Appendix C– Indicative Changes to C16 Statements

Procurement Guidelines

Balancing Principles Statement

Applicable Balancing Services Volume Data Methodology Statement

Balancing Services Adjustment Data Methodology Statement

System Management Action Flagging Methodology Statement

Procurement Guidelines

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Version Control

Date	Version No.	Notes
20.03.01	1.0	Initial version
21.09.01	1.1	Revision to initial version to incorporate new intentions on the procurement of Fast Reserve
01.05.02	2.0	Annual revision incorporating updates to information provision and Licence Condition references
01.05.03	3.0	Revision following annual review
28.11.03	3.1	Revision to incorporate introduction of Maximum Generation Service, POT, and the development of demand side services.
01.05.04	4.0	Revision following annual review
04.10.04	4.1	Revision to incorporate changes as a result of CAP071: the development of Maximum Generation Service
01.01.05	4.2	Revision to incorporate changes relating to BETTA
15.07.05	4.3	Revision to incorporate changes as a result of CAP076: Treatment of System to Generating Intertripping Schemes
02.09.05	5.0	Revision to incorporate changes relating to the provision of warming data; and the informal annual review
06.04.06	6.0	Revision following annual review
01.11.06	7.0	Revision to incorporate the replacement of the Warming & Hot Standby service with BM Start Up service

Date	Version No.	Notes
01.04.07	8.0	Revision to incorporate Short Term Operating Reserve (STOR)
01.04.09	9.0	Revision following annual review
01.04.11	10.0	Revision following annual review
01.04.13	11.0	Revision following annual review
date	XX	Revision to incorporate changes for Supplemental Balancing Reserve and Demand Side Balancing Reserve

The Guidelines have been developed in consultation with the Authority. The Guidelines may only be modified in accordance with the processes set out in Standard Condition C16 of National Grid's Electricity Transmission Licence. We will continuously monitor the validity of the Guidelines and intend, in discussion with the Authority, to periodically review the form of the Guidelines and, where appropriate, make such revisions as are necessary.

In the event that it is necessary to modify the Guidelines in advance of issuing the annual updated version of this document, then this will be done in accordance with Standard Condition C16.

The latest version of this document is available, together with the relevant change marked version (if any), electronically from our website http://www.nationalgrid.com/uk/Electricity/Balancing/transmissionlicencestatements/

Alternatively a copy may be requested from:

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CONTENTS

PART A: INTRODUCTION

1. Purpose of Document

This document sets out the Procurement Guidelines ("the Guidelines") which National Grid Electricity Transmission plc (NGET) is required to establish in accordance with Standard Condition C16 of National Grid's Electricity Transmission Licence. The purpose of these Guidelines is to set out the kinds of Balancing Services which we may be interested in purchasing, together with the mechanisms by which we envisage purchasing such Balancing Services.

The Guidelines are not prescriptive of every possible situation that we are likely to encounter, but rather represent a generic statement of the procurement principles we expect to follow.

The remainder of this document is structured in four parts. Part B sets out the broad definitions of Balancing Services, the general principles we expect to follow in procuring such services, the relationship between various Balancing Services and a description of actions that will be taken outside of the Balancing Mechanism (BM). Part C describes the kinds of Balancing Services we expect to procure and Part D sets out the procurement mechanisms we expect to utilise in procuring such Balancing Services. Part E contains historical Balancing Services volumes and describes other information we will provide to ensure that appropriate signals are available to market participants and other interested parties.

In the event that it is necessary to modify the Guidelines in advance of issuing the annual updated version of this document, then this will be done in accordance with Standard Condition C16 of the Electricity Transmission Licence.

The Guidelines have been developed in consultation with the Authority and Industry Participants. The Guidelines may only be modified in accordance with the processes set out in Standard Condition C16 of National Grid's Electricity Transmission Licence. We will continuously monitor the validity of the Guidelines and intend, in discussion with the Authority, to periodically review the form of the Guidelines and, where appropriate, make such revisions as are necessary.

The Guidelines make reference to a number of definitions contained in the Grid Code and Balancing and Settlement Code. In the event that any of the relevant provisions in the Grid Code or Balancing and Settlement Code are amended, it may become necessary for us to modify the Guidelines in order that they remain consistent with the Grid Code and/or Balancing and Settlement Code.

In any event, where our statutory obligations or the provisions of the Grid Code are considered inconsistent with any part of these Guidelines, then the relevant statutory obligation and/or Grid Code provision will take precedence.

Unless defined in the Guidelines, terms used herein shall have the same meanings given to them in the Electricity Transmission Licence, the Grid Code and/or the Balancing and Settlement Code as the case may be.

The latest version of this document is available electronically from our website. Alternatively a copy may be requested from the Head of Commercial Frameworks - Electricity. Full contact details are set out in Part E of this document.

PART B: GENERAL PRINCIPLES

1. Balancing Services

The services that we need to procure in order to operate the transmission system constitute Balancing Services.

The Transmission Licence defines Balancing Services as:

(a) Ancillary Services;

(b) Offers and Bids made in the balancing mechanism; and

(c) other services available to the licensee which serve to assist the licensee in co-ordinating and directing the flow of electricity onto and over the GB transmission system in accordance with the Act or the standard conditions and/or in doing so efficiently and economically, but shall not include anything provided by another transmission licensee pursuant to the STC.

Ancillary Services:

These services are described in Connection Condition 8 of the Grid Code and are services procured from Authorised Electricity Operators (AEOs) or persons that make interconnector transfers. These services can be mandatory or commercial in nature. They are not procured from electricity consumers.

Balancing Mechanism Offers and Bids:

These are commercial services offered by generators and suppliers and procured through arrangements set out in Paragraph 5.1, Section Q of the Balancing and Settlement Code. They represent a willingness to increase or decrease the energy output from Balancing Mechanism Units (BMUs) in exchange for payment. Accepted services are used to control the national and local balance of generation and demand.

"Other Services":

These are commercial services that can be entered into with any party, which are classified neither as Ancillary Services nor as BM Offers and Bids. These services can be provided by parties who are not AEOs. This category would include any service provided by parties that are not signatories to the Balancing and Settlement Code. Other Services may also include the procurement of energy for balancing purposes. Further details on 'Other Services' can be found in Part C.

2. Procurement Principles

When procuring Balancing Services, we will apply the following principles.

- Without prejudice to the factors below and after having taken relevant price and technical differences into account, we shall contract for Balancing Services in a non-discriminatory manner.

- In contracting for the provision of Balancing Services we will purchase from the most economical sources available to us having regard to the quality, quantity and nature of such services at that time available for purchase.

  The types of issues considered with regards to quality and nature are best explained via an example. When considering a requirement for frequency response from two potential providers we will have regard to the quality, quantity and nature of frequency response available for purchase. In assessing the quality of the service we will consider, for example, the historical performance of the provider. In assessing the nature of the service we will consider, for example, whether the nature of the provider's frequency response service is dynamic or static.

- Where there is, or is likely to be, sufficient competition in the provision of a Balancing Service we will seek to procure that service via an appropriate competitive process (identified in Table 1) or market mechanism, as described in Part D of this document. In such instances we shall provide a statement[1] indicating the processes and terms under which contracts will be awarded. Copies of these statements are available from the Information Provision Contact listed in Part E of this document.

- If we consider that there is insufficient competition in the provision of a Balancing Service (e.g. where there is some form of local monopoly) we shall contract for such provision on a negotiated bilateral basis.

- If Balancing Services are required over a relatively long term, we shall advertise that requirement as appropriate through the communication media set out in Part D of this document.

- If a third party requires Balancing Services, and if we secure provision of such services on their behalf, the associated costs of provision will be fully recharged to the party requiring such services.

3. Balancing Services Relationships

Both Ancillary Services and "Other Services" will be procured against the principles set out in this statement. It should be recognised that the volume of services procured will be constrained by economic and technical factors, including the level and nature of services delivered through BM Offers and Bids.

[1] "statement" will be a hyperlink to an appropriate index page on our web-site.

Offers and Bids within the BM will be accepted in price order, after taking account of system technical limitations and dynamic parameters associated with the Offers and Bids. Taking account of these constraints, when all available Offers and Bids that can be accepted have been exhausted, emergency action may need to be initiated. Ancillary Services and "Other Services" can be considered collectively as services procured outside the BM. We will need to procure Ancillary Services and "Other Services" for:

- System Security - Services may be procured outside the BM if we consider that there will be insufficient Offers and Bids available within the BM to balance the system and maintain security of supply.

- Cost - Services may be procured outside the BM if we consider that it would provide an economic alternative to purchasing services through the BM.

- Differentiation - Services may be procured outside the BM if the required technical characteristics are not available through BM Offers and Bids.

4. Taking Actions Outside the Balancing Mechanism

Our consideration of whether to undertake actions within or outside the BM will be based on a forecast of the level and cost of services expected to be available within the BM. 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. The principles by which we will forecast the

sufficiency or otherwise of Offers and Bids in the BM–, and technical characteristics, are set out in the Balancing Principles Statement.

When considering what actions will be undertaken outside the BM or what actions will be taken before Gate Closure it is useful to examine energy related products separately from Other Services, in addition to Ancillary Services.

- Ancillary Service Agreements are normally entered into prior to Gate Closure such that prices and service capability are agreed well before they are exercised. Typically, Ancillary Service Agreements provide for the services to be exercised within Gate Closure timescales and for payments to be made in addition to those made within the BM. An example of this type of payment is the Frequency Response capability payment which is contracted for in advance and then made when a provider is placed in a state where it is capable of deviations in its output as a result of deviations in system frequency.

- In the case of Balancing Services not provided by AEOs, agreements are again normally entered into prior to Gate Closure. These services are exercised within Gate Closure timescales, but the providers will often not be a Trading Party within the Balancing and Settlement Code. An example of this is the provision of Frequency Response services from the demand side. This results in the contract being entirely outside the BM.

- For energy we will trade, subject to any restrictions set out in the Transmission Licence, using the same instruments as other traders. For example we will enter into agreements prior to Gate Closure to pay a provider an option fee to ensure that energy is available in the BM. This option may then be exercised prior to or after Gate Closure.

- Where standard energy related products do not provide for our specific requirements, we will seek to amend the standard trading instrument by agreement. For example, for the provision of a MW profile from a specific BMU provider, we may choose to use a Pre Gate Closure BMU Transaction (PGB Transaction) or a Grid Trade Master Agreement Schedule 7A transaction to ensure that energy is delivered according to that MW profile. This could be used to synchronise or desynchronise BMUs with dynamics that extend outside the BM.

PART C: BALANCING SERVICES REQUIRED

1. Types of Balancing Services

We are interested in procuring the following types of Balancing Services:

Ancillary Services

- System Ancillary Services (Part 1), the mandatory services required to be provided by all licensed generators, of:
  - Reactive Power; and
  - Frequency Response.

- System Ancillary Services (Part 2), the necessary services required from some generators and provided if agreement is reached, of:
  - Black Start Capability;
  - Fast Start Capability; and
  - System to Generator Operational Intertripping

- Commercial Ancillary Services. The following services, required from some generators and provided if agreement is reached, of:
  - Constraint Management Services;
  - Enhanced Reactive Service;
  - Commercial Frequency Response Service;
  - Reserve Services; comprising:
    - Fast Reserve;
    - Short Term Operating Reserve; and
    - BM Start -up.
  - Commercial Intertrips;
  - Commercial Fast De-load Service;

System-to-System Services (including Emergency Assistance);
Maximum Generation Service; and
Transmission Related Agreements.

Other Services

Other Services, other than those provided as an Ancillary Service, comprise:

- Reactive Power;
- Frequency Response;
- Short Term Operating Reserve;
- Fast Reserve; ~~and~~
- Demand Intertrip
- Demand Side Balancing Reserve; and
- Supplemental Balancing Reserve.

Energy Related Products, comprising of:

- Forward Energy Trades;
- Power Exchange Trades;
- Energy Balancing Contracts.

A number of services are listed under both Ancillary Services and Other Services. This distinction arises from the definition of Ancillary Services in the Transmission Licence, which defines Ancillary Services as being provided by AEOs or interconnector parties. Thus where parties that are not AEOs provide a service, such as frequency response, then it is classified as an Other Service rather than an Ancillary Service.

