2004-03-22 22:36 | 300.000 | 2004-03-22 22:50 | 440.000 |
| 6716 | 2004-03-22 22:49 | N | 2004-03-22 22:51 | 410.000 | 2004-03-22 22:57 | 350.000 |
| 6716 | 2004-03-22 22:49 | N | 2004-03-22 22:57 | 350.000 | 2004-03-22 23:27 | 350.000 |

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T_WBUPS-4 Settlement Day (yyyy-mm-dd) 2004-03-22 Period: 47



FPN Data

| Sett Period | From Time (GMT) | From Level | To Time(GMT) | To Level |
|--|------------------|------------|------------------|----------|
| T_WBUPS-4, T, West Burton Limited, WBUPS-4 | | | | |
| 47 | 2004-03-22 23:00 | 440.000 | 2004-03-22 23:30 | 440.000 |

QPN Data

| Sett Period | From Time (GMT) | From Level | To Time(GMT) | To Level |
|--|------------------|------------|------------------|----------|
| T_WBUPS-4, T, West Burton Limited, WBUPS-4 | | | | |
| 47 | 2004-03-22 23:00 | 0.000 | 2004-03-22 23:30 | 0.000 |

Maximum Export Limit

| Sett Period | From Time (GMT) | From Level | To Time(GMT) | To Level |
|--|------------------|------------|------------------|----------|
| T_WBUPS-4, T, West Burton Limited, WBUPS-4 | | | | |
| 47 | 2004-03-22 23:00 | 410.000 | 2004-03-22 23:30 | 410.000 |

Maximum Import Limit

| Sett Period | From Time (GMT) | From Level | To Time(GMT) | To Level |
|--|------------------|------------|------------------|----------|
| T_WBUPS-4, T, West Burton Limited, WBUPS-4 | | | | |
| 47 | 2004-03-22 23:00 | 0.000 | 2004-03-22 23:30 | 0.000 |

Bid-Offer Acceptance Level Data

| Acceptance Id | Acceptance Time | Deemed Flag | From Time (GMT) | From Level | To Time (GMT) | To Level |
|--|------------------|-------------|------------------|------------|------------------|----------|
| T_WBUPS-4, T, West Burton Limited, WBUPS-4 | | | | | | |
| 6716 | 2004-03-22 22:49 | N | 2004-03-22 22:57 | 350.000 | 2004-03-22 23:27 | 350.000 |
| 6716 | 2004-03-22 22:49 | N | 2004-03-22 23:27 | 350.000 | 2004-03-22 23:33 | 410.000 |
| 6717 | 2004-03-22 23:01 | N | 2004-03-22 23:10 | 350.000 | 2004-03-22 23:15 | 300.000 |
| 6717 | 2004-03-22 23:01 | N | 2004-03-22 23:15 | 300.000 | 2004-03-22 23:59 | 300.000 |
| 6718 | 2004-03-22 23:17 | N | 2004-03-22 23:19 | 300.000 | 2004-03-22 23:23 | 260.000 |
| 6718 | 2004-03-22 23:17 | N | 2004-03-22 23:23 | 260.000 | 2004-03-22 23:56 | 260.000 |