

# **Balancing Principles Statement Report**

1 October 2007 to 30 September 2008

As required by Standard Condition C16  
of National Grid's Electricity Transmission Licence

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## **Balancing Principles Statement Report for National Grid Electricity Transmission 1 October 2007 to 30 September 2008**

### **Executive Summary**

National Grid has developed a Balancing Principles Statement (BPS) in accordance with Licence requirements to define the broad framework within which balancing action decisions are made.

The BPS is intended to help electricity market participants to understand actions National Grid may take to achieve the efficient, economic and co-ordinated operation of the transmission system. To assist with this we have also held regular industry fora where we have provided data, detailed explanations of our balancing actions and answers to questions raised by participants.

This report demonstrates that throughout the period from 1 October 2007 to 30 September 2008, National Grid has operated the GB Transmission Systems in accordance with the guidelines set out in the Balancing Principles Statement. Our compliance with the BPS is subject to independent external review. A statement from the external auditor (PricewaterhouseCoopers) accompanies this report.

#### Key events highlighted in this report:

There were no Emergency Instructions or requests for Maximum Generation Service. There were 5 occasions where Emergency Assistance was requested by National Grid. There were 4 requests for Emergency Assistance that were provided by National Grid.

There was one occasion when Demand Control instructions were issued following an unprecedented loss of generation. Automatic action of LF relays arrested the frequency fall and Demand Control Stage 1 was initiated across up to nine Distribution Network Operators simultaneously.

No Negative Reserve Active Power Margin (NRAPM) Warnings were issued. There was one incidence of a localised NRAPM due to high wind generation output and low pumping in Scotland over a minimum demand period. A GT was desynchronised to relieve the problem.

There were no occasions of system or partial system shutdown or islanding. No Black Start services were called off.

Our Balancing Mechanism IT systems achieved 99.648% availability (excluding planned outages) in this reporting period.

There were 6 occasions where BMUs were disconnected as a result of faults on the GB Transmission System.

During this reporting period National Grid agreed 20 Pre Gate-closure BMU Transactions (PGBTs).

## **Balancing Principles Statement Report for the period – 1 October 2007 to 30 September 2008**

### **1. BPS Part A: Introduction**

National Grid has developed a Balancing Principles Statement (BPS) in accordance with Licence requirements in order to define the broad framework within which balancing action decisions are made.

The BPS is intended to help electricity market participants to understand actions National Grid may take to achieve the efficient, economic and co-ordinated operation of the transmission system.

An overview of the BPS is contained in Appendix 1.

Our compliance with the BPS is subject to independent external review and reflected in this annual report. Appendix 2 of this report contains an opinion from the external auditors.

### **2. BPS Part B: General Principles**

The BPS is written to be consistent with our Licence obligation to operate the system in an efficient, economic and co-ordinated manner.

In determining which balancing measures to employ, we take account of various sources of information. These include Balancing Mechanism Unit (BMU) data, our demand forecasts, our Transmission outage plan, actual system conditions and any other relevant data (Grid Code BC 1.4.2 (f)).

In certain circumstances, we may need to issue Emergency Instructions or Involuntary Reductions in order to preserve the integrity of the Transmission System. These circumstances may include system events and situations involving the requirement for demand control, Negative Reserve Active Power Margin, Black Start, frequency response and communication failure. In these circumstances it may be necessary to depart from normal Balancing Mechanism operation in accordance with Grid Code BC2.9.

**Throughout the period from 1 October 2007 to 30 September 2008, National Grid has operated the GB Transmission Systems in accordance with the general principles set out in the Balancing Principles Statement.**

**We are permitted in certain circumstances to operate the system outside the normal principles of Balancing Mechanism operation (as described in the BPS). Specific occurrences are covered in more detail below.**

The following table summaries the reporting sections for the last 4 years.

Category	Oct 2004 – Sep 2005	Oct 2005 – Sep 2006	Oct 2005 – Sep 2006	Oct 2007 – Sep 2008
Emergency Instructions	0	0	0	0
Interconnector Emergency Assistance	2	1	7	9
Demand Control	0	0	1	1
NRAPM warnings	0	0	0	0 <sup>1</sup>
Black Start / Islanding	0 / 1	0	0	0
Maximum Generation Service	0	1	0	0
Availability of National Grid Balancing Mechanism systems	99.83%	99.85%	99.70%	99.648%
Involuntary Reductions	0	0	1	0
No. of BMUs disconnected by Transmission System faults	1	0	4	6

Note 1 – see section 2.3

## 2.1 Emergency Instructions

In certain circumstances, it may be necessary for National Grid to issue Emergency Instructions in order to preserve the integrity of the Transmission System and any synchronously connected external system. In such circumstances, it may be necessary to depart from normal Balancing Mechanism operation in accordance with BC2.9 of the Grid Code.