2. Description of Balancing Services

2.1 Ancillary Services

There are two broad types of Ancillary Service, as defined in the Grid Code.

System Ancillary Services, which are divided into two parts, comprise Part 1 System Ancillary Services that are mandatory services required from all licensed generators and Part 2 System Ancillary Services that are necessary services provided by some generators, on a site by site basis, to meet specific system requirements where agreement is reached. Any Ancillary Service which is not a System Ancillary Service and which is provided by an AEO is termed a Commercial Ancillary Service.

System Ancillary Services comprise the services as set out in and described in Connection Condition 8.1 of the Grid Code:

- All licensed generators are required to provide Part 1 System Ancillary Services to ensure the provision of a minimum technical capability to deliver voltage and Frequency Response services.

- Some generators are required to provide the Part 2 System Ancillary Services of Black Start Capability and/or Fast Start Capability. Our additional requirements for these services depend on the actual and expected provision of such services by existing providers.

  Additionally, some generators will be required to provide System to Generator Operational Intertripping Schemes as a condition of connection.

  Future Requirements

We are interested in discussing arrangements with potential new providers of the Black Start Capability service. However, there is no requirement for any additional Fast Start Capability beyond the current provision from all existing providers. Requirement for System to Generator Operational Intertripping Schemes will be dependent upon future system development and new connections to the Transmission System.

Commercial Ancillary Services, described in Connection Condition 8.2 of the Grid Code, are agreed bilaterally and set out, subject to satisfactory commercial terms, in an Ancillary Services Agreement. The Commercial Ancillary Services we expect to procure are:

- Enhanced Reactive Power Service - which exceeds the minimum technical requirement set out in Connection Condition 6.3.2 of the Grid Code. We will contract for such services as described in the relevant Reactive Power market arrangements (see Part D) and in accordance with Schedule 3 of the CUSC.

- Commercial Frequency Response Service - which provides for combinations of different technical characteristics (compared to mandatory frequency response services), together with alternative pricing arrangements. We contract for such services when the anticipated cost is lower than the alternative service provision.

- Reserve Services - these are instructed services required over a variety of time frames to deal with the matching of generation with demand. The services we expect to procure can be broken down into the following components:

- Fast Reserve – which is a fast acting, reliable, flexible service, provided by plant capable of increasing energy production or

reducing energy consumption, at defined rates and within a defined time period. The details of this service will be described in the detailed statements associated with its procurement via tender (see Part D).

- Short Term Operating Reserve (STOR)- which is provided by either increasing generation to the system, reducing demand or a combination of both in defined timescales. The details of this service will be described in the detailed statements associated with its procurement via tender (see Part D).

- BM Start-up - Which is a service that allows National Grid to access MW from BM Units that would not otherwise have run, and are unable to start-up within BM timescales on the day. Firm payments for this service are made on a £/h basis, to remunerate the costs of preparing a BMU to start up and synchronise within BM timescales.

- Commercial Intertrip - this service is required to minimise the pre transmission line fault output restrictions that may apply to Power Stations. This service is the same as a normal intertrip with the exception of the generator not being obliged to provide the service as part of its connection conditions.

- Commercial Fast De-Load Service - this service is required to minimise the pre transmission line fault output restrictions that may apply to Power Stations. This service is like Intertrip, apart from instead of sending a trip signal directly to a generator breaker the signal goes to the generator and initiates a ramp down to zero output in a set time. If the generation has not reduced within the set time a trip signal will then be sent to the generator breaker to trip the generator.

- Constraint Management Services – these services are required when there is a transmission constraint. A transmission constraint as defined in NGET's transmission licence: means any limit on the ability of the electricity transmission system, or any part of it, to transmit the power supplied onto the national electricity transmission system to the location where the demand for that power is situated, such limit arising as a result of any one or more of:

  a) the need not to exceed the thermal rating of any asset forming part of the national electricity system;
  b) the need to maintain voltages on the national electricity transmission system; and
  c) the need to maintain the transient and dynamic stability of electricity plant, equipment and systems directly or indirectly connected to the national electricity transmission system.

  The technical requirements for such a service will be specific to the location of the constraint and will be defined in the relevant Commercial Services Agreement.

- System-to-System Services (including Emergency Assistance) - these services provide for mutual support of the transmission system with other interconnected systems. These services are only required via interconnectors.

- Maximum Generation Service – this service is required to provide additional short term generation output during periods of system stress for system balancing. This service allows access to unused capacity outside of the Generator's normal operating range. This service will be initiated by the issuing of an Emergency Instruction in accordance with the Grid Code BC2.9.2, Section 4 of the CUSC and the Maximum Generation Service Agreement.

- Transmission Related Agreements - where connection arrangements result in a requirement for the output of a generator to be constrained due to events on the transmission system the commercial process is managed via a Transmission Related Agreement.

2.2 Other Services

As indicated in Part B, “Other Services” include services which are not classified as “Ancillary Services”, but technically can provide the same effect from different service providers. An example of “Other Services” would be Frequency Response provided by an electricity consumer (a party that is not an AEO).

Other Services may also include the purchases/sales of energy in connection with operating the transmission system and/or doing so economically and efficiently. Purchases/sales via bilateral forward contracts or through a recognised exchange will fall within this category. This includes PGB Transactions. The levels of procured energy will be included in the Balancing Services Adjustment Data (BSAD) which is submitted to the Balancing Mechanism Reporting Agent in line with the BSAD Methodology Statement for inclusion in the calculation of System Sell Price and System Buy Price in accordance with the Balancing and Settlement Code. Demand Side Balancing Reserve and Supplemental Balancing Reserve are also examples of Other Services.

2.3 Prohibited Activities

We have been given discretion with regard to the procurement of Balancing Services, subject to a licence obligation to operate the transmission system in an efficient, economic and co-ordinated manner and under the umbrella of an incentive scheme.

We should be able to make the best use of the range of tools available to us including (but not limited to) energy contracts and option contracts called both inside and outside of the BM.

In addition to the licence obligation to operate the transmission system in an efficient, economic and co-ordinated manner, we are also prohibited from purchasing or otherwise acquiring electricity except pursuant to the procurement or use of Balancing Services in connection with operating the transmission system and doing so economically and efficiently (or with the consent of the Authority) with the result that we are prohibited from speculative trading.

In addition we are required to publish a range of information to market participants in relation to how we envisage procuring Balancing Services and energy purchases. Full details of the range of information that we will publish and details on where this information can be found on our web-site.

2.4 Buying Energy or Selling Energy Related Contracts

Reasons why we may buy or sell energy or energy related contracts forward include:

- To meet our mean forecast requirement for balancing energy.

- To provide options to meet potential variations from the mean forecast. The Reserve Services described above may fulfil this requirement.

- To reduce the total cost of balancing the transmission system using the BM. For example, if a certain volume of Offers are forecast to be required in the BM (e.g. for the purposes of establishing spinning reserve), it may be more

economic to purchase a volume of energy forward such that a reduced volume of Offers and Bids are required.

- Direct Arbitrage between different balancing instruments in order to yield a lower overall balancing cost. In order to comply with the Transmission Licence, this would only be valid if an immediate cost saving can be obtained by directly replacing one balancing instrument to fulfil a specific requirement with another which replaces the same requirement. An example of such a direct arbitrage could be to sell a 12-month contract and replace it with 2 consecutive 6-month contracts.

3. Demand Side Providers and Small Generators

We are interested in procuring Balancing Services from demand side providers subject to technical and dynamic considerations (where demand side providers, include demand reducers, demand increasers and small generators embedded on site).

Demand side providers provide 'Other Services' as defined in section 2.2 above. The types of Balancing Services that we are interested in procuring from demand side providers are the same as shown in the list of 'Other Services' provided in Part C, section 1.

Demand side providers are encouraged to participate in the standard market tender process we use to procure the following services (subject to meeting the minimum technical criteria):

- Reactive Power;
- Fast Reserve;
- Short-Term Operating Reserve (STOR)
- Firm Frequency Response

- Demand Side Balancing Reserve (DSBR)

We are also interested in entering into bilateral contracts with demand side providers for the following services (again subject to meeting the minimum technical criteria):

- Frequency Response – provision of non-dynamic response via frequency relay initiated response;
- Fast Reserve – for demand side providers who are unable to participate in the standard market tender arrangements;
- Demand Intertrip – used to assist in maintaining local system security;
- BM Offers and Bids; and
- Energy Related Products.

Bilateral contracts with demand side providers are procured by the same means as for any other provider.

We are always interested in entering into bilateral discussions with demand side providers for the provision of specialised services where demand side characteristics preclude participation in our standard market tender processes, or there are enhanced services that can be provided.

We are interested in entering into discussions with the demand side about developing new services or market processes. Typically, we would develop new services through the use of contract trials in order to assess the service requirement, dimensions. Once proven, and where appropriate, the service details and procurement mechanism will be reflected in a modification to these Guidelines. Examples of those services that may potentially bedeveloped further are:

- Fast Reserve by Tele switch control of meters
- Demand Management

PART D: PROCUREMENT MECHANISMS

1. Procurement Process

As indicated in Part B of these Guidelines, where sufficient competition exists, we will seek to contract for Balancing Services via some form of market mechanism. In other circumstances, bilateral contracts will be entered into with the service providers. In all such circumstances we will be mindful of our Licence obligations when entering into these agreements.

Market mechanism

This will normally be a tender based process for the selection and award of service contracts. In each case, the mechanism will include:

- a statement of our service requirements;
- the issuing of invitation to tender documentation, providing sufficient information to allow the provision of a service offer to be made, including standard contract terms and conditions;
- arrangements for governance of the process;
- a statement of principles and criteria that we will consider when evaluating the awarding of contracts; and
- a report providing information on previous tenders.

Schedule 3 of CUSC contains the market mechanism arrangements for Reactive Power. This information is supplemented by other information available on our web-site. The information noted above may be requested from the Head of Commercial Frameworks - Electricity. Full contact details are set out in Part E of this document.

Bilateral Contracts

Bilateral contracts may be required where limited competition exists in the supply of a service (taking into account locational factors where

necessary). This may be due to special technical requirements of the desired service, where some form of monopoly exists or the unique characteristics of certain individual providers.

Where we consider there to be a limited degree of competition, we will

- contact those service providers we believe to be capable of providing the required service or who have expressed an interest in providing the service in order to establish whether they wish to enter into a contract for the service in question; and
- offer non-discriminatory terms for the acquisition of the service.

However, if there is insufficient time to identify and contact other providers, we reserve the right to contract as appropriate to meet system security requirements.

Where we consider that no competition exists (such as the provision of a locational service), we will offer non-discriminatory terms for the acquisition of the required service.

2. **Procurement Communication Media**

We shall communicate any service requirement by contacting those parties that we believe may be interested in providing the service, including any existing or past service providers, and anyone that has expressed a prior interest in providing such services in the future. In addition, notification of tenders will normally be advertised in trade magazines as appropriate and via our web-site.

3. **Procurement Summary**

This summary Table 1 sets out the Balancing Services we expect or intend to procure and the mechanisms by which we expect to procure them. It also sets out the timescales over which we intend to procure those Balancing Services set out in Part C, section 1 of these Guidelines.

