Abnormal Settlement Adjustments Quantification - Western Power Distribution

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Reference: WPD-CF001-001-1.0

This document presents the results of quantification of abnormal Settlement adjustments in the Distribution Price Control Review 4 (DPCR4) period, for the networks owned and operated by Western Power Distribution, as determined in accordance with the two quantification methods that have been put forward – these being the "Engage/SP" quantification method; and the "CE" quantification method.

1 Introduction

Two methods have been put forward for quantifying the impact of abnormal Settlement adjustments on the Distribution Loss Incentive Mechanism (DLIM) – one by Engage Consulting and Scottish Power Energy Networks (the Engage / SP method – link); and one by Northern Powergrid[1] (the CE method - (link[2]).

Ofgem is currently consulting on the impact of abnormal Settlement adjustments on the DLIM (link); including which of these two methods to use. They have asked DNOs provide indicative results for each in their consultation responses.

This paper presents the results in accordance with these methods for the distribution networks operated by Western Power Distribution (WPD). It assumes the reader is familiar with operation of the DLIM, the industry issue being addressed and both candidate quantification methods.

1.1 Methods and Data Analysed

The objective of our analysis was to quantify the abnormal adjustments to Settlement data in DPCR4 in accordance with the Engage / SP and CE methods referred to above.

In order to do this, we analysed a large volume of Settlement data provided by ELEXON and "P222 EAC" data provided by relevant Non Half Hourly Data Aggregators (NHHDAs).

[1] Formerly CE Electric.
[2] Particularly sections 9-12 and 18-23.

The ELEXON data was at Grid Supply Point (GSP) Group level (and not distribution network level). However, it is very likely the impact of this is well within the tolerances of the quantification methods. ELEXON data was also only available back to July 2005 (3 months into DPCR4). It is likely that having data before this time, particularly in order to establish what was normal when DPCR4 targets were set, would improve the integrity of the results. Data sources other than ELEXON's market monitoring systems – such as the industry flows produced by ELEXON's and Suppliers' agents – would need to be used to achieve this.

P222 datasets were not available from all NHHDAs for the same snapshot months. As a consequence, dataset from surrounding months had to be merged for the East Midlands and Midlands GSP Groups[3]; and extrapolation was required for all GSP Groups, based on NHH MPAN counts, to scale the error to the full network.

1.2 Disclaimer

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[3] In a manner that did not double count.

2 Losses

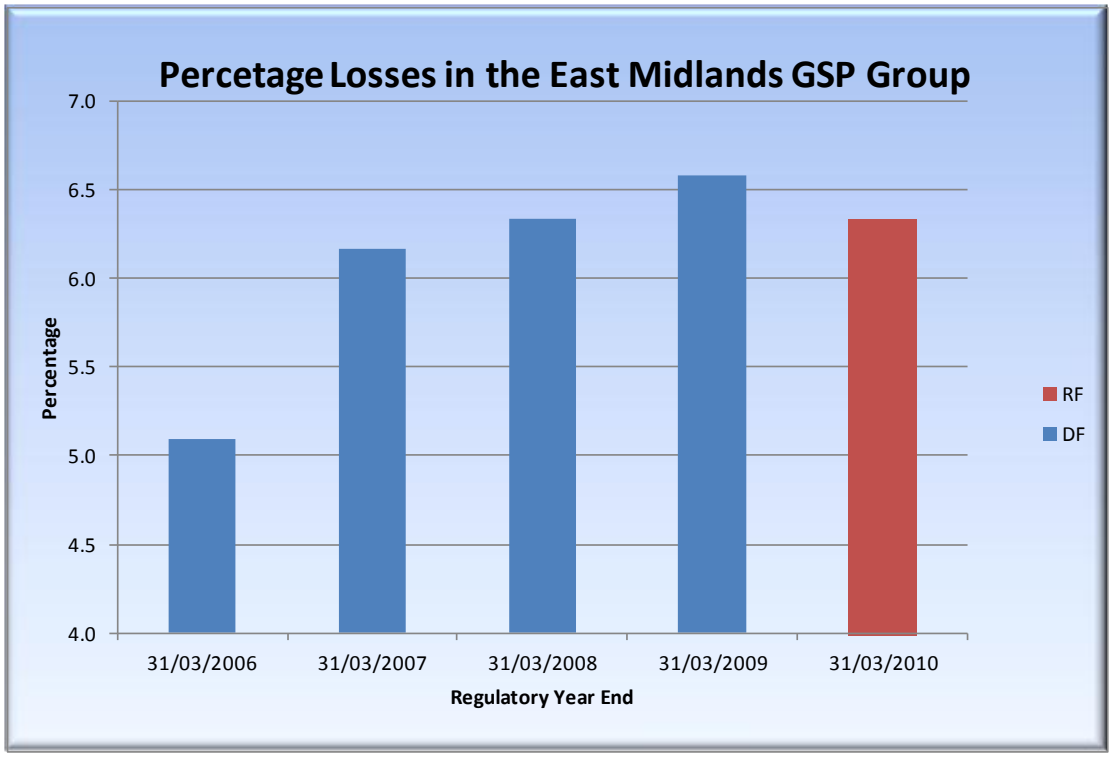
Losses are defined as units entering the network minus units leaving the network, as determined by the Balancing and Settlement Code (BSC) Settlement processes. This difference is attributable to:

- "technical losses" – heating in the wires and transformers in the network; and
- "non technical losses" – including theft and issues with the quality of the data used in the calculation.

It would appear that several Suppliers have made abnormal adjustments to Settlement data that has artificially inflated the determination of losses. The scale of this can be seen in the following graph, determined from Settlement data as[4]:

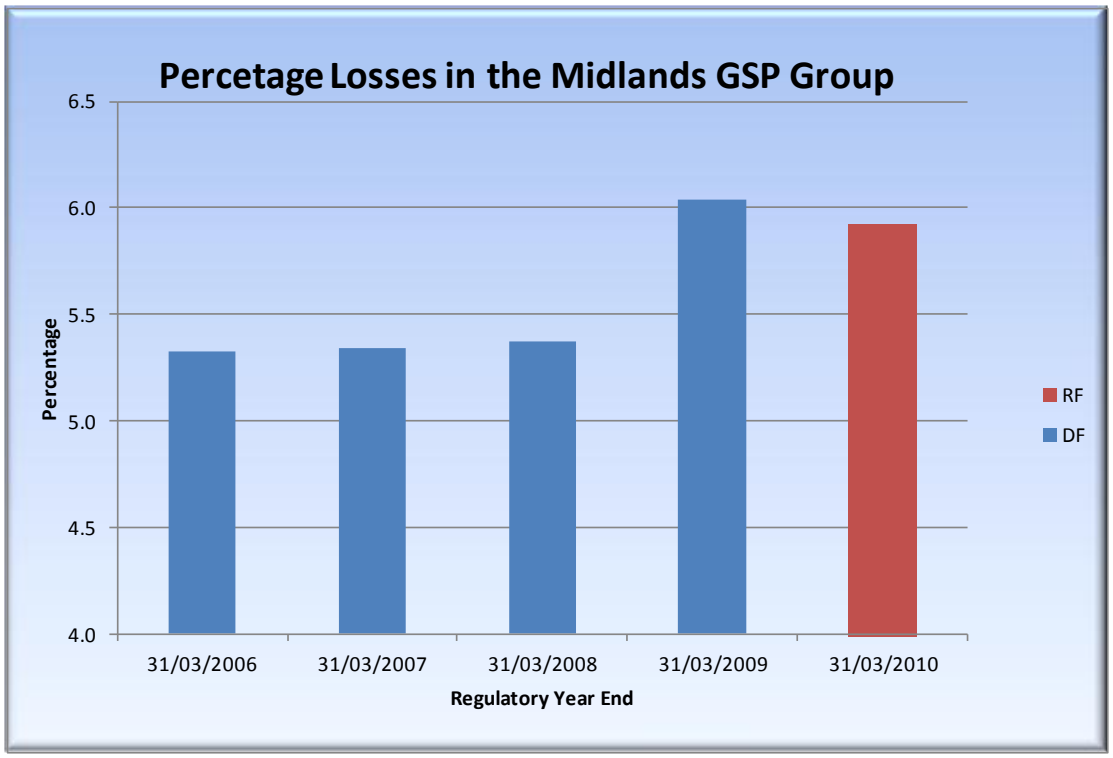
$$Percentage\ Losses = 100 * \frac{Units\ In - Units\ Out}{Units\ Out}$$

Graph 1 - Scale of Impact on "Losses" in the East Midlands (_B) GSP Group

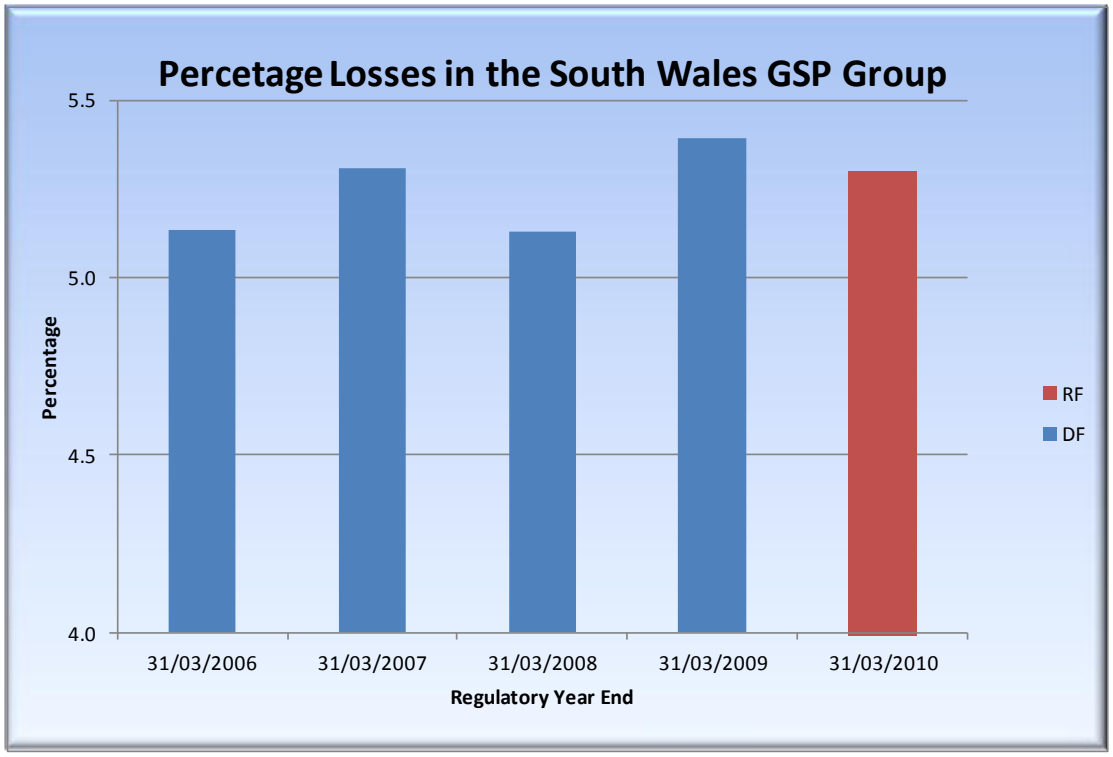


[4] Calculation is consistent with the regulatory formula, but the results will be slightly different as the data sets used are for GSP Groups and, for simplicity, use GSP Group Takes which treat certain types of demand as negative generation (the most significant of which is CVA registered demand). The objective of the graph is to demonstrate the relative scale of the changes rather than the precise value of loss percentages.

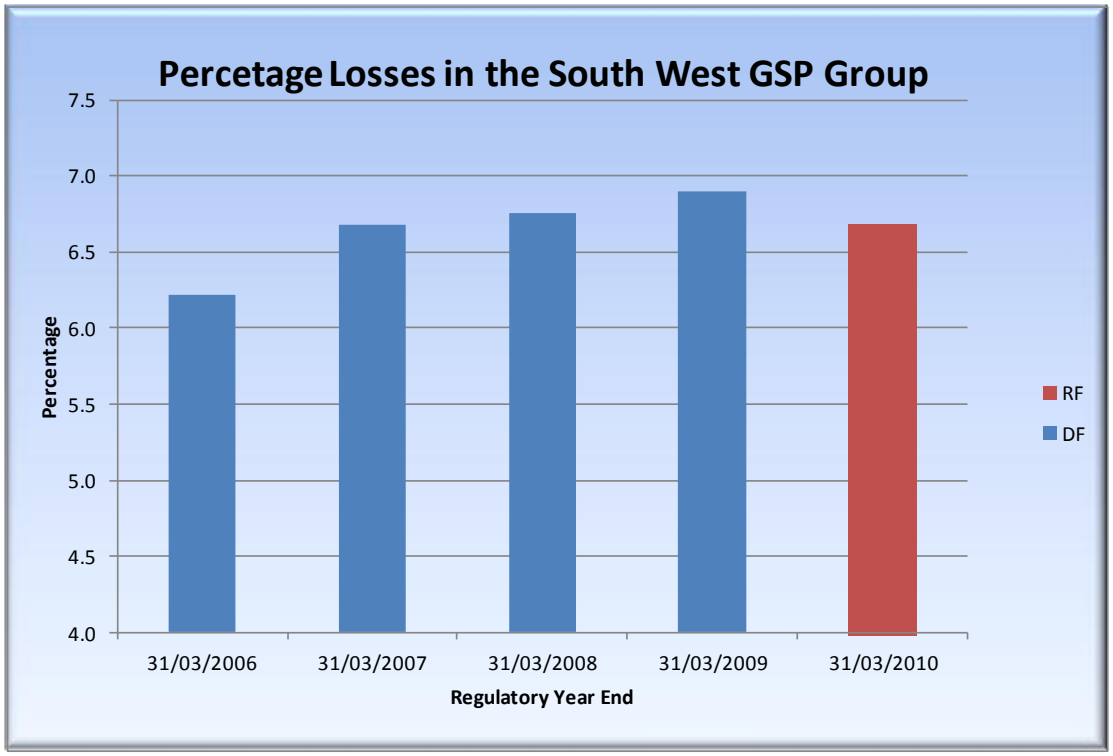
Graph 2 - Scale of Impact on "Losses" in the Midlands (_E) GSP Group



Graph 3 - Scale of Impact on "Losses" in the South Wales (_K) GSP Group



Graph 4 - Scale of Impact on "Losses" in the South West (_L) GSP Group

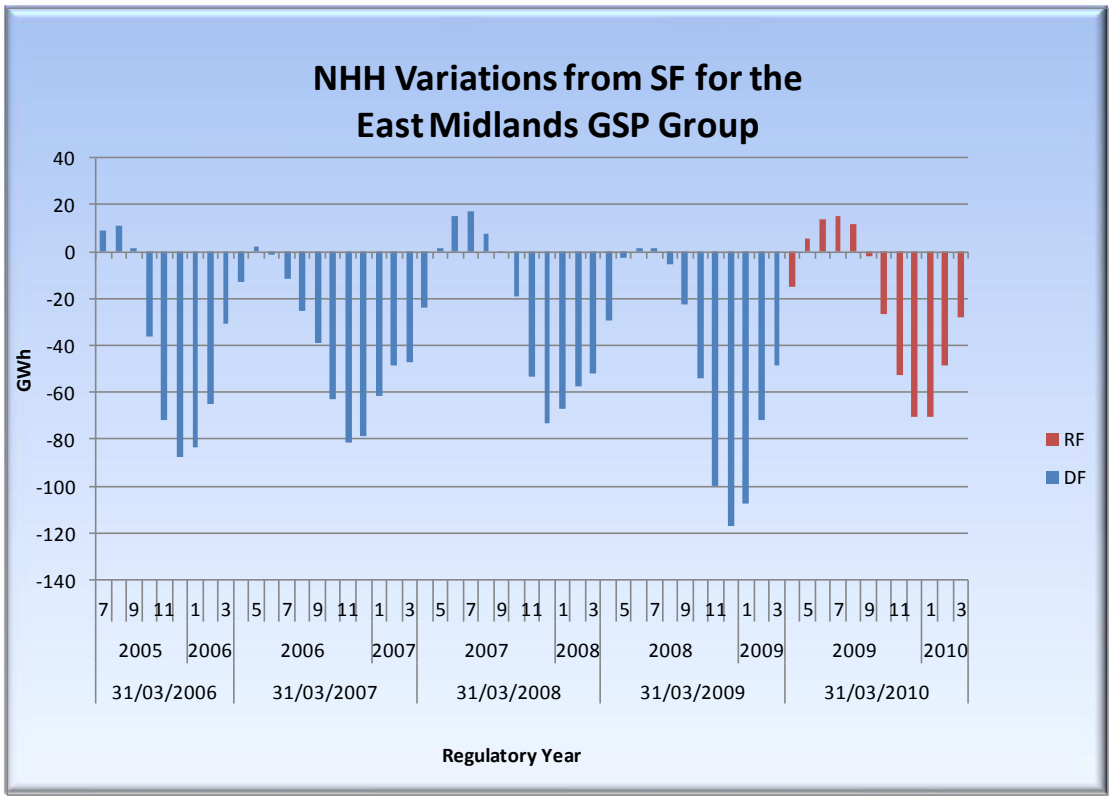


3 Engage / SP Method

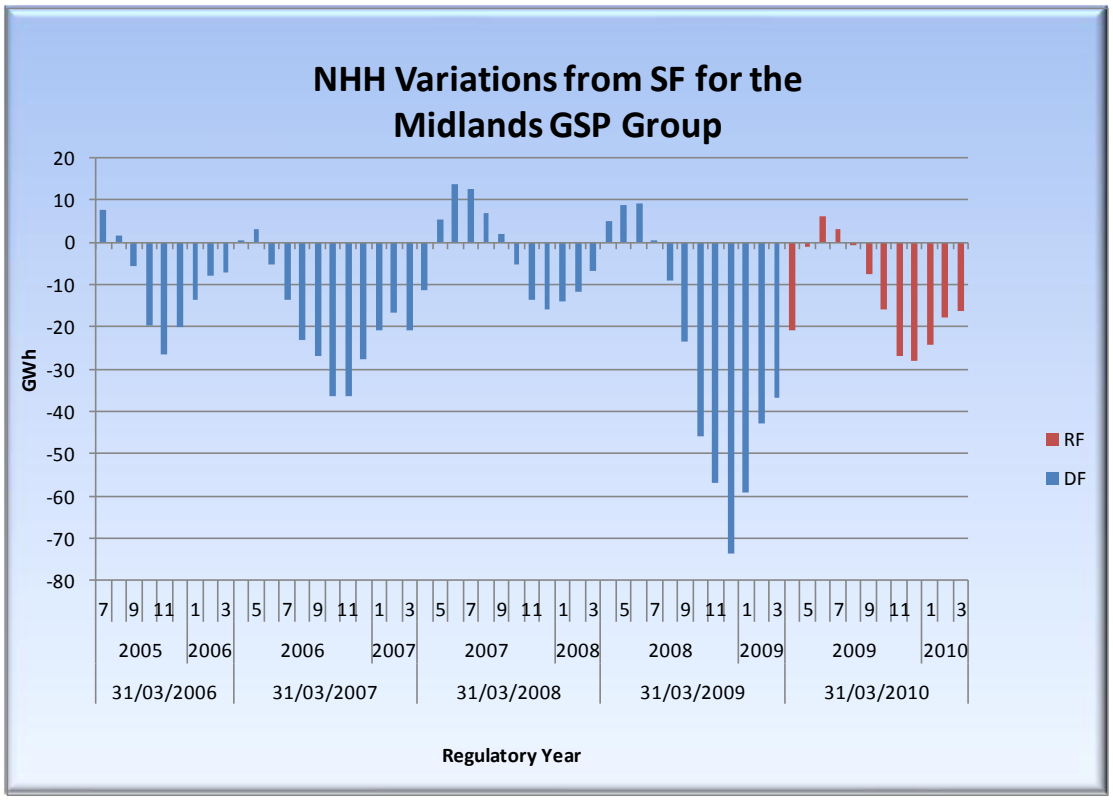
3.1 Observed Run Type Variations

The observed variations in non half hourly (NHH) energy between Settlement runs for the East Midlands (_B), Midlands (_E), South Wales (_K) and South Western (_L) GSP Groups are shown in the graphs below.

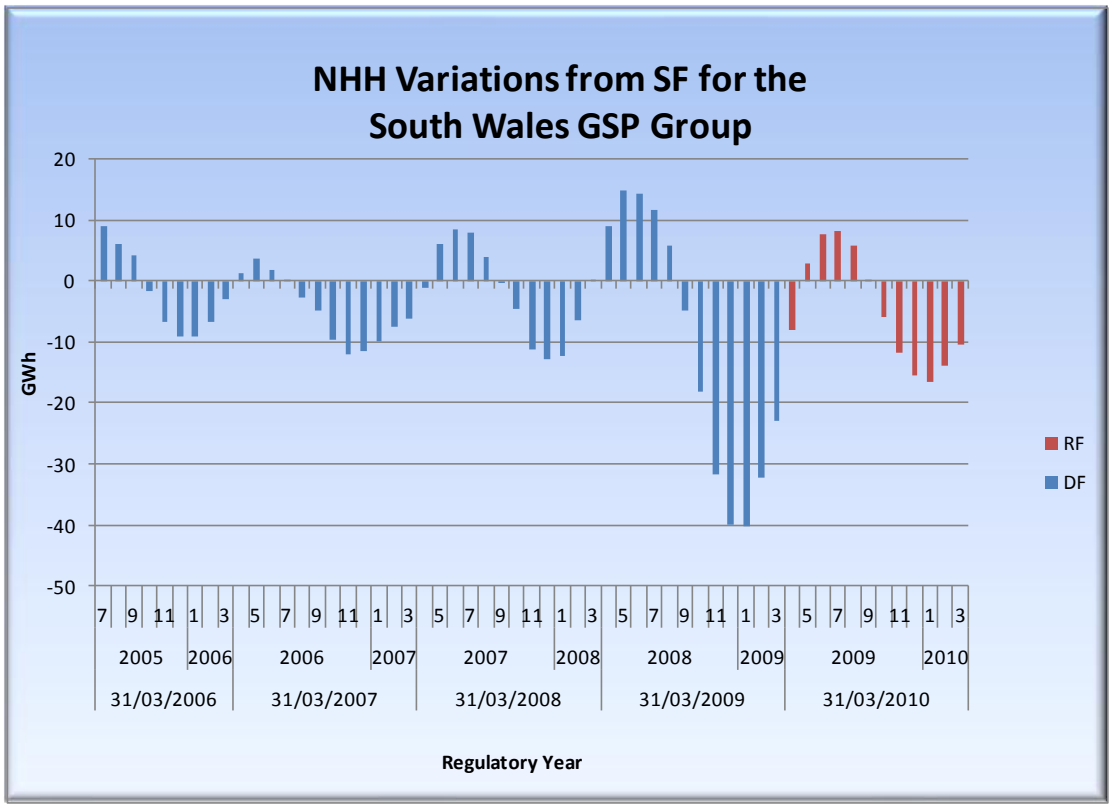
Graph 5 – Observed Settlement Variations in the East Midlands (_B) GSP Group



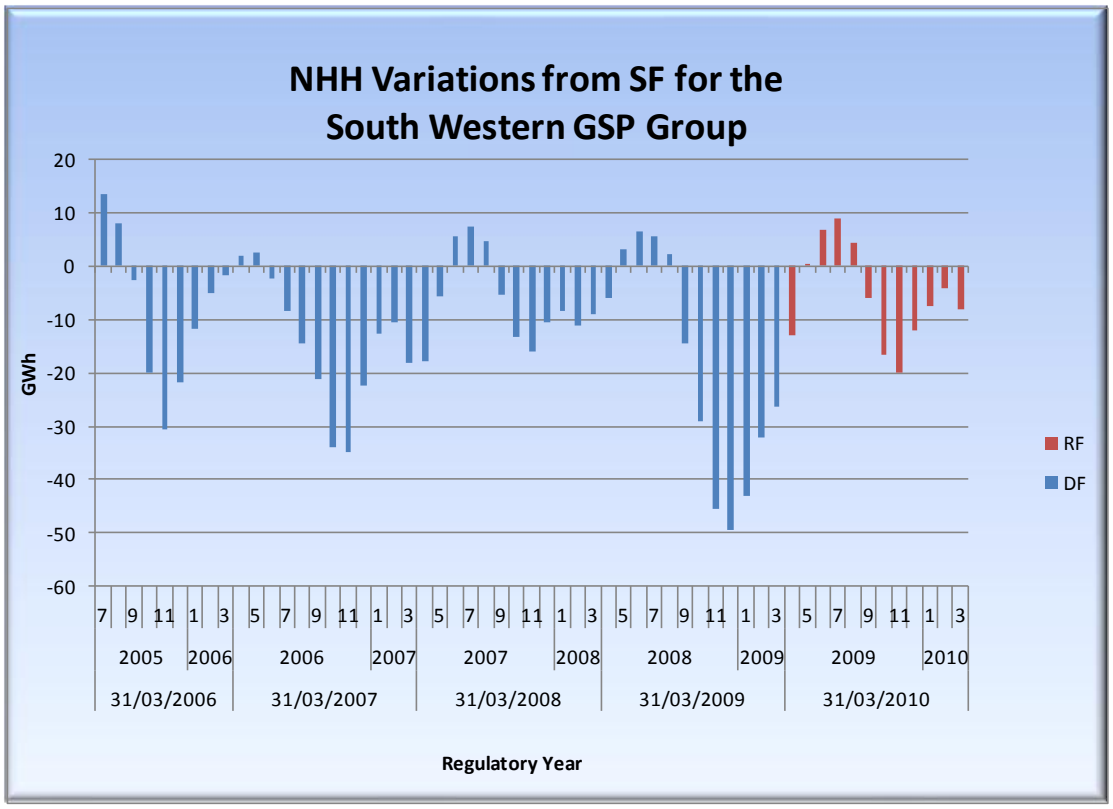
Graph 6 – Observed Settlement Variations in the Midlands (_E) GSP Group



Graph 7 – Observed Settlement Variations in the South Wales (_K) GSP Group



Graph 8 – Observed Settlement Variations in the South Western (_L) GSP Group

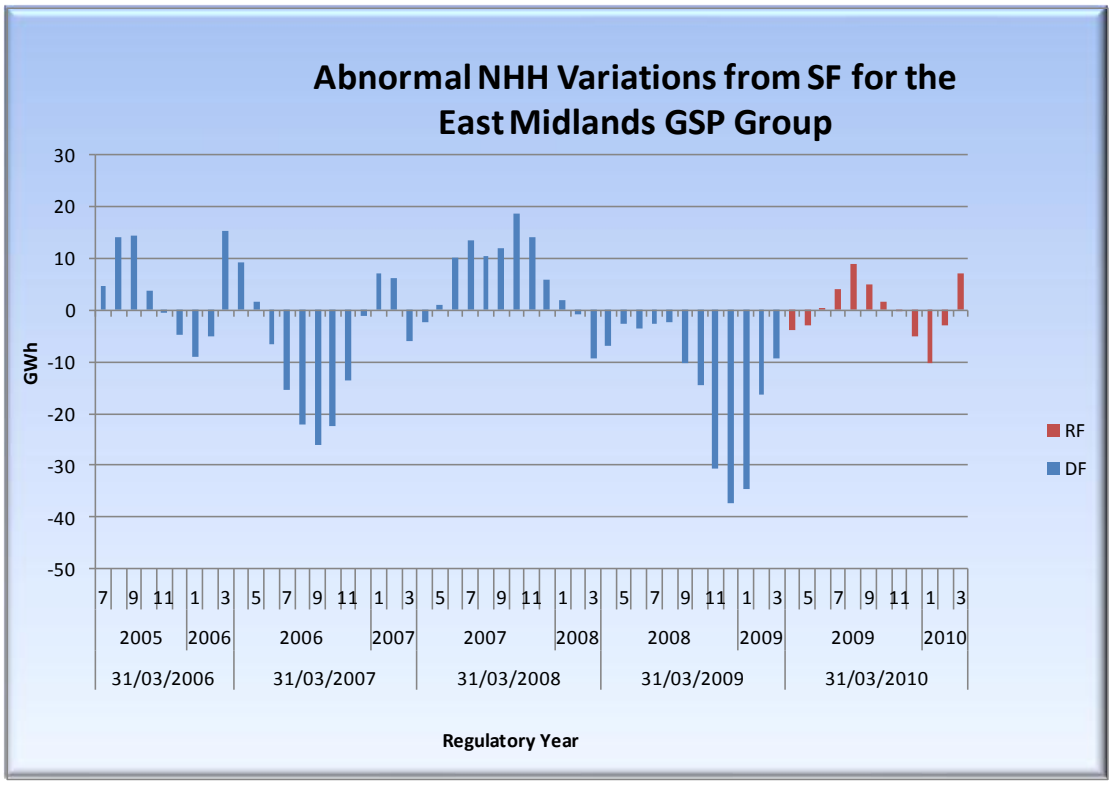


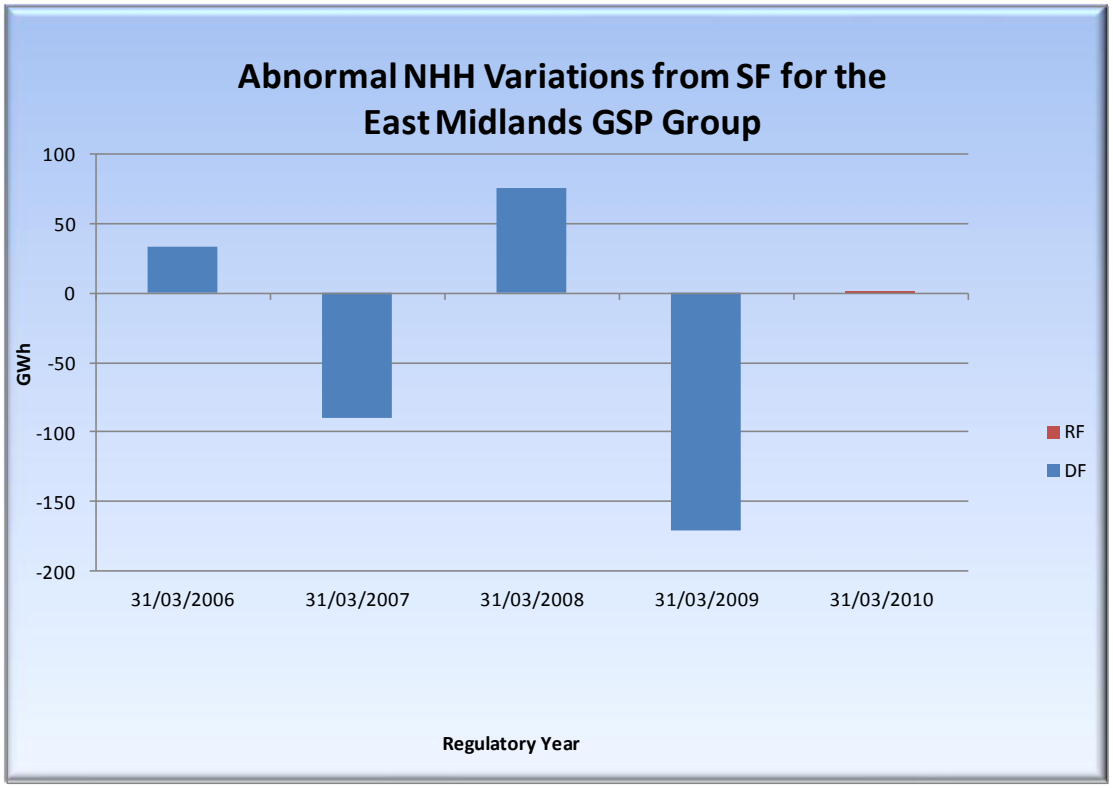
3.2 Stage 1 - Abnormal Run Type Variation Quantification

In accordance with the methodology, in order to quantify the Abnormal Variations (AV) between run types, natural variations were determined from "stable" historical periods and these were netted off Observed Variations (OV).

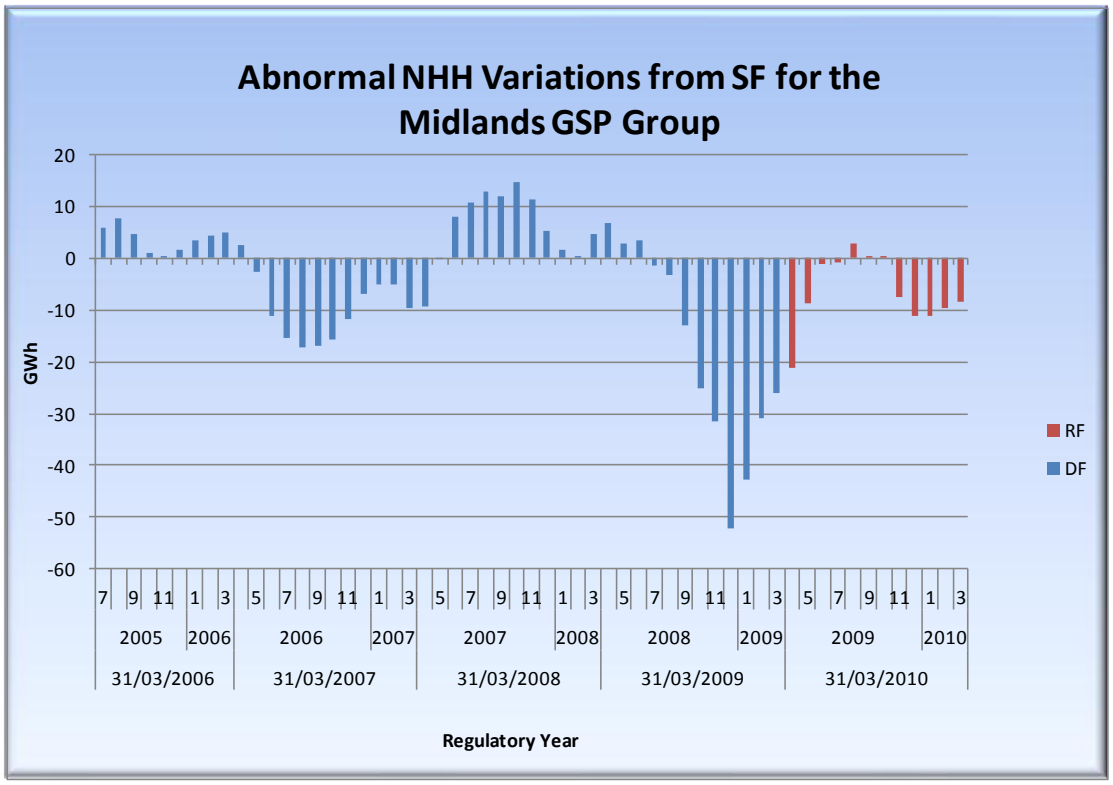
The stable period chosen was, as Ofgem has requested, the earliest date for which data was available from ELEXON (1 July 2005) to 31 August 2008.