**There were no Emergency Instructions or requests for Maximum Generation Service. There were 5 occasions where Emergency Assistance was requested by National Grid. There were 4 requests for Emergency Assistance that were provided by National Grid. (Grid Code section BC2.9.6)**

## 2.2 Demand Control

A situation may arise in BM timescales where there is insufficient active power generation available to meet demand, or there may be local operating problems on part of the transmission system. Under these circumstances, it may be necessary for Network Operators and National Grid to make provisions for the reduction of demand in accordance with Grid Code OC6.

**There was one occasion when Demand Control instructions were issued by National Grid.**

**On the 27th May 2008 an exceptional loss of some 1582MW of generation within two minutes (11:34am and 11:36am) resulted in a major system disturbance. The immediate effect of this loss was to take the system out of normal operating conditions which eventually led to the triggering of automatic low frequency relays to preserve the integrity of the wider electricity system. As a consequence some 581MW of demand was automatically shed at 11:37am.**

**This unprecedented generation loss led to the use of system warnings by National Grid and the application of demand control under the Grid Code across up to nine Distribution Network Operator (DNO) regions simultaneously.**

### 2.3 Negative Reserve Active Power Margin

In order to ensure system security, National Grid must always be able to schedule sufficient frequency responsive plant to contain system frequency against the largest credible loss of generation or demand. Under conditions of low system demand (particularly overnight demand troughs during summer weekends), the generation notified to us may not include enough plant capable of providing this response. Under these circumstances we would normally accept bids to desynchronise unresponsive plant and accept offers to replace this plant with more responsive generation.

However, in extreme cases, there could be an insufficient volume of bids available to reduce the level of unresponsive generation. In these circumstances, National Grid issues Negative Reserve Active Power Margin (NRAPM) warnings to the market to signal the shortage of responsive plant and request additional plant flexibility. If the NRAPM warnings have no effect, as a last resort National Grid could instruct plant to desynchronise under these NRAPM conditions in accordance with Grid Code section BC2.9.4.

**No NRAPM Warnings have been issued. There was one incidence of localised Negative Reserve Active Power Margin (NRAPM) on the 24<sup>th</sup> August 2008 due to high wind generation output and low pumping in Scotland over a minimum demand period. A GT was taken off to relieve the problem.**

### 2.4 Black Start / Islanding

Under extreme conditions (e.g. multiple circuit trippings during severe weather), parts of the Transmission System could become disconnected from the main system, or islanded. In addition, there could be a "partial shutdown" where all generation has ceased in an island, or a "total shutdown" where all generation has ceased in the total system and there is no electricity supply from external Interconnectors.

Grid Code section OC9 describes the implementation of recovery procedures following a total or partial shutdown (Black Starts), the re-synchronisation of islands and the Joint System Incidents Procedure which would apply under the above circumstances. National Grid has Ancillary Service contracts with certain generators to provide a Black Start capability to re-establish supply following a partial or total system shutdown.

**There were no occasions of system or partial system shutdown or islanding. No Black Start services were called off (excluding routine testing).**

## 2.5 Communication Failures

This subject is covered in both Grid Code BC2.9.7 and BPS Part B section 5(g). A communication failure is defined in the BPS as an “unplanned outage of the electronic data communication facilities or National Grid’s associated computing facilities preventing normal Balancing Mechanism operation”. Under these circumstances, National Grid will normally issue a “National Grid Computing System Failure Notification” as soon as it is reasonably able to do so. This will normally be issued via the Balancing Mechanism Reporting System and where possible will indicate the likely duration of the outage.

**Our Balancing Mechanism IT systems achieved 99.648% availability (excluding planned outages) in this reporting period.**

## 2.6 Involuntary Reductions

This subject is covered in BPS Part B section 6. Under certain exceptional circumstances, National Grid may need to instruct reductions in generation or demand before all valid and relevant Balancing Mechanism bids or offers have been accepted. This could be to preserve system response or reactive reserve levels, or as a result of automatic measures (e.g. the operation of an intertrip), or because communication problems prevent other relevant bids or offers being instructed. Involuntary Reductions include Demand Reduction and Disconnection referred to in Grid Code OC6.

**There were no occasions of Involuntary Reductions; no BMUs were instructed outside their submitted bid-offer ranges.**

## 3. BPS Part C: Principles underlying Balancing Measures

There are a number of principles described in the BPS that underpin the measures National Grid will take to balance the system. The balancing measures include the acceptance of bids and offers, call off of Ancillary Service contracts and other services, and instruction of Emergency Actions and other Involuntary Reductions. These measures are called off in cost order unless this is not possible under circumstances described in Part C section 5. Part C also describes the treatment of BMUs disconnected by Transmission System faults.

**We have used balancing measures in cost order wherever possible during this reporting period, with exceptions being in line with the circumstances described in BPS Part C section 5.**

**The only exceptions to this being where incorrect prices had been applied to three reserve GTs, resulting in slightly less economic despatch. The relevant Parties have been informed and internal processes reviewed and updated.**

### 3.1 Treatment of BMUs disconnected by Transmission System faults

This subject is referred to in BPS Part C paragraph 6. In unusual situations, BMUs may become disconnected from the Transmission System following Transmission System faults.