Table 1 BALANCING SERVICES SUMMARY TABLE

ANCILLARY SERVICES	MEANS OF PROCUREMENT	TIMESCALES
Part 1 Services		
Reactive Power	Mandatory Services Agreement pursuant to the CUSC	Evergreen
Frequency Response	Mandatory Services Agreement pursuant to the CUSC	Evergreen
Part 2 Services		
• Black Start	Bilateral contracts	Up to life of asset
• Fast Start	Bilateral contracts	Up to life of asset
• System to Generator Operational Intertripping	Entered into pursuant to the CUSC	Up to life of asset
Commercial Ancillary Services		
Constraint Management Services	Bilateral Contracts or Contracts derived from market tenders	As required
Enhanced Reactive Services	Contracts derived from Market tenders or bilateral contracts	Min Annual
Frequency Response	Bilateral contracts or contracts derived from market tenders	Min monthly via bilateral contract or tender process
Reserve		
• Fast Reserve	Bilateral contracts or contracts derived from market tenders	Min monthly via bilateral contract or tender process
• STOR	Contracts derived from Market tenders.	As required via tender process
• BM Start Up	Bilateral contracts	Evergreen
• Commercial Intertrip	Bilateral contracts or Contracts derived from market tenders	As required
• Commercial Fast De-load	Bilateral contracts or Contracts derived from market tenders	As required

• System to system services including Emergency Assistance	Bilateral contracts	Evergreen
• Maximum Generation Service	Bilateral contracts entered into pursuant under CUSC	As required
BALANCING MECHANISM OFFERS AND BIDS	Services are procured under the provisions of the Balancing and Settlement Code	N/A
OTHER SERVICES		
Reactive Power	Contracts derived from Market tenders or bilateral contracts	Min Annual
Frequency Response	Bilateral contracts	Min Seasonal
STOR	Contracts derived from Market tenders	As required
Fast Reserve	Bilateral contracts or contracts derived from market tenders	Min monthly via bilateral contract or tender process
DSBR	**Bilateral contracts derived from market tenders**	Annual tender supplemented by seasonal top-ups as required
Supplemental Balancing Reserve	**Bilateral contracts**	As required
ANCILLARY SERVICES	**MEANS OF PROCUREMENT**	**TIMESCALES**
Demand Intertrip	Bilateral contracts	As required
Energy Related Products	Procured via Markets/Bilateral contracts	As required

PART E: INFORMATION PROVISION

1. General Provisions

We shall publish information on the Balancing Services that we intend to procure. In doing so we will seek to provide market participants and other interested parties with sufficient information without compromising the commercial position of any contracting party.

As part of the provision of information we will provide BSAD. The calculation methodology used is set out in a separate document entitled "BSAD Methodology Statement" established by The National Grid Electricity Transmission plc under the Transmission Licence.

2. Information Provision Contacts

All queries regarding the provision of Balancing Services we intend to procure should be made, in the first instance, to:

Head of Commercial Frameworks - Electricity
National Grid
National Grid House
Warwick Technology Park
Gallows Hill
Warwick CV34 6DA

Email: BalancingServices@nationalgrid.com

3. Information Provision Detail

In the circumstances where tenders are held we publish information on the outcome of these processes via market reports, which are available on our web-site. This is currently the case for Reactive Power (every

six months), STOR (as required), Fast Reserve (monthly) and Firm Frequency Response (monthly). In addition information will also be published for Maximum Generation Service on a disaggregated basis.

4. Volumes of Balancing Services

Cost and Volumes of Balancing Services procured can be found in the Annual Procurement Report at the following link http://www.nationalgrid.com/uk/Electricity/Balancing/transmissionlicencestatements/ .

5. Information Provision Summary

Table 2 sets out the information on Balancing Services that we will make available to market participants and other interested parties. A number of services set out in Table 1 have been aggregated in Table 2 to ensure that we provide market participants and other interested parties with sufficient information without compromising the commercial position of any contracting party.

Table 2 sets out the volume and price information we are able to make available and the timescales over which the information will be updated. In many cases the information will be provided pursuant to the BSAD Methodology Statement. In addition Table 2 sets out the source of the information, Hard copies of this information may be requested from the Head of Commercial Frameworks - Electricity. Full contact details are set out in section 2 above.

6. Future Developments

Information provision in the future will be integral to the development of new services and will follow the following principles :

- Information in relation to balancing activities undertaken by National Grid Electricity Transmission plc will be made available if it helps the efficient operation of the wider market;

- Ex-ante information will be made available if it helps the market to be in a position to balance without SO intervention; and
- Information will be made available to all parties at the same time, on an equal basis without discrimination or favour.

In conjunction, National Grid Electricity Transmission plc will aim to ensure that:

- Information transparency does not undermine an individual party's commercial confidentiality;
- Provision of information does not result in the SO becoming a 'distressed buyer;
- Information will not highlight where the SO has a locational specific constraint ;and
- any benefit to the wider industry from the provision of increased information should justify the costs of its provision.

7. Disclaimer

All information published or otherwise made available to market participants and other interested parties pursuant to these Procurement Guidelines is done so in good faith. However, no warranty or representation is given by National Grid Electricity Transmission plc , its officers, employees or agents as to the accuracy or completeness of any such information, nor is any warranty or representation given that there are no matters material to any such information not contained or referred to therein. Accordingly, no liability can be accepted for any error, misstatement or omission in respect thereof, save in respect of a misrepresentation made fraudulently.

TABLE 2: Balancing Services Information Provision Summary

Balancing Service	*Volume information*	*Price information*	*Timescale*	*Information Source*
Reactive Power	Historical utilisation figures set out in Reactive Power Market Report.	Default utilisation prices set out in CUSC Schedule 3, Part 1.	Invitation To Tender issued every 6 months.	Invitation To Tender available on our website.
	Utilisation volumes per BM Unit in the Reactive Power Market Report.	Full successful tender details by BM Unit in Reactive Power Market Report.	Market Report published every 6 months after each tender round (as set out in CUSC).	Market Report available on our website.
	Utilisation data on a lead and lag basis per BM Units.	Contractual information, including price, capability, commencement and term.	Information updated in line with Market Report.	Utilisation and contractual information to be available on our website.
	Reactive Power capability requirement index.		Index published from Tender Round 9 (i.e. contracts starting 1 April 2002, tender pack issued Sept/Oct 2001)	Index contained in the Reactive Power Invitation To Tender which is available on our website.

Balancing Service	*Volume information*	*Price information*	*Timescale*	*Information Source*
Frequency Response	Primary, secondary and high frequency response volume requirement curves and tables to indicate system need.	Part 1 System Ancillary Service – Holding rates for primary, secondary and high frequency response. Tendered Commercial Frequency Response - Price of tendered primary, secondary, and high frequency response.	Part 1 System Ancillary Service - Prices will be published monthly . Tendered Commercial Frequency Response – Prices will be published when tenders are received. System response volume requirement tables will be published monthly Requirement curves will be updated annually.	Primary, secondary and high frequency response prices, requirement curves, and tables are available on our website.
	MWh of Primary, Secondary and High Frequency Response held in each day of the Utilisation Month	The volume of response held will be broken down on a BMU basis	Response volumes will be published monthly.	Primary, secondary and high frequency response volumes are available on our website.
	Assumed Utilisation volumes (summed for all BM Units)	Total Imbalance Compensation (payment to all generators across the month)	Assumed utilisation and total imbalance compensation prices will be published monthly.	Assumed utilisation and total imbalance compensation prices will be published on our website.
STOR	Tendered volume and contracted volume from the latest tender round. System Reserve	Tender price information	STOR Market Information Report updated after each tender round.	All Information will be contained within the Market Information Report available on National Grid's Industry Information website.

Balancing Service	*Volume information*	*Price information*	*Timescale*	*Information Source*
	Requirements, and contracted volume from previous tender rounds in the year will be published in advance of next tender rounds			

Fast Reserve	Indicative volume requirement by Settlement Period Historic utilisation by day and average by Settlement Period	Total historic volume reported by three price bands (Bids and Offers)	Requirements published monthly in advance	This information will be published on our website
BM Start Up	Estimated Capacity Level (MW)	Hourly BM Start Up Payment Rate	As soon as practical after the issue of a new BM Start Up instruction, or change in status of an existing BM Start Up instruction	This information will be published via our website on a reasonable endeavours basis

Maximum Generation Service	Contracted and available volumes to be provided on an ex ante basis including the volume that is automatically guaranteed payment. Delivered volumes to be published on a ex post basis.	Price submitted in £/MWh as per the Maximum Generation Service Agreement	Information to be published at time of contract signature and updated as necessary. Information also to be provided on an ex post basis detailing aspects surrounding the utilisation of the service including instruction times, volume delivered and payments.	This information will be published on our website
Energy Products	Total MW contracted (buy and sell) pre gate closure for Each Settlement period	Total cost (buy and sell) is contained within the BSAD	BSAD will be published at 5pm D-1. Also BSAD will be published half hourly at Gate Closure.	A version of BSAD will be published at 5pm D-1 on our website. This version shows energy related costs and volumes (buy and sell) BSAD calculated in accordance with the BSAD Methodology Statement will be made available to the BMRA for publication each half hour. National Grid will make half hourly BSAD available to be published on the BMRS.

Pre Gate Closure BMU Transaction	For each Pre Gate Closure BMU Transaction, the specific BMU, volumes and price will be published.	Accepted offer will be entered on the BMRS warning screen at the time the transaction is agreed. All offers will be published as soon as practicable but at any event on a reasonable endeavours basis before the end of D+1.	The accepted offer will be displayed on the BMRS warning screen. All offers will be published on the National Grid web site.
DSBR	The quantities of DSBR procured in each utilisation price band will be published. The quantities of DSBR despatched and delivered will be published after the event.		This information will be published on our website.
Supplemental Balancing Reserve	The quantity of Supplemental Balancing Reserve procured will be published.		A notice explaining the quantity of SBR despatched will be displayed on BMRS.

Balancing Principles Statement

Effective Date: [1 April 2013]

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Version Control

Date	Version No.	Notes
20.03.01	1.0	Initial version
01.05.02	2.0	Revised to incorporate changes following March / April 2002 consultation.
01.05.03	3.0	Revision following annual review
28.11.03	3.1	Revision to incorporate introduction of Maximum Generation Service and changes to the PGBT Tender process
01.05.04	4.0	Revision following annual review
04.10.04	4.1	Revisions to incorporate changes as a result of CAP071: the development of Maximum Generation Service
01.01.05	4.2	Revisions to incorporate changes relating to BETTA
02.09.05	5.0	Revision following annual review
06.04.06	6.0	Revision following annual review
01.11.06	6.01	Revisions to incorporate the replacement of the Warming & Hot Standby service with BM Start Up service
01.04.07	7.0	Revisions to incorporate Short Term Operating Reserve (STOR)
01.04.08	8.0	Revision following annual review
01.04.09	9.0	Revisions following annual review
01.04.11	10.0	Revisions following annual review
01.04.13	11.0	Revisions following annual review
Date	xx	Revision to include Demand Side Balancing Reserve and Supplemental Balancing Reserve

This Balancing Principles Statement has been developed and approved by the Authority to assist Balancing and Settlement Code (BSC) participants in understanding our actions in achieving the efficient, economic and co-ordinated operation of the transmission system and ensuring the security of the system at all times. This Balancing Principles Statement may only be modified in accordance with the processes set out in Standard Condition C16 of National Grid's Electricity Transmission Licence. When reviewing this Balancing Principles Statement, we will provide the Authority with relevant information in relation to such review and with the relevant reports and statements in accordance with the relevant provisions of Standard Condition C16 of the Electricity Transmission Licence.

In the event that it is necessary to modify this Balancing Principles Statement in advance of us issuing the annual updated version of the document, then this will be done by issuing a supplement to the Balancing Principles Statement.

The latest version of this document is available, together with the relevant change marked version (if any), electronically from the National Grid Website; http://www.nationalgrid.com/uk/Electricity/Balancing/transmissionlicencestatements/

Alternatively, a copy may be requested from
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CONTENTS

PART F Summary of Operation of the GB transmission system from the National Electricity Transmission System Security and Quality of Supply Standard (NETS SQSS)

1. Overview
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3. Voltage Control Standard

PART G Exceptions to the Balancing Principles Statement

PART A: INTRODUCTION

1. Purpose of Document

This document is the Balancing Principles Statement which National Grid Electricity Transmission plc (NGET) is required to establish in accordance with Standard Condition C16 of the Transmission Licence. The purpose of this Balancing Principles Statement is to define the broad principles and criteria (the Balancing Principles) by which we will determine, at different times and in different circumstances, which Balancing Services we will use to assist in the efficient and economic operation of the transmission system, and also to define when we would resort to measures not involving the use of Balancing Services.

This Balancing Principles Statement is designed to indicate the broad framework against which we will make balancing action decisions.

Part B sets out a number of general principles relating to the development and application of this Balancing Principles Statement and Part C describes the broad principles by which we will utilise balancing measures. Part D describes the broad principles by which we undertake both the management of transmission constraints and response/reserve services and Part E sets out the processes that we will normally undertake at the day ahead and on the day to achieve system balance. Part F summarises our operational security standards within which we will carry out balancing measures. Part G explains exceptions to the Balancing Principles Statement, where circumstances may arise which require us to operate outside the principles detailed in previous sections.

In the event that it is necessary to modify this Balancing Principles Statement in advance of us issuing the annual updated version of the document, then this will be done by issuing a supplement to the Balancing Principles Statement.

This Balancing Principles Statement has been developed by NGET, and approved by the Authority, to assist BSC participants in understanding our actions in achieving the efficient, economic and co-ordinated operation of the transmission system. This Balancing Principles Statement may only be

modified in accordance with the processes set out in Standard Condition C16 of the Electricity Transmission Licence. We will review this Balancing Principles Statement, provide the Authority with relevant information in relation to such review and provide the Authority the relevant reports and statements in accordance with the relevant provisions of Standard Condition C16 of the Electricity Transmission Licence.

This Balancing Principles Statement makes reference to a number of provisions contained in the Grid Code and Balancing and Settlement Code. In the event that any of the relevant provisions in the Grid Code or Balancing and Settlement Code are amended it may become necessary for us to seek to modify the Balancing Principles Statement in order that it remains consistent with the Grid Code and/or Balancing and Settlement Code.

In any event where our statutory obligations or the provisions of the Grid Code are considered inconsistent with any part of this Balancing Principles Statement, then the relevant statutory obligation and/or Grid Code provisions will take precedence.

Unless defined in this Balancing Principles Statement, terms used herein shall have the same meanings given to them in the Electricity Transmission Licence, the Grid Code and/or the Balancing and Settlement Code as the case may be.

Copies of this Balancing Principles Statement are available from NGET upon request. The most recent edition (and any archived editions) will be available from National Grid's website
http://www.nationalgrid.com/uk/Electricity/Balancing/transmissionlicencestatements/

PART B: GENERAL PRINCIPLES

1 Licence Duties

This Balancing Principles Statement is written to be consistent with and to satisfy our licence obligation to "operate the Licensee's Transmission System in an efficient, economic and co-ordinated manner" and our duty under the Electricity Transmission Licence not to discriminate in our procurement or use of Balancing Services.

NGET will normally operate in accordance with the Balancing Principles Statement and compliance will be measured by two processes:

(i) Providing an annual report to the Authority on the manner in which and the extent to which we have complied with the Balancing Principles Statement and whether any modifications should be made to the Balancing Principles Statement to reflect more closely our practice.

(ii) We will be subject to an external audit to determine the extent to which we have, in using Balancing Services, complied with the Balancing Principles Statement. The audit statement will be made available to the Authority in accordance with the Electricity Transmission Licence.

Additionally we shall, if directed by the Authority, and in any event at least once a year, review the Balancing Principles Statement in consultation with BSC Parties and other interested parties likely to be affected by the Balancing Principles Statement.

2 Other Compliance Reporting

In addition to our licence duties we shall also provide a report to the Authority, either when requested, or where we become aware of any circumstances of significant non-compliance, in our use of Balancing Services.

The report will summarise the incident together with an explanation of the circumstances leading to the deviation from this Balancing Principles Statement. We shall endeavour to provide such reports to the Authority within 28 days of the request being made. Furthermore such reports shall be made available to the industry (via the Ofgem website).

3 Information Sources

We will determine what balancing measures will be employed by taking account of Balancing Mechanism Unit (BMU) data (made available on the Balancing Mechanism Reporting System (BMRS) from participants), our forecast of GB National Demand and GB Transmission System Demand (BC1 of the Grid Code details the release of this information on the BMRS), the Transmission Outage Plan (our co-ordinated schedule of transmission plant outages, details of which are made available to relevant generators and Network Operators under OC2 of the Grid Code), actual system conditions (including weather conditions) and any other relevant data as defined in BC1.4.2 (f) of the Grid Code.

4 Balancing Measures

The balancing measures available to us constitute Balancing Services. The Balancing Services are defined in Standard Condition C1 of National Grid's Electricity Transmission Licence. A detailed explanation of these Balancing Services is provided in the Procurement Guidelines.

5 Emergency Instructions

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

General Principles for Issuing Emergency Instructions

Where we identify the requirement to issue Emergency Instructions, and time permits, we will do so with due regard to the following principles:

(a) We will instruct those BMUs that are most effective in relieving the system problem;

(b) Where BMUs have a similar level of effectiveness in relieving the system problem we will select on the basis of submitted Bid-Offer Data;

(c) Where it is not possible to differentiate between the effectiveness or cost of BMUs we will instruct on the basis of:

- Effect on power flows (resulting in the minimisation of transmission losses) – BMUs that would lead to the greatest reduction in transmission losses being instructed first.
- Reserve/Response capability – BMUs with a lower response/reserve capability being instructed in preference to BMUs with a higher capability;
- Reactive Power contribution – BMUs with a lower reactive power capability being instructed in preference to BMUs with a higher capability;
- Dynamic Parameters - BMUs with more appropriate dynamic parameters being selected in preference to those with less appropriate parameters.

(d) where several BMUs have been instructed in response to an incident we will restore those units, where dynamic parameters and system conditions allow, in the reverse order of their instruction.

In the case of a BMU, Emergency Instructions may include an instruction for the BMU to operate in a way that is not consistent with the dynamic parameters, QPNs and/or export and import limits. In all cases (with the exception of the need to invoke the Black Start process or the Re-Synchronisation of De-Synchronised Island process in accordance with OC9 of the Grid Code) where we have issued an Emergency Instruction to a BM Participant, details will be posted on the BMRS and the Emergency Instruction Acceptance Data will be agreed post event.

Examples of such circumstances that may require the issue of Emergency Instructions include:

(a) **Events**

Events on the GB Transmission System or the System of another user that lead or could potentially lead to insecure system operation and for which insufficient relevant Bid-Offers are available to restore system security. The Grid Code defines an 'Event' as:

> *'An unscheduled or unplanned (although it may be anticipated) occurrence on, or relating to, a **System** (including **Embedded Power Stations)** including, without limiting that general description, faults, incidents and breakdowns and adverse weather conditions being experienced'.*

(b) **Demand Control** (detailed in OC6.5 to OC6.8)

Operating Code No. 6 (OC6) of the Grid Code is concerned with the provisions to be made by Network Operators, and in relation to Non-Embedded Customers by us, to permit the reduction of demand in the event of insufficient active power generation being available to meet demand, or in the event of breakdown or operating problems (such as in respect of system frequency, system voltage levels or system thermal overloads) on any part of the GB Transmission System.

(c) **System and Localised Negative Reserve Active Power Margin** (detailed in BC2.9.4 of the Grid Code).

BC2.9.4 details the actions that we can undertake in ensuring that:

- the sum of synchronised BMUs at all times are capable of reducing output sufficient to offset the loss of the largest secured demand on the system and
- synchronised BMUs at all times are capable of reducing output to allow transfers to and from system constraint groups to be contained within the required limits.

In both cases this action must be sustainable.

System Negative Reserve Active Power Margin

It should be noted that if the System Negative Reserve Active Power Margin (NRAPM) is not met then the resulting high frequency following the loss of the largest secured demand would not be abated.

Where we are unable to satisfy the required System NRAPM we will select (and instruct) BMUs for De-synchronising on the basis of Bid-Offer Data submitted to us.

Localised Negative Reserve Active Power Margin

If Localised NRAPM are not maintained then it may not be possible to alleviate incidences of thermal overloading, system instability and voltage problems following transmission system faults.

We will select and instruct BMUs for De-synchronising on the basis of Bid-Offer Data submitted to us and their effectiveness in restoring the Localised NRAPM to the required level.

- In the event that we are unable to differentiate between BMUs according to Bid-Offer Data and/or their effectiveness in restoring any Localised NRAPM, we will, where time permits, select BMUs in accordance with the General Principles described above.

(d) **Black Start** (Detailed in OC9 of the Grid Code)

The need to invoke the Black Start process or the Re-Synchronisation of De-Synchronised Island process in accordance with OC9.

(e) **Maximum Generation Service**

The need to request the Maximum Generation Service would normally be in order to maintain system security in the event that all valid and feasible Bids and Offers have been accepted in the BM and any Demand Side Balancing Reserve has been despatched. Where possible, the request for Maximum Generation Service will take place prior to the instruction of any measures related to Demand Control under OC6 1.2.(c), (d) or (e) of the Grid Code. Information relating to the instruction of the Maximum Generation Service will be published on the BMRS as soon as reasonably practicable.

The Maximum Generation Service will only be instructed where a BMU has been instructed to, or is generating at, its Maximum Export Limit.

For the avoidance of doubt, valid and feasible Bid and Offers are those Bids and Offers which facilitate the delivery of energy within the relevant Settlement Period. Under certain exceptional circumstances, it may be necessary to invoke the Maximum Generation Service before all valid and feasible Bids and Offers have been accepted. These circumstances may include:

(i) where the call off of available Offers would lead to an erosion of the system reserve for response below the required level;

(ii) where the acceptance of relevant Offers would lead to the depletion of reactive reserves below the required levels; and

(iii) where no other plant with suitable dynamics is available

For the avoidance of doubt, the decision to instruct the Maximum Generation Service will be taken based upon the prevailing system conditions on the transmission system. The price of other available actions offered through the BM will have no bearing upon the decision to instruct Maximum Generation Service.

(f) **Frequency Sensitivity** (Detailed in BC2.9.5 of the Grid Code)

The need to maintain adequate frequency sensitive Generating Units in accordance with BC2.9.5.

(g) **Communication Failure**

Where unplanned outages of the electronic data communication facilities or NGET associated computing facilities has occurred preventing normal BM operation.

6 Involuntary Reductions

Under certain, mainly exceptional, circumstances we may need to take actions that will involve the involuntary reduction of generation or demand before all valid and relevant BM Bid-Offers have been accepted. Relevant BM Bid-Offers are defined as those being located in the correct geographic location and/or having the required dynamic parameters to resolve the system problem in question. Reasons for such actions include:

(i) where the call off of available Offers would lead to an erosion of the system response holding below the required level. (It should be noted that an instantaneous generation loss occurring at a time of depleted response holding could lead to a frequency deviation outside of statutory limits. In the extreme case the system frequency could fall below the trigger point for automatic low frequency demand disconnection – a minimum level of 6% of total system demand)

(ii) where automatic curtailment measures have been initiated in response to an incident

(iii) where the acceptance of relevant Offers would lead to the depletion of reactive reserves below the required levels

(iv) where communication problems preclude the instruction of relevant Bid-Offers

Involuntary Reductions can arise either through our instruction (either manually or automatically) or following a system fault. Where we identify the requirement to call involuntary reductions, and time permits, we will do so with due regard to the following principles:

(a) we will instruct Network Operators whose demand is most effective in relieving the system problem;

(b) we will instruct those BMUs that are most effective in relieving the system problem;

(c) where it is not possible to differentiate between the effectiveness of Network Operators' demand (or BMUs) we will instruct those that will lead to the greatest reduction in transmission losses; and

(d) where several Network Operators (or BMUs) have been instructed in response to an incident we will instruct the restoration of demand (or BMUs), where dynamic parameters and system conditions allow, in the reverse order of their instruction.

PART C: PRINCIPLES UNDERLYING BALANCING MEASURES

1 We shall be responsible for making a forecast of 'GB National Demand' and 'GB Transmission System Demand' (as defined in the Grid Code) and the periodic release of these forecasts to the Balancing Mechanism Reporting Agent (BMRA) in accordance with the timetable specified in the BC1, Appendix 2 of the Grid Code. This data is published by the BMRA in accordance with section Q, Sub Section 6 of the Balancing and Settlement Code.

2 Having regard to information provided to us by BSC Parties (including their forecast levels of electricity demand) and to the requirements of the licensed transmission system security standards, we shall undertake operational planning for the timescales year ahead to day ahead:-

(a) for the matching of generation output (including, if achievable, a reserve of BMUs to provide a security margin sufficient to maintain an acceptable level of short term supply security) with forecast demand after taking into account:

(i) BMUs availability, flexibility, prices and submitted dynamics;
(ii) transmission system capability;
(iii) electricity delivered to the transmission system from generation which is not required to submit Physical Notification (PN) data;
~~(iii)~~(iv) Demand Side Balancing Reserve (DSBR) availability and prices; ~~-~~and
~~(iv)~~(v) any other relevant information.

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(b) to enable maintenance on parts of the transmission system.

3 We will seek to comply with the above principles in deploying all available balancing measures in order to maintain system security at all times.

4 We will achieve balancing measures through the:

(i) acceptance of Bids and Offers submitted by generation and demand to the BM ;

(ii) call off of Ancillary Service contracts;

(iii) call off of other services which serve to assist us in operating the transmission system (including, for the avoidance of doubt, DSBR and services from external system operators);

~~(iii)~~(iv) Supplemental Balancing Reserve (SBR); and

(v) instruction of Emergency Actions and other Involuntary Reductions.

In specific circumstances we will provide services to external system operators via System-to-System Services. On these occasions it is expected that we will procure Balancing Services to effect this service provision.

5 We shall call off balancing measures defined in 4(i), 4(ii) and 4(iii) in a cost order to maintain system balance. Under certain circumstances however this may not be possible. These circumstances include:

(i) urgent contingency action to restore operational standards on the transmission system;

(ii) technical constraints on the transmission system;

(iii) the observed and declared dynamic operating characteristics of available generation and demand Balancing Services;

(iv) other matters (such as those detailed in BC2.9) provided for in the Grid Code;

(v) failure of communication links; and

(vi) Services provided on Interconnector BMUs that could be operationally unacceptable to NGET, or commercially / operationally to the External Interconnected System Operator (EISO).

Once the problem in (i) to (vi) above has been contained, steps shall be taken to progressively return to a normal cost order.

Supplemental Balancing Reserve Service would normally only be called off after all valid and feasible Bids and Offers have been accepted in the BM and any valid and feasible DSBR has been called off but, where possible, prior to the instruction of any measures related to Demand Control under OC6 1.2.(c), (d) or (e) of the Grid Code. Information relating to the instruction of the Supplemental Balancing Reserve Service will be published on the BMRS as soon as reasonably practicable after it has been instructed.

For the avoidance of doubt, valid and feasible Bid and Offers and DSBR are those Bids and Offers and DSBR actions which facilitate the delivery of energy or demand reduction within the relevant Settlement Period. Under certain exceptional circumstances, it may be necessary to invoke the Supplemental Balancing Reserve service before all valid and feasible Bids and Offers and have been accepted or before all valid and feasible DSBR action have been called off. These circumstances may include:

(i) where the acceptance of available Offers or call off of DSBR would lead to an erosion of the system reserve for response below the required level;

(ii) where the acceptance of relevant Offers or call off of DSBR would lead to the depletion of reactive reserves below the required levels; and

(iii) where no other plant with suitable dynamics is available

For the avoidance of doubt, the decision to call off the Supplemental Balancing Reserve Service will be taken based upon the prevailing system conditions on the transmission system. The price of other available actions offered through the BM or from DSBR will have no bearing upon the decision to instruct the Supplemental Balancing Reserve service.

6 Treatment of BMUs Disconnected by Transmission System Faults

Rarely, following transmission system faults, BMUs may become instantaneously disconnected from the transmission system. Under such circumstances following the fault and prior to reconnection we would only issue a BOA to the affected BMUs if the trade provides immediate assistance to us in controlling the transmission system.

Following a transmission system fault which has caused disconnection, a BMU can only assist us in balancing the transmission system when:

- it is available to reconnect and return to its expected operating position in accordance with its submitted (or resubmitted) dynamics; and
- it can be reconnected to any part of the synchronised transmission system.

Under such circumstances a BOA may be issued to the BMU to delay the return to its expected operating position if the trade assists us in system balancing.

For the avoidance of doubt, in circumstances other than those described above, where a BMU submits a PN to connect to the transmission system, NGET issue a BOA (or Emergency Instruction) within BM timescales if it wishes to change the proposed time of connection of the BMU.

7 Arbitrage Trades

Only if such opportunities arise in relation to performing our balancing obligations and where an economic advantage would be gained with no detrimental impact on system security would we undertake direct arbitrage trades within the BM.

8 Beyond the Wall Actions

On occasion, NGET will issue BOAs that extend to the end of the current BM window ('the wall'). On these occasions, NGET will issue BOAs to return the BMU to its PN level in line with submitted dynamics (subject to no change in the prevailing BMU data). Further details of these circumstances are provided below.

NGET continually assess the various factors that affect system conditions. This may lead to a requirement for a continuing increase or decrease in BMU output, from its PN level, some time in the future that extends beyond the end of the current BM window ('beyond the wall'). In order to reflect the relevant BMU dynamics, NGET may be required to issue a further BOA "beyond the wall". System Conditions and special circumstances will also be taken account of in these situations.

Beyond the wall actions will be taken on a BMU specific basis, subject to the following information:

- indicative PN's
- dynamic data
- indicative Bid-Offer prices
- export and import limits
- location of BMU
- reactive capability
- frequency response performance
- system conditions
- predicted weather conditions
- Ancillary Service contracts

The intention to issue a further BOA "beyond the wall" will be communicated to the relevant BMU Control Point in cases where a current BOA has been issued that extends up to the end of the current BM window ('the wall').

The intention to issue a BOA "beyond the wall" will be based on the submitted dynamic and price data for all anticipated BOA timescales. It is assumed that all dynamics and prices remain as submitted for all anticipated BOA timescales. For the avoidance of doubt, if the intention is to extend a BOA beyond the wall, indicative prices, dynamics and PN for periods beyond the wall must not change from those that were used in assessing the requirement for the BOA.

This intention to issue a BOA "beyond the wall" will be translated into an actual BOA after the start of each applicable Gate Closure period. Prior to the BOA being issued, all BMU data will be checked against that used during the initial assessment. Any material changes made from the data used during the initial assessment will lead to a review of the requirement.

9 BOAs returning BMUs to PN (for BMUs that have been BOAed up to the wall)

Where appropriate, BMUs that have been BOAed up to the wall will be returned to PN, when the BM window has been extended by the subsequent issue of BOAs in line with submitted dynamics, provided parameters and prices have not changed as described in Section 8.

10 Pre Gate Closure BMU Transactions

PGB Transactions will be taken on a BMU specific basis and the following criteria will be used in the selection of BMUs that are potentially best able to meet the system requirements:

- indicative PN's
- relevant BMU dynamics
- specialised BMU information e.g. dynamic parameters that differ from those submitted
- transmission constraints imposed on the system
- location of BMU
- reactive capability
- frequency response performance
- previous PGB Transaction performance (this will only be a factor where reliability is of significant importance and when a decision has to be made close to Gate Closure)
- associated ancillary service contracts

Using the above information, the most suitable BMUs that fit the system requirements will be selected and contacted by telephone. An outline of the profile required will be communicated over the telephone to the selected BMUs. We will invite offers from the selected BMUs detailing the profile and price.

If system circumstances limit the timescales required for identifying and agreeing a PGB Transaction then it may be necessary to restrict the number of BMUs that we contact (for example a PGB Transaction required close to Gate Closure). In this case, the BMUs will be prioritised based on National

Grid Electricity Transmission plc assessment of the BMUs that are likely to meet the criteria with due regard to the requirements in line with the Transmission Licence obligations not to discriminate. This assessment may include anticipated prices (informed by historic Bid-Offer and PGB Transaction prices) as a prioritisation factor.

Once all offers have been received, they will be assessed against the following criteria:

- Cost ; and
- Which Offer best meets the requirements based on the criteria set out above and the requirements described in the Procurement Guidelines (Part B, Section 4).

The successful BMU(s) will be contacted by telephone and the transaction formally agreed. We will expect to receive a modified PN in line with the transaction details within 15 minutes of the transaction.

PART D: TRANSMISSION CONSTRAINT MANAGEMENT AND RESPONSE/RESERVE PRINCIPLES

The broad principles that we will normally employ for the management of transmission constraints and response/reserve holdings are detailed below. It should be noted that transmission constraint management involves an iterative process over all planning timescales with, where possible, continued optimisation of the system as updates to relevant information are received.

It should be further noted that an indication of the extent to which the transmission system is constrained can be gained from the margin information that we are required to release under OC2 and BC1 of the Grid Code.

1 Transmission Constraint Management Principles

- Outage planning for the period year ahead to day ahead will be undertaken. In developing the outage plan for the transmission system co-ordination is required with other Network Operators (where Network Operators is as defined in the Grid Code).

- We will endeavour to place outages coincident with relevant generation outages in order to minimise constraint costs.

- Security analysis studies are undertaken as appropriate to confirm system security of the total transmission system and identify constraints.

- Forecasts of constraint costs are made and the outage plan re-optimised to minimise these where possible.

- Significant changes to forecast availability of BMU and/or the transmission system may trigger a reassessment of the outage plan and where possible the outage plan will be re-optimised.

- We may negotiate Balancing Services contracts to manage the financial risks associated with potential high cost outages.

- In calculating constraints we will take account of any pre and post fault actions available in order to minimise restrictions of generation capacity.

- In resolving constraints we will call off Balancing Services on a cost basis (with due regard to the criteria set out in Part C, paragraph 5). Where services can not be differentiated on cost or flexibility the service that delivers the greatest reduction in transmission losses will be called.

- During periods of system difficulties (for example severe weather conditions) we may modify constraint limits in accordance with level of system risk. In so doing consideration of the following criteria will be given:

    (i) the likely duration of the system difficulties;
    (ii) the likely increase in probability of system faults arising from the system difficulties; and
    (iii) the impact on system security of faults deemed likely to arise as a result of the system difficulties.

2 Constraint Management Processes

In the Year Ahead timescale, transmission constraints are minimised through careful planning of transmission outages. Within the current year, transmission constraints are calculated and optimised as necessary from 9 weeks ahead, down to day ahead timescales and in the pre Gate Closure control phase. Furthermore constraints are continually monitored and optimised in real time.

2.1 Year Ahead

Throughout the year ahead planning process, NGET, generators, and other Network Operators exchange data relating to transmission system and generation outages for the following year. The content and timing of these data flows are currently specified under the OC 2 of the Grid Code.

Using a combination of this data and the NGET estimated generation merit order, NGET builds its transmission outage plan for the following plan year. In building the plan, the following principles are applied:

(i) The necessary NGET maintenance and construction programme must be accommodated.
(ii) System security must be achievable at all times.
(iii) Transmission constraints must be minimised.

Achieving these principles requires extensive security and economic studies of the planned transmission system.

Where this analysis identifies that some of the above principles cannot be met due to conflicting outage requirements, discussions take place between the parties involved to resolve the issues. The method of resolving conflicting requirements is set out in OC2 of the Grid Code.

Progress towards achievement of a final transmission operating plan is formally communicated at regular intervals throughout the planning year to generators and other Network Operators. These updates are specified under OC2 of the Grid Code.

2.2 9 Weeks Ahead down to Day Ahead

The following process is undertaken across the above timescales, the objective being to ensure system security is achieved at minimum cost whilst meeting our system maintenance and construction requirements:

Step 1- Using our forecast of demand, BMU availability/running, BMU prices and the transmission outage plan, security analysis studies are undertaken. These studies involve the running of system analysis models that can determine system voltage, thermal and stability conditions.

Step 2 - From the output of these studies system security is assessed. If security can not be achieved then the outage plan will be reviewed and revised accordingly.

Step 3 - Transmission constraint boundaries will be identified and further studies will be undertaken to calculate the limiting power flows across these boundaries.

Step 4 - At the day ahead stage, following receipt of PN data , the BM Start-up service may be called where appropriate to maintain system security of the transmission system.

Step 5 - The forecast costs of these constraints are then calculated and where necessary and possible the transmission outage plan will be revised.

2.3 Control Phase – Pre Gate Closure

In light of actual system conditions and revisions to our day-ahead forecasts, further security analysis studies will be undertaken to assess our transmission constraint requirements. Our plant requirements will also be re-assessed and suitable units requested to synchronise or de-synchronise depending on the outcome of this assessment. This will usually take the form of a BM Start-up service or in certain circumstances, as set out in the Procurement Guidelines, a PGB Transaction (see Part C Paragraph 10).

2.4 Control Phase – Real Time

System security will be continually monitored in real time through the use of 'on-line' security analysis studies based on actual system conditions. In light of these studies and actual BMU bidding, all transmission constraints will be continually reviewed and optimised to seek to ensure balancing costs are minimised.