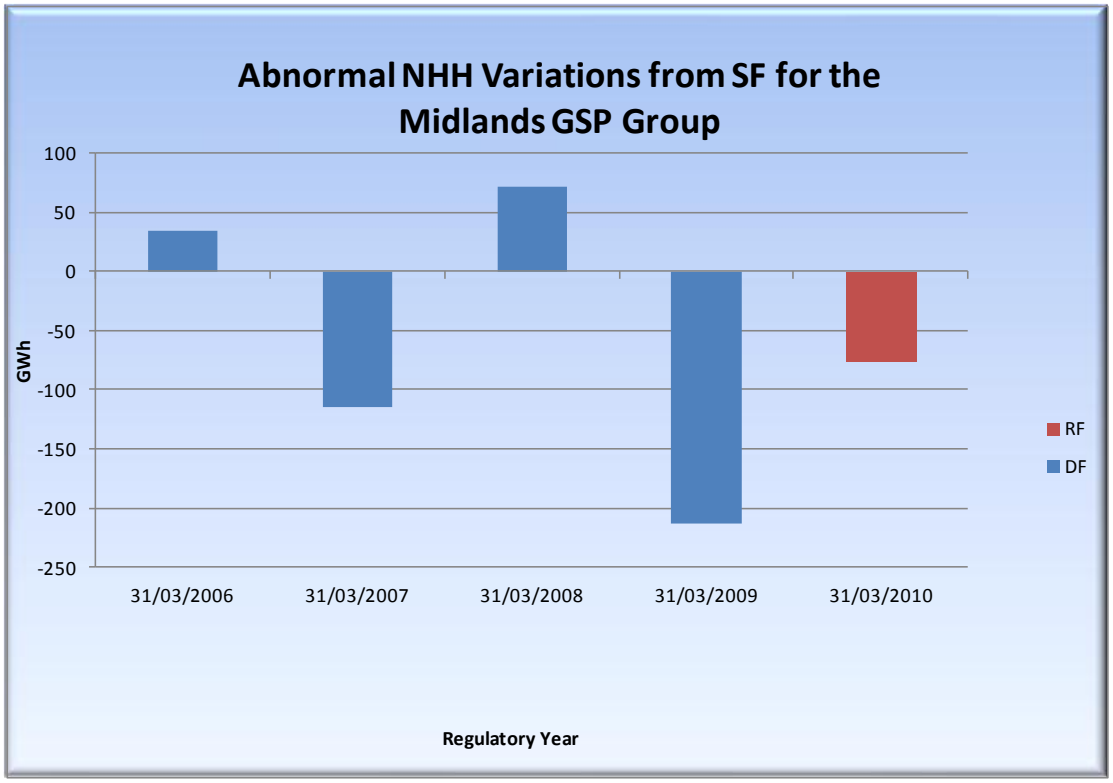
Graph 9 – Abnormal Settlement Variations in the East Midlands (_B) GSP Group