**There were 6 occasions where BMUs were disconnected as a result of a Transmission System fault. These are summarised in the table below.**

	Scotland North	Scotland South	England & Wales
<b>Weather</b>	2	1	0
<b>Transmission Eqpt Failure</b>	0	0	1
<b>Field Issues</b>	0	1	0
<b>Unknown</b>	1	0	0

### 3.2 Pre Gate Closure BMU Transactions

Contracts will be entered into outside the BM when we anticipate a shortage of appropriate Offers and Bids in the BM to meet system security requirements, or if we consider that such contracts will lead to a reduction in overall cost or provide technical characteristics that are not available through BM Offers and Bids.

	Number	Vol (GWh)	Cost (£m)
<b>Buy</b>	17	41.69	5.452
<b>Sell</b>	3	-13.09	-0.335

## 4. BPS Part D: Transmission Constraint Management and Reserve/Response Principles

We employ a number of principles for the management of transmission constraints and response/reserve holdings. These include outage planning from year ahead to day ahead, security studies, constraint cost forecasting and negotiating Balancing Service contracts. BPS Part D also describes the calculation of response and reserve holding levels, allocation of holdings with due regard to cost, delivery dynamics and transmission constraints, and regaining levels of response holding following delivery.

**We have managed transmission constraints and response/reserve holdings during this reporting period in line with the principles described in BPS Part D.**

## 5. **BPS Part E: Day Ahead and Within Day Balancing Processes**

BPS Part E describes the Day Ahead and Within Day balancing processes – the Scheduling and Control phases. At the Day Ahead stage, this includes publishing day ahead demand forecasts, performing security studies, calculating reserve/response levels and calculating half hourly system plant margins. It also includes forecasting constraint costs, calling off Balancing Service contracts and revising the national and zonal margin data.

Within Day, it includes releasing revisions to the demand forecasts and margin data to the Balancing Mechanism Reporting System, performing additional security studies, reassessing the need to call off Balancing Service contracts, and balancing the system minute by minute through the deployment of Balancing Services on an economic basis.

**We have managed the Day Ahead and Within Day balancing processes during this reporting period in line with the principles described in BPS Part E.**

## 6. **BPS Part F: Summary of GB Operational Security Standards**

BPS Part F summarises the Operational Security Standards used by National Grid. We operate the system within these standards in order to maintain system security. The system is normally secured against certain specific “secured events” which are defined in Part F – for example the fault outage of a double circuit overhead line.

We have planned and operated the GB Transmission System to a single GB Security and Quality of Supply Standard (GB SQSS).

**Loss of supply and frequency or voltage excursions outside statutory limits are reported separately in accordance with Standard Condition C17 of the Transmission Licence.**

## 7. **BPS Part G: Exceptions to the BPS**

Infrequently, circumstances may arise which require us to operate outside the principles described in the BPS. The specific examples identified in BPS Part G are:-

- (i) Black start
- (ii) System islanding
- (iii) When emergency control centre evacuation procedures have been invoked or widespread communication problems
- (iv) Circumstances where operating within the BPS would prejudice the safe and secure operation of the system
- (v) Insufficient time available to balance the system in accordance with the BPS
- (vi) Where the BPS is inappropriate and awaiting modification.

**Actions were taken as described in the subsections above to ensure the safe and secure operation of the transmission system, to avoid breaching our statutory obligations or where insufficient time was available to employ alternative measures to achieve balancing.**

## 8. Future Reports

BPS reports are prepared by National Grid in accordance with the timetable set out in our Transmission Licence Standard Condition C16.

This report covers the period from 1 October 2007 to 30 September 2008.

For further information on this report please contact:

Business Assurance Manager

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## Appendix 1 – Overview of the Balancing Principles Statement

### I The Purpose of the Balancing Principles Statement

The BPS has been developed by National Grid to assist electricity market participants to understand our actions in achieving the efficient, economic and co-ordinated operation of the transmission system.

National Grid is required by Transmission Licence Standard Condition C16 section 5 to establish and maintain a BPS to define the broad framework within which we make balancing action decisions.

### II Changes to the BPS

The BPS is approved by OFGEM and may only be modified in accordance with the processes set out in Standard Licence Condition C16.

Where changes are required to the BPS in advance of the annual update then, subject to approval, a BPS supplement may be issued.

The latest version of the BPS is version 8.0 issued on 1st April 2008. The changes to this version were due to the annual review of the BPS.

### III Further information

Copies of the BPS are available from the National Grid website.

<http://www.nationalgrid.com/uk/Electricity/Balancing/transmissionlicensestatements/>

For further enquiries relating to the BPS, please contact:

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## Appendix 2 – Review opinion by PricewaterhouseCoopers