3 Response/Reserve Holding Principles

The objectives of our response/reserve holding policy shall be to provide assurance, in so far as we are able, that reasonably foreseeable levels of generation failure, shortfall, demand forecast error and credible generation or demand loss do not cause us to invoke involuntary demand disconnection. In so doing we shall endeavour to adopt a response/reserve holding strategy that maintains the prevailing level of short-term supply security.

Initially we will use the prevailing supply security standards as a benchmark for our reserve and response policies. However we recognise that our policies may develop and change in the light of market circumstances and operational experience.

3.1 Response

Response is provided by sources that automatically react to frequency deviations and is required to manage instantaneous imbalances between generation and demand .There are three categories of response (Primary Response, Secondary Response and High Frequency Response) that we will contract for and these are defined in the Grid Code.

The magnitude of the largest infeed set against the contribution of system inertia and reaction of demand to falling frequency will determine the primary and secondary response requirement. In general, as more generation is synchronised to meet increased demand the system has more stored energy in rotating machines meaning less response is required to contain the same generation loss. Similarly, as demand increases, the absolute reduction in demand in response to falling frequency increases.

Similarly the high frequency response requirement will be determined by the magnitude of the largest secured demand and the level of system inertia.

Response can be delivered by both dynamic (or continuous) and non-dynamic (or occasional) sources. Dynamic response is delivered continuously as system frequency deviates from target and is provided by

part loaded generation. Non-dynamic response is delivered only when the system frequency reaches a set trigger point and is predominantly provided by contracted demand armed with low frequency relays.

In order that frequency can be contained within operational limits, and thereby minimise the risk of frequency falling outside of statutory limits, a minimum dynamic response requirement exists. The actual level of this minimum dynamic requirement is determined by our operational requirement to maintain the standard deviation of 5 minute spot frequency to 0.07Hz.

3.2 Reserve

Reserve is used to cover longer term imbalance between supply and demand caused by demand forecast error, plant failure, and the uncertainty associated with periods of rapid demand change. Reserve is also used to restore system frequency and response capability following a short-term loss. We have ~~four~~ six categories for system reserve which are detailed below:

(a) Contingency Reserve

This will be delivered primarily through the BM Start-up service to ensure sufficient generation is available at gate-closure to meet system demand, system security and our response and reserve holding requirements. It effectively covers for longer-term (i.e. day ahead to pre Gate Closure timescales) plant losses and demand forecasting errors.

The initial assessment for contingency requirements will be made at the day ahead and revised throughout the control phase as certainty in both demand forecasting and generation availability increases.

The requirements for contingency reserve will be based on longer-term plant loss statistics, demand forecast error DSBR and demand BMU offers.

(b) Regulating Reserve

Regulating reserve is required to cover for short-term generation losses (i.e. post Gate Closure) and demand forecasting error and will be carried on part loaded synchronised generation or demand BMUs.

It is envisaged that initially this service will be provided by BMUs that are voluntarily submitting suitable Bids-Offers to the BM or from DSBR although, if insufficient volumes of regulating reserve can be obtained in this way or it is economic to do so, ancillary service contracts may be put in place for the provision of this reserve service.

(c) Short Term Operating Reserve (STOR)

STOR is provided by contracted generation or demand reduction that can deliver reserve in short timescales. As with regulating reserve, it is required to cover for post Gate Closure plant loss and demand forecasting errors. STOR may be procured across differing timescales on an efficient basis in conjunction with consideration of wider obligations under the Electricity Transmission Licence.

Regulating reserve and STOR make up the total requirement dictated by Final Planning stage statistics and demand forecasting errors. The actual split between STOR and regulating reserve will be dictated by the economics of the provision of these services from the available sources across the relevant timescales.

(d) Fast Reserve

Fast reserve is a subset of regulating reserve and STOR, and is required for the maintenance of system frequency within operational limits. It is provided primarily by contracted generation that is capable of significantly increasing output within 2 to 5 minutes notice.

The volumes of fast reserves are determined by our operational standard to limit the number of frequency excursions outside operational limits (lasting greater than 10 seconds) below 1500 per annum.

(e) Demand Side Balancing Reserve

Demand Side Balancing Reserve (DSBR) is provided by demand reduction or behind-the-meter generation and despatched outside the balancing mechanism.

No economic assessment is undertaken of tenders from DSBR providers who do not wish to be paid a set up fee for making the service available. The quantity of DSBR from this category of service provider is therefore dependent upon the quantity of valid tenders put forward.

Where DSBR tenders are received from DSBR providers who do wish to be paid a set up fee, the quantity of DSBR procured is determined on an economic basis by reference to the Value of Lost Load, tender prices for DSBR and our assessment of expected quantity of service call-off. The economic assessment of these tenders requires an estimate of the reliability of the service. In the assessment of such DSBR tenders, the capacity of the DSBR included in a particular tender will be reduced by 25% in undertaking its economic assessment. Once it has been decided to enter into any particular DSBR contract, the capacity will be reduced by 75% for the purposes of assessing other DSBR tenders and when considering whether to procure other balancing services (including, for example Supplemental Balancing Reserve). A 75% reduction will also be applied to the capacity of DSBR with no set up fee when assessing the procurement of any other balancing services (including, for example, DSBR with a set up fee and Supplemental Balancing Reserve).

(f) Supplemental Balancing Reserve

Supplemental Balancing Reserve is not normally called off prior to other available balancing services. It is provided primarily by contracted generation (or potentially demand reduction capability).

The quantity of Supplemental Balancing Reserve procured is determined on an economic basis by reference to the Value of Lost Load, tender prices for Supplemental Balancing Reserve and our

assessment of expected quantity of service call-off. As Supplemental Balancing Reserve is normally despatched after other non-emergency balancing services (including, for example, DSBR), where practicable, the expected quantity of service call-off used for in the economic assessment of Supplemental Balancing Reserve is assessed in light of the quantity of other such services expected to be available.

3.3 Principles Relating to Response and Reserve Holding.

- We will calculate response and reserve holding levels based on the following criteria:
  (i) BMU loss statistics
  (ii) the largest generation infeed being covered
  (iii) the largest secured system demand
  (iv) demand forecast statistics
  (v) system characteristics such as inertia and load response
  (vi) judgement of levels of demand volatility/uncertainty
  (vii) judgement of levels of generation uncertainty
  ~~(ii)~~(iv) judgement of the levels of DSBR that may be delivered.

- We will allocate response and reserve holding with due regard to:
  (i) cost
  (ii) dynamics of delivery (as detailed in 3.1 and 3.2 above)
  (iii) transmission constraints

- We will not allocate response/reserve to constrained BMUs if the delivery of that response/reserve would result in violation of the constraint.

- During system difficulties (caused for example by severe weather conditions) we may strategically allocate response/reserve on a geographic basis to manage system risk. In so doing consideration will be given to the following criteria:
  (i) the likely duration of the system difficulties
  (ii) the parts of the system affected by the system difficulties
  (iii) the likely increase in probability of response/reserve holding being affected by the system difficulties

- At all times we will endeavour to maintain sufficient levels of response on the system in order that the loss of the largest generation infeed would not result in a violation of the security standards.

- Following an event that leads to the delivery of response we will, as soon as is practical, take action to regain the level of response holding on the system such that system security standards would not be violated following a further generation infeed loss. Such action includes the instructing of STOR such that responsive BMUs can be brought back to their respective response holding levels.

- We will seek to hold sufficient high frequency response on the system to ensure that security standards are not compromised should the largest secured demand on the system trip.

- In achieving the above we will seek to ensure that there is a suitable level of generation capable of reducing output on the system at all times.

PART E: DAY AHEAD AND WITHIN DAY BALANCING

1. Day Ahead Balancing Process – Scheduling Phase

Step 1 - By 09:00 hours each day we will publish our day ahead demand forecast covering the period 05:00 hours day ahead to 05:00 hours day ahead + 1.

Step 2 - By 11:00 hours we will receive PN and other data from all BMUs covering the period 05:00 hours day ahead to 05:00 hours day ahead + 1 and default such data as is necessary.

Step 3 - Using the submitted PN data, demand forecast and planned transmission outage information we will undertake security analysis studies to verify system security (Part F refers).

Step 4 - For each half hour period from 05:00 hours day ahead to 05:00 hours day ahead + 1 the system BMU + DSBR –requirement (i.e. that required to meet system demand and system response/reserve levels) is calculated from the sum of forecast demand, scheduled reserve[1], contingency reserve and STOR (less that provided by contracted non BMU sources).

Step 5 - For each half hour period from 05:00 hours day ahead to 05:00 hours day ahead + 1 the sum of BMU maximum export limits (MEL) is calculated based on the 11:00 hours PN submission.

Step 6 - The system plant margin for each half-hour period is then calculated by subtracting the identified BMU requirement from $\sum$ MEL (after accounting for BMUs likely to be restricted by constraints) and after adjusting for likely quantities of available DSBR.

Step 7 - The system plant margin for each half-hour is therefore derived from:

[1] Scheduled reserve is the total amount of headroom required to meet the level of regulating reserve and frequency response allocated to synchronised BMU.

($\sum$ MEL + $\sum$ DSBR - $\sum$ Constrained Off BMUs) – BM Unit Requirement

Step 8 - If the system plant margin is negative then we will revisit the transmission outage plan and where possible make revisions in order to reduce the level of constrained off BMUs. We will also consider whether Supplemental Balancing Reserve is likely to be required and notify SBR providers accordingly.

Step 9 - If the system plant margin remains negative we shall, dependant on the level and duration of the shortfall and the time period to the shortfall, issue the appropriate system warning to the market.

Step 10 - By 12:00 hours each day we will issue the total system plant margin data to the market for the period 05:00 hours day ahead to 05:00 hours day ahead + 1.

Step 11 - We will forecast constraint costs based on the submitted indicative PN (and other BMU) data and our estimation of Final Physical Notification (FPN) levels and Bid-Offer prices and volumes. Depending on the forecast levels of these costs we will give consideration to the cancellation/deferral of transmission system outages.

Step 12 - Where judged necessary we will seek to call off Balancing Services contracts (on a cost basis with due regard to the criteria set out in Part C, paragraph 5) to ensure, inter alia, that BMUs required to maintain system security are available for selection in the BM .

Step 13 - Following 11:00 hours we will continue to receive updated PNs from BMUs.

Step 14 - Using this updated data we will revise the national plant margin data and publish this together with zonal margin data by 16:00 hours.

2. Within Day Balancing Process – Control Phase

Step 1 - At defined times we will revise and release to the BMRA in accordance with 6.1.7 of Section Q of the Balancing and Settlement Code half-hourly averaged demand forecasts.

Step 2 - As participants become aware of changes to their physical position they will be expected to advise us of those changes.

Step 3 - At defined times, using the latest demand forecast, PN and other BMU data, the zonal and national margins will be reassessed and released to the BMRA in accordance with 6.1.7 of Section Q of the Balancing and Settlement Code. If we consider that there is a realistic possibility of a margin shortfall after taking account of the potential response to a Notice of Insufficient Plant Margin and other available Balancing Services, we will consider despatching SBR plant to make good the potential shortfall in relevant periods.

Step 4 - Using the revised data we will undertake security analysis studies and reassess the requirements for the call off of Balancing Services contracts or Other Services such as PGB Transactions.

Step 5 - At Gate Closure the PN data will become FPN data and we will have received Bid-Offer Prices and volumes for those BMUs wishing to actively participate in the BM.

Step 6 - In the BM, using the revised demand forecast and validated FPN and Bid-Offer Data, we will seek to balance the system (on a minute by minute basis) through the purchase of Balancing Services on an economic basis taking into account:

(i) urgent contingency action to restore operational standards on the transmission system;

(ii) technical constraints imposed on the system from time to time;

(iii) the dynamic operating characteristics of available generation and demand balancing services;

(iv) where BOAs are expected to be issued for periods beyond the wall, those Bid-Offer Prices associated with all BOA timescales, PNs and dynamics for the BMU;

(v) uncertainty in demand at timescales within the BM window;

(vi) other matters provided for in the Grid Code; and

(vii) Services provided on Interconnector BMUs that could be operationally unacceptable to NGET, or commercially / operationally to the External Interconnected System Operator (EISO).

In extreme situations this may require the instruction of Emergency Instructions and/or Involuntary Reductions as defined in Part B Sections 5 and 6.