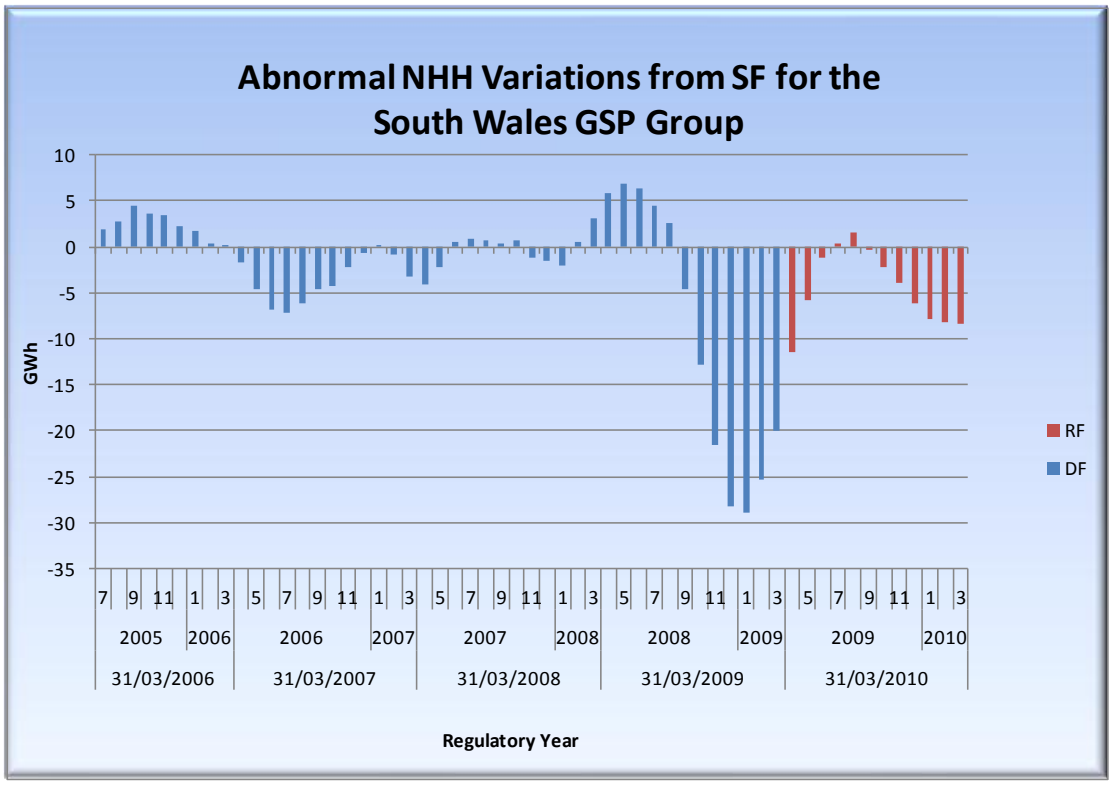


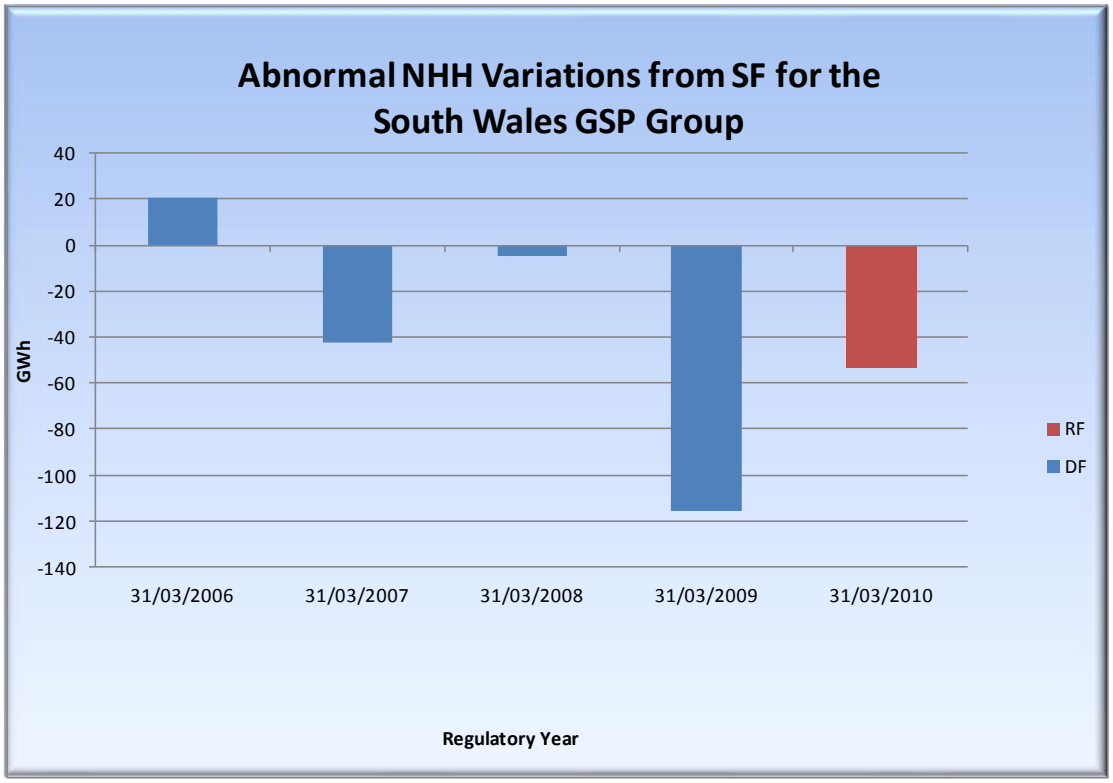
Graph 10 – Abnormal Settlement Variations in the Midlands (_E) GSP Group



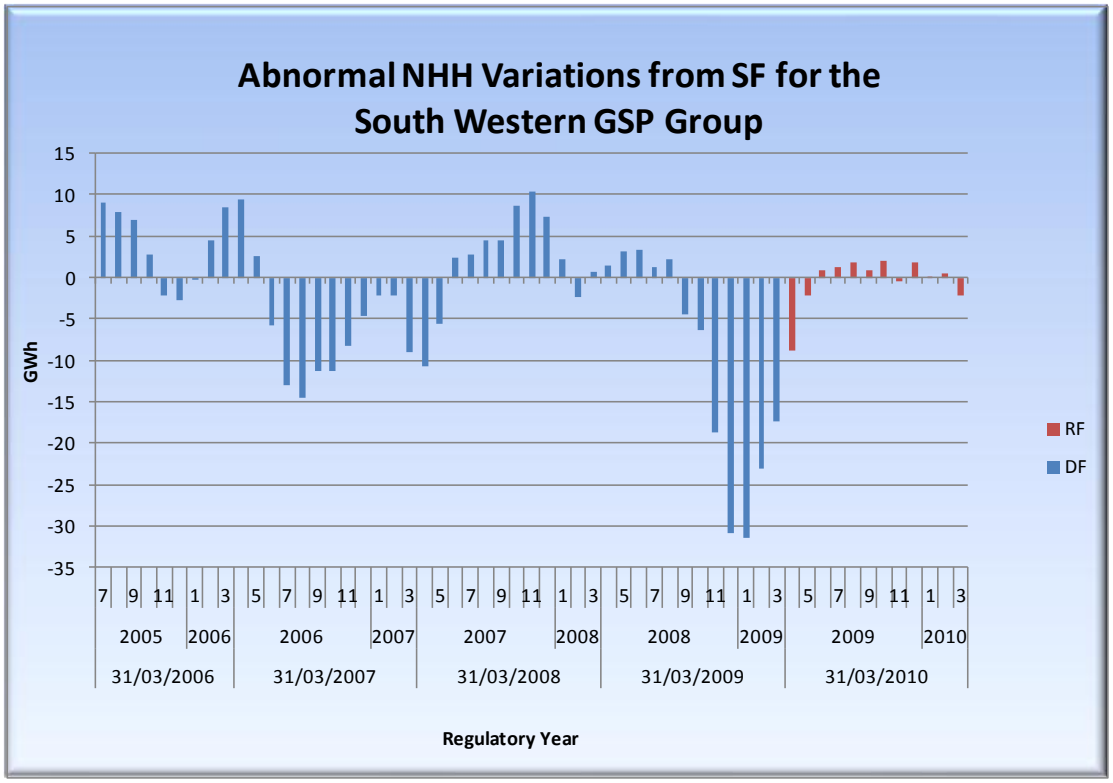


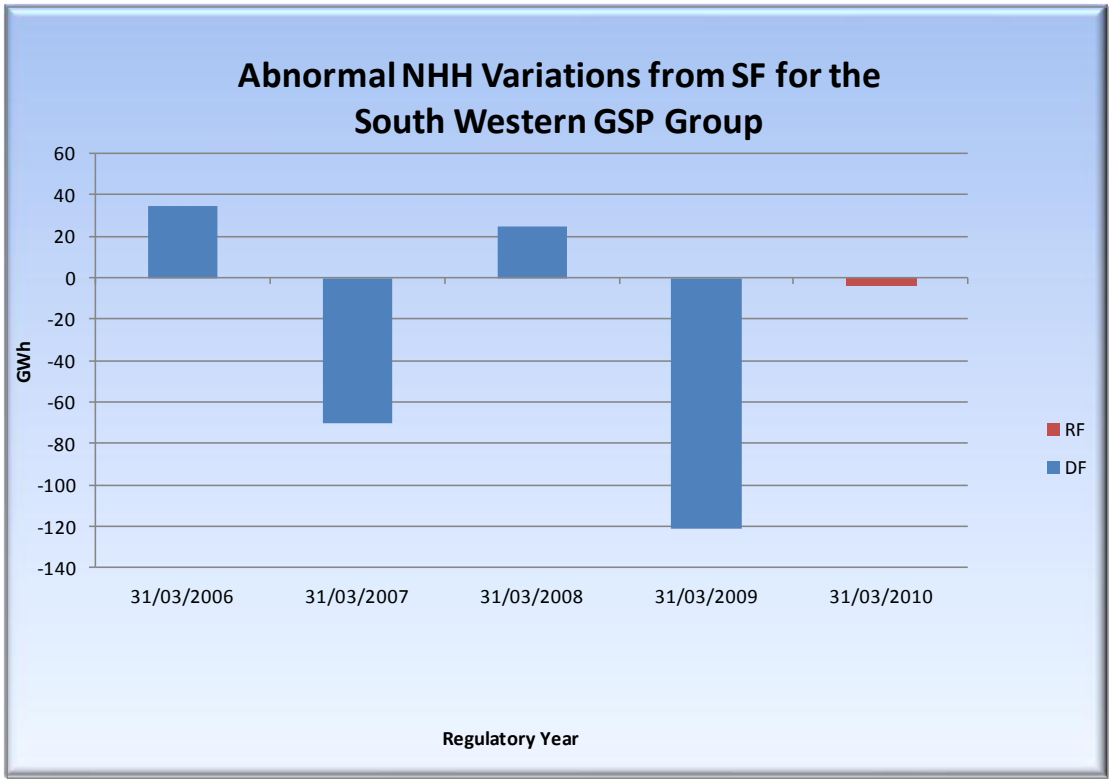
Graph 11 – Abnormal Settlement Variations in the South Wales (_K) GSP Group