Part F: Summary of Operation of the GB transmission system from the National Electricity Transmission System Security and Quality of Supply Standard (NETS SQSS)

1. Overview

(a) We shall seek to operate the GB transmission system in accordance with the National Electricity Transmission System Security and Quality of Supply Standard as summarised so that for the secured event (as defined in the NETS SQSS) of a fault outage of any of the following:

- a single transmission circuit, a reactive compensator or other reactive power provider; or
- the most onerous loss of power infeed; or
- where the system is designed to be secure against a fault outage of a section of busbar or mesh corner under planned outage conditions, a section of busbar or mesh corner,

there shall not be any of the following:

- a loss of supply capacity except as specified in the GBSQSS;
- unacceptable frequency conditions;
- unacceptable overloading of any primary transmission equipment;
- unacceptable voltage conditions; or
- system instability.

(b) and for the secured event of a fault outage of:

- a double circuit overhead line; or
- a section of busbar or mesh corner,

there shall not be any of the following:

- a loss of supply capacity greater than 1500 MW;
- unacceptable frequency conditions; or
- unacceptable voltage conditions affecting one or more Grid Supply Points for which the total group demand is greater than 1500 MW; or

- system instability of one or more generating units connected to the supergrid.

(c) and for the secured event on the supergrid of a fault outage of:

- a double circuit overhead line where any part of either circuit is in the England and Wales area; or
- a section of busbar or mesh corner in the England and Wales area,

there shall not be:

- unacceptable overloading of primary transmission equipment in the England and Wales area;
- unacceptable voltage conditions in the England and Wales area.

2. Conditional Further Operational Criteria

If conditions are adverse such that the likelihood of a double circuit overhead line fault is significantly higher than normal; or there is no significant economic justification for failing to secure the transmission system to this criterion and the probability of loss of supply capacity is not increased by following this criterion, the GB Transmission System shall be operated under prevailing system conditions so that for the secured event of:

- a fault outage on the supergrid of a double circuit overhead line

there shall not be:

- where possible and there is no significant economic penalty, any loss of supply capacity greater than 300 MW;
- unacceptable overloading of any primary transmission equipment;
- unacceptable voltage conditions;
- system instability.

1.1 Exceptions

Exceptions to the criteria may be required where variations to the standard connection designs have been agreed.

3. Frequency Control

There should not be “Unacceptable High or Low Frequency Conditions” under the conditions laid down in the Security and Quality of Supply Standard.

These are conditions where:

i) the steady state frequency falls outside the statutory limits of 49.5Hz to 50.5Hz; or

ii) a transient frequency deviation on the MITS persists outside the above statutory limits and does not recover to within 49.5Hz to 50.5Hz within 60 seconds.

Transient frequency deviations outside the limits of 49.5Hz and 50.5Hz shall only occur at intervals which ought to be reasonably considered as infrequent. It is not possible to be prescriptive with regard to the type of secured event which could lead to transient deviations since this will depend on the exact frequency response characteristics of the system which NGET shall adjust from time to time to meet the security and quality requirements of this Standard.

For either significant or abnormal events any frequency deviation below 49.5Hz should not persist for more than 60 seconds, and system frequency should return to between operational limits within 10 minutes.

If necessary we shall achieve, in exceptional circumstances, frequency control by demand control – as specified in OC6 of the Grid Code.

3 Voltage Control

Under normal system conditions we shall seek to purchase and economically schedule sufficient Mvar reserves in order to maintain steady state voltage levels such that:-

- On the 400kV system each user connection site will normally remain within +/- 5% of the nominal value with a minimum/maximum range of

+/-10% however voltages between +5% and +10% should not last longer than 15 minutes.

- On the 275kV and 132kV system each user connection site will normally remain within +/- 10%.

- Below 132kV the limits are +/- 6%.

In addition for any secured event we shall purchase and economically schedule sufficient Mvar reserves in order to limit voltage step change to:-

- +/-6% at the user connection site after a secured event, relaxed to a voltage fall of 12% for loss of a double circuit, busbar or mesh corner. This voltage step change relates to a period about 5 seconds after fault clearance. It must be possible for us to restore voltage at Grid Supply Points (GSPs) to 95% following automatic and manual action within 20 minutes.

- +/- 3% at the user connection site for planned switch operations.

PART G: EXCEPTIONS TO THE BALANCING PRINCIPLES STATEMENT

Infrequently circumstances may arise which require us to operate outside the principles detailed in this statement. Such circumstances are listed below:

(i) Black Start events (as detailed in OC9 of the Grid Code);

(ii) where parts of the transmission system have become islanded (as detailed in OC 9 of the Grid Code);

(iii) when emergency evacuation procedures have been invoked at our control centres or wide spread communication problems are experienced;

(iv) where circumstances exist where not to do so would prejudice the safe and secure operation of the transmission system or would be in breach of statutory obligations;

(v) where operational information indicates insufficient time is available to employ particular measures in accordance with the Statement if balancing is to be achieved; and

(vi) where the Statement has been shown to be inappropriate and the Balancing Principles Statement modification procedures have been implemented but not completed.

For parts (i) to (iii) above we would issue the appropriate system warning in accordance with the Grid Code and occurrences of any of the circumstances above would be reported in our annual statement of performance against the Balancing Principles.

Applicable Balancing Services Volume Data Methodology Statement

Effective Date: [1 April 2013]

Version Number: [4.0]

Published in accordance with Standard Condition C16 of National Grid Electricity Transmission Licence

Version Control

Date	Version No.	Notes
07.02.03	**1.0**	**Initial version**
28.11.03	**1.1**	**Revision to incorporate Maximum Generation Service and Commercial Intertrips as an Applicable Balancing Services.**
04.10.04	**2.0**	**Revisions to incorporate changes as a result of CAP071: the development of Maximum Generation Service**
01.01.05	**2.1**	**Revisions to incorporate changes relating to BETTA**
15.7.05	**2.2**	**Revisions to incorporate changes as a result of CAP076: Treatment of System to Generating Intertripping Schemes**
01.04.07	**2.3**	**Revisions to incorporate Short Term Operating Reserve (STOR)**
01.04.11	**3.0**	**Revision following annual review**
01.04.13	**4.0**	**Revision following annual review**
date	**xx**	**Revision to incorporate changes for Supplemental Balancing Reserve from non-BM Participants**

This Statement has been developed in consultation with the industry and the Authority. The Statement may only be modified in accordance with the processes set out in Standard Condition C16 of the Transmission Licence.

The latest version of this document is available, together with the relevant change marked version (if any), electronically from the National Grid Website:

http://www.nationalgrid.com/uk/Electricity/Balancing/transmissionlicencestatements/
Alternatively a copy may be requested from the following address:

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CONTENTS

PART A: INTRODUCTION

1. Purpose of Document

This document sets out the Applicable Balancing Services Volume Data Methodology that National Grid Electricity Transmission plc (NGET) is required to establish in accordance with Standard Condition C16 of the Transmission Licence. The purpose of this Statement is to set out the information on Applicable Balancing Services that will be taken into account under the Balancing and Settlement Code for the purposes of determining Imbalance Volumes.

This Statement has been developed in consultation with the industry and the Authority. The Statement may only be modified in accordance with the processes set out in Standard Condition C16 of the Transmission Licence. Where we buy, sell or acquire a Balancing Service of a kind or under a mechanism which potentially affects a Party's imbalance position, and it is not covered by this Statement then we shall promptly seek to establish a revised Statement covering such Balancing Services and/or mechanisms in accordance with the relevant provisions of Standard Condition C16 of the Transmission Licence.

The Statement makes reference to a number of definitions contained in the Grid Code, the Connection and Use of System Code and the Balancing and Settlement Code. In the event that any of the relevant provisions in the Grid Code, the Connection and Use of System Code or the Balancing and Settlement Code are amended it may become necessary for us to modify the Statement in order that it remains consistent with the Grid Code, the Connection and Use of System Code and the Balancing and Settlement Code.

In any event, where our statutory obligations or the provisions of the Grid Code are considered inconsistent with any part of this Statement,

then the relevant statutory obligation and/or Grid Code provision will take precedence.

Unless defined in this Statement, terms used herein shall have the same meanings given to them in the Transmission Licence, the Grid Code, the Connection and Use of System Code and/or the Balancing and Settlement Code as the case may be. In this Statement, all references to 'National Grid' shall mean NGET, being the Transmission Company for the purposes of the Balancing and Settlement Code.

The latest version of this document is available electronically from the National Grid Website:

http://www.nationalgrid.com/uk/Electricity/Balancing/transmissionlicencestatements/

Alternatively a copy may be requested from the following address:

Head of Commercial Frameworks - Electricity
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PART B: APPLICABLE BALANCING SERVICES VOLUME DATA 'ABSVD'

1. Basis of Calculation

1.1 Variables included in the ABSVD

The ABSVD is specified in Section Q, Paragraph 6.4 of the Balancing and Settlement Code and consists of QAS_{ij}, being the *Applicable Balancing Services Volume Data* in respect of BM Unit i, in Settlement Period j, determined in accordance with this Statement.

The inclusion of any individual Applicable Balancing Service within the Applicable Balancing Services Volume Data is at the discretion of the Lead Party of the relevant BM Unit (see part C, section 2) unless otherwise directed in the CUSC or in the case of Supplemental Balancing Reserve provided other than through the balancing mechanism. Where an Applicable Balancing Service provider is not the Lead Party of the BM Unit to which the energy is attributed, the inclusion or exclusion of the energy is a matter of negotiation between the service provider and the Lead Party of the BM Unit.

The Applicable Balancing Services Volume Data is used in the calculation of Period BM Unit Balancing Services Volume, QBS_{ij}. QBS_{ij} is the volume of all energy associated with balancing services used in the determination of imbalance. It consists of the volume of Bid Offer Acceptances plus the Applicable Balancing Services Volume Data. The determination of QBS_{ij} is specified in Section T, Paragraph 4.3.2 of the Balancing and Settlement Code:

$$QBS_{ij} = \Sigma^{n}(QAO^{n}_{ij} + QAB^{n}_{ij}) + QAS_{ij}$$

where Σ^{n} represents the sum over all Bid-Offer Pair numbers for the BM Unit.

QBS_{ij} is the volume of Balancing Services per BM Unit. For determination of the account's imbalance volume, it is necessary to determine the Balancing Services volume delivered across the account, $QABS_{aj}$ (the Account Period Balancing Services Volume). This is determined as the sum across the energy account of the Balancing Services volume for each BM unit, multiplied by the applicable loss factor, as specified in Section T, paragraph 4.6.2 of the Balancing and Settlement Code.

$$QABS_{aj} = \Sigma_i \, QBS_{ij} \, X \, TLM_{ij}$$

Where Σ_i represents the sum over all BM Units for which such Energy Account is the corresponding Energy Account of the Lead Party.

The Account Energy Imbalance Volume, $QAEI_{aj}$, is the difference between the energy credited to the account, less the contract position and the Account Period Balancing Services Volume, as specified in accordance with section T, paragraph 4.6.3 of the Balancing and Settlement Code.

$$QAEI_{aj} = QACE_{aj} – QABS_{aj} – QABC_{aj}$$

The Account Energy Imbalance Volume is then multiplied by System Sell Price for positive imbalance volume and System Buy Price for negative imbalance volume to give the Energy Imbalance Cashflows as specified in Section T, Paragraph 4.7 of the Balancing and Settlement Code.

1.2 Balancing Services for inclusion in the ABSVD

Balancing Services are defined in the Transmission Licence and described in more detail in the Procurement Guidelines, which National

Grid is required to establish in accordance with Standard Condition C16 of the Transmission Licence. The purpose of the Procurement Guidelines is to set out the kinds of Balancing Services which we may be interested in purchasing, together with the mechanisms by which we envisage purchasing such Balancing Services. ABSVD covers a subset of the Balancing Services that we intend to procure.

In general, Balancing Services, deemed to be Applicable will be those services required by the System Operator for economic operation of the transmission system, that result in the service provider being exposed to imbalance charges whilst assisting in system balancing. For the avoidance of doubt a consultation will be carried out prior to any further Balancing Services being included in the calculation of ABSVD.