Graph 12 – Abnormal Settlement Variations in the South Western (_L) GSP Group





The results of the Abnormal Variation Quantification are detailed in the "Settlement Date Results" sheet of the "Option 2 Questions" attachment embedded at the end of this document.

3.3 Stage 2 – SF Normalisation

In accordance with the methodology, the SF position, from which the abnormal variations detailed in section 3.2 were measured, was normalised. This was principally to deal with:

a) the recession and EACs used in SF not being reflective of changes in consumer behaviour; and

b) prior year adjustments resulting in unrealistic forward looking EACs used in SF.

The normalisation period chosen was, as Ofgem has requested, regulatory years ending 31st March 2006[5], 2007 and 2008.

The results of the SF Normalisation are detailed in the "Settlement Date Results" sheet of the "Option 2 Questions" attachment embedded at the end of this document.

3.4 Resultant Quantification of Abnormal Adjustments

The magnitude of the Abnormal Adjustments is the Abnormal Variations described in section 3.2 plus the SF Normalisation described in section 3.3.

The overall results of the Abnormal Adjustment quantification are detailed in the "Settlement Date Results" sheet of the "Option 2 Questions" attachment embedded at the end of this document.

3.5 Settlement Run Date Reporting Impact

WPD reports Settlement adjustments for the purposes of the loss incentive scheme in the regulatory year that the reconciliation runs take place (as opposed to the regulatory year in which the Settlement Dates fall).

In accordance with the methodology, the Abnormal Variations and SF Normalisation quantified in sections 3.2 and 3.3 were mapped to the respective regulatory years in order to determine the regulatory loss reporting impact.

The results are detailed in the "Settlement Report Date Results" sheet of the "Option 2 Questions" attachment embedded at the end of this document.

[5] Only date from 1st July 2005 was considered as this is the earliest date ELEXON has data for.

4 CE Method

In accordance with the methodology:

a) post R3 (third reconciliation) run type variations were set to zero; and

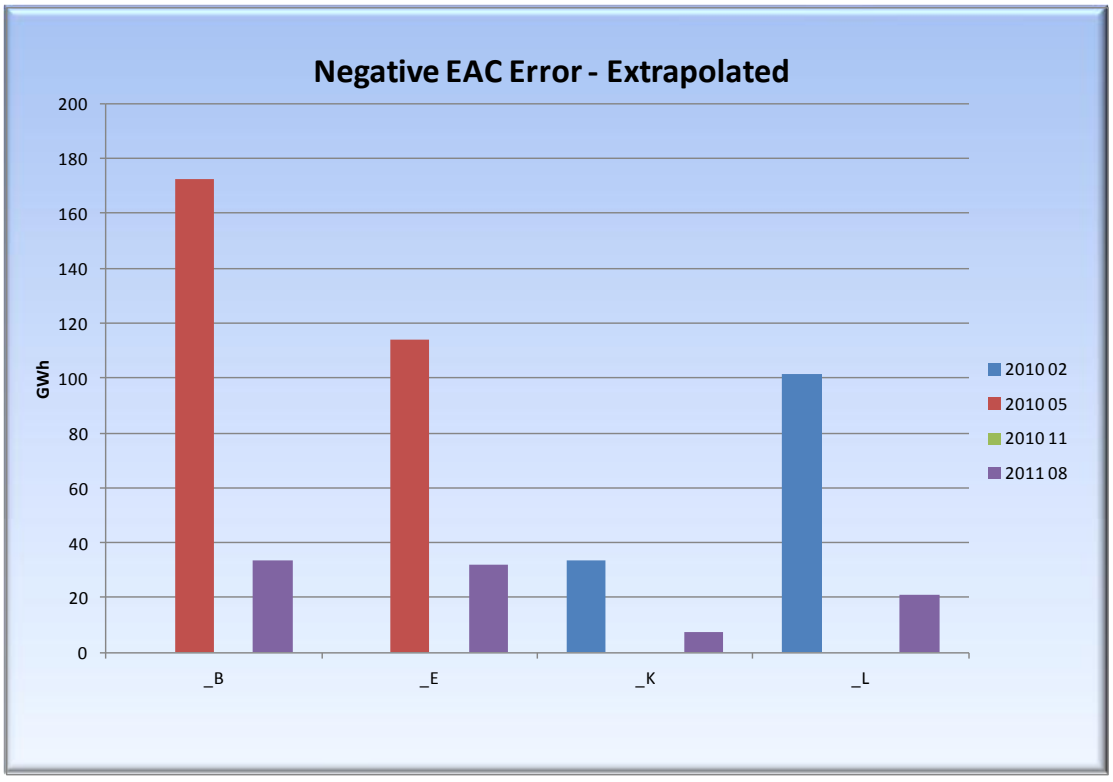
b) R3 and pre-R3 run type variations were normalised to like month average percentage variations in a prior normalisation period.

The prior normalisation period for b) above was, as Ofgem has requested, regulatory years ending 31st March 2006, 2007, 2008 and 2009. However, it is not clear whether the intention is for this normalisation to be based on Settlement Dates in the regulatory years, or Settlement Reporting Dates in the regulatory years. Consequently two sets of results have been produced – one for each[6].

The values were then differenced from actual post R3 variations and actual pre-R3 variations (respectively) to give Settlement Date based regulatory year results. These results were also mapped to Settlement Reporting Date regulatory years.

In addition, negative EACs were analysed from P222 data provided by NHHDAs. The volume of negatives EACs is shown in the graph below.

Graph 13 – Extrapolated Negative EAC Error



These results are all detailed in the "Settlement Date Results" and "Settlement Report Date Results" sheets (respectively) of the "Option 1 Questions" attachments embedded at the end of this document.

[6] Subject to the proviso that only Settlement Dates from 1st July 2005 were considered as this is the earliest date ELEXON has data for.

5 Results

Results are contained in the following spreadsheets:

a) Option 2 – Engage / SP Method:

WPD Option 2
Questions V3.xlsx

b) Option 1 – CE Method:

Settlement Date based pre-R3 normalisation:

WPD Option 1
Questions V3a.xlsx

Settlement Report Date based pre-R3 normalisation:

WPD Option 1
Questions V3b.xlsx