The following Applicable Balancing Services contracts will be included in the calculation of the ABSVD:

- **Short Term Operating Reserve (STOR)** – Utilisation volumes for participants within the Balancing Mechanism will be dealt with automatically via the BM and will feed into the energy imbalance position via the acceptance of an Offer. Utilisation volumes for non-BM participants will not be subject to the acceptance of an Offer.

  The calculation of ABSVD will include the instructed volume from non-BM providers in relation to the utilisation of STOR.

- **Mode A Frequency Response** – Energy volumes will be determined in accordance with paragraph 4.1.3.9A of the Connection and Use of System Code.

- **Frequency Response other than Mode A Frequency Response** – Utilisation volumes will be determined in accordance with system frequency and the characteristic of the response service.

- **Fast Reserve** – Utilisation volumes for participants within the Balancing Mechanism will be dealt with automatically via the BM and will feed into the energy imbalance position via the acceptance of an Offer. Utilisation volumes for non-BM participants will not be subject to the acceptance of an Offer.

The calculation of ABSVD will include the instructed volume from non-BM providers in relation to the utilisation of Fast Reserve.

- **Commercial Intertrips** – Energy volumes as a result of the operation of the commercial intertrip will be calculated in accordance with the relevant Commercial Services Agreement.

- **Fast De-Load Service (a type of constraint management service)** – Energy volumes as a result of an instruction to fast de-load will be calculated in accordance with the relevant Commercial Services Agreement.

- **Maximum Generation Service** – Utilisation volumes will be calculated in accordance with the CUSC, the relevant Commercial Services Agreement and the methodology contained in Part C of this Statement.

- **System to Generator Operational Intertripping** - Utilisation volumes will be calculated in accordance with Part C of this Statement. For the avoidance of doubt, where an intertripping scheme is a Category 1 Intertripping Scheme as defined in the CUSC and determined within a generator's Bilateral Connection Agreement, $SF_{sm,}$will always be 0.

- **Supplemental Balancing Reserve Service** – Utilisation quantities will be calculated in accordance with the relevant Supplemental Balancing Reserve Agreement and the methodology contained in Part C of this Statement.

1.3 ABSVD Provision

ABSVD will be submitted in accordance with section Q, Paragraph 6.4 of the Balancing and Settlement Code. In outline this entails the submission of ABSVD within two Business Days following the relevant Settlement Day.

1.4 Re-submission of ABSVD

In the event that an error is identified in the ABSVD, the data will be re-submitted, as soon as reasonably practicable, once the corrected data is available.

PART C: ABSVD METHODOLOGY

1. Principles

QAS_{ij} will be determined in accordance with the following formula:

$$QAS_{ij} = \sum_{s \in i} \left(SE_{sj} \times SF_{sm} \right)$$

where:

$\sum_{s \in i}$ is the summation across all Ancillary Service and Other Service provision (as referred to in the definition of Balancing Services within the Transmission Licence and described more fully in Parts B and C of the Procurement Guidelines), s, that contribute to the production or consumption of BM Unit i.

$_m$ is the relevant calendar month

$_s$ is the number of a discreet Ancillary Service or Other Service provision.

SE_{sj} Is the expected energy delivered by Ancillary Service or Other Service, s, in Settlement Period j as indicated below.

SF_{sm} is the Service Flag for Service *s* in calendar month m. It takes a value of 0 or 1 as notified by the lead party of the BM Unit which incorporates service s, in accordance with the Notification Procedure.

Determination of SE_{sj}

Where service s is a Mode A Frequency Response service or service s is a response service delivered by free governor action, other than a Mode A Frequency Response service:

$$SE_{sj} = \int_0^{SPD} FR_{ij}(t)dt$$

where

$FR_{ij}(t)$ is defined in accordance with section 4, sub section 1, paragraph 4.1.3.9A of CUSC, except that:

i. Reference to i should be construed as referring to the relevant service, s;

ii. Reference to the Mandatory Service Agreement should be construed as the relevant service agreement; and

iii. Reference to Mode A Frequency Response should be construed as the relevant frequency response.

Where service s is fast reserve, STOR, or occasional (non-dynamic) response (and a bid offer acceptance is not issued in respect of the service call off):

$$SE_{sj} = \int_0^{SPD} E_{sj}(t)dt$$

Where

$E_{sj}(t)$ is the required energy from service s, time t from the start of settlement period j. The required energy is determined with reference to Figure 1 below.

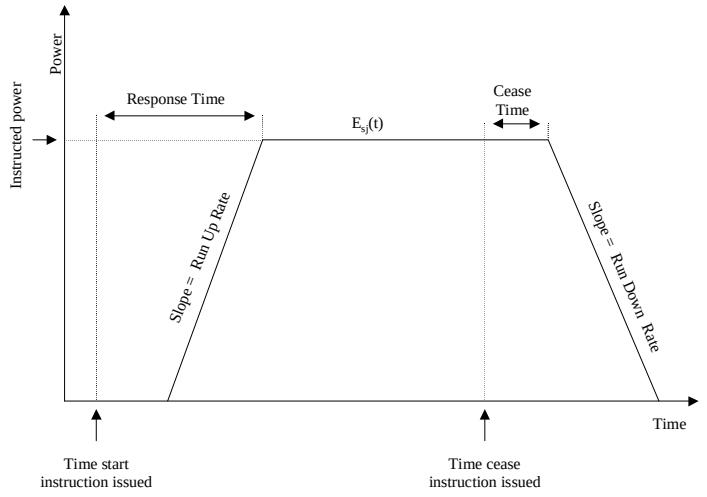


Figure 1 Graph showing determination of $E_{sj}(t)$

where

Time start instruction issued — Is the time that National Grid issues an instruction to the service provider to start delivering the service, and the instruction is not subsequently

	rejected as being incorrectly issued. For the avoidance of doubt, instruction includes a signal from a relay (or other equipment) owned by National Grid to initiate the delivery of an occasional (non-dynamic) response service.
Time cease instruction issued	Is the time that National Grid issues an instruction to the service provider to cease delivering the service.
Response time	Is the time agreed between the provider and National Grid that it will take for the service to be fully delivered from the time the start instruction is issued. In the event that no time has been agreed, it will take the value 0 seconds.
Cease time	Is the time agreed between the provider and National Grid that it will take between a cease instruction been issued and the provider starting to cease delivery. In the event that no time has been agreed, it will take the value 0 seconds.
Run Up Rate	Is the rate agreed between the provider and National Grid that the provider will change load at, in response to a start instruction. In the event that no value has been agreed, it will be deemed to be infinite.
Run Down Rate	Is the rate agreed between the provider and National Grid that the provider will change load at, in response to a cease instruction. In the event that no value has been agreed it will be deemed to be infinite.
Instructed Power	Is the change in power production or consumption instructed by National Grid in accordance with the agreement between the provider and National Grid.

Where service s is the Maximum Generation Service,

$SE_{sj} = Min\ (Qmax_{ij}, X * CEC/2)$

$Qmax_{ij}$	Is the calculated Maximum Generation Service volume as defined by $Max\ (QM_{ij} – (FPN_{ij} + \Sigma(QAB^{n}_{ij} + QAO^{n}_{ij})), 0)$
X	is 0.03 or such figure as may be either: (i) set out in the Maximum Generation Service Agreement for the available BM Unit or (ii) agreed or determined in accordance with Paragraphs 4.2.5.3 to 4.2.5.5 (inclusive) of the CUSC.
CEC	Connection Entry Capacity for the Available BM Unit as defined in the CUSC
QM_{ij}, QAB^{n}_{ij}, QAO^{n}_{ij}, $FPN_{ij}(t)$	Have the meanings ascribed to them in the Balancing and Settlement Code
MEL	Maximum Export Limit as defined in the Grid Code

For the avoidance of doubt, any Maximum Generation Service volume delivered in excess of X multiplied by CEC will be subject to the dispute provision set out in Paragraph 4.2.5 of CUSC. Any volume in excess of X multiplied by CEC will not be classed as an Applicable Balancing Services volume unless otherwise agreed or directed in accordance with the dispute provision set out in Paragraph 4.2.5 of CUSC.

The above calculation will be applied from the start of the settlement period during which the Maximum Generation Service Emergency Instruction has been issued until the end of the settlement period for which the Maximum Generation Service Emergency Instruction is ceased.

The volume identified as Maximum Generation Service (assuming that a settlement period does not end following the issue of a 'cease' instruction, but prior to the return of output to MEL) using the above calculation is demonstrated in Fig 2 below.

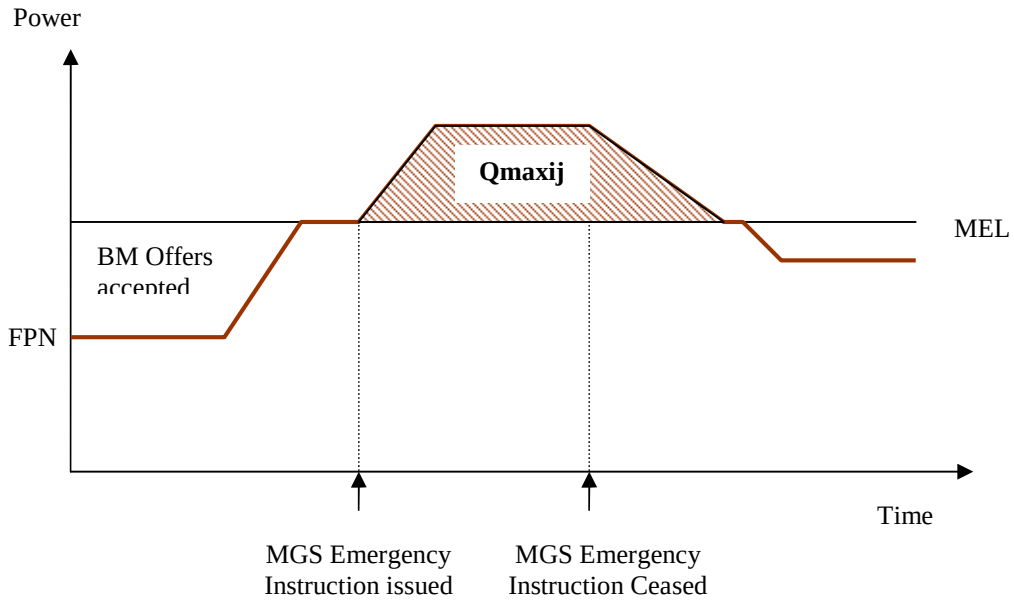


Figure 2 – Graph showing calculation of $Qmax_{ij}$

Where Service s is System to Generator Operational Intertripping Scheme, Commercial Intertripping Scheme or Fast De-Load Service, SE_{sj} will be equal to the reduction in output calculated from the time of the intertrip firing or the fast de-load instruction until the end of the Balancing Mechanism Window Period. The volume output reduction (in MWh) over this period is equal to the integral of spot (MW) Final Physical Notification (FPN), plus the sum of all accepted Bid and Offer spot (MW) values covered by the period. Where an intertrip or fast de-load occurs on a modular BMU and does not affect all

generating units that make up that BMU, the output of the remaining generating units will be taken off the total volume such that SE_{sj} reflects the volume (MWh) associated with the intertrip or fast de-load. This is shown algebraically below:

$$\int_{t_0}^{t_1} \left(FPN_{ij}(t) + \sum^{k} \left(qABO^{kn}{}_{ij}(t) \right) - QM_{ij}(t) \right) d(t)$$

Where

t_0 = time of intertrip firing or fast de-load instruction

t_1 = time at end of Balancing Mechanism Window Period

$FPN_{ij}(t)$ = Final Physical Notification as defined within the BSC

$qABO^{kn}{}_{ij}(t)$ = Accepted Bid-Offer Volume as defined within the BSC

$\sum^{k}$ = Sum over each separate Bid Offer Acceptance

$QM_{ij}(t)$ = Metered output of BM Unit i in settlement period j for spot time t, where Active Energy volumes are estimated from operational metering data held by the Transmission Company

An example of the volume calculated for a given set of circumstances, using the above calculation is demonstrated in Fig 3 below. For the avoidance of doubt, the 'wall' is the end of the Balancing Mechanism Window.

Fig 3 - Graph showing example of SE_{sj} for System to Generator Operational intertripping Scheme or a Commercial Intertripping Scheme (instantaneous trip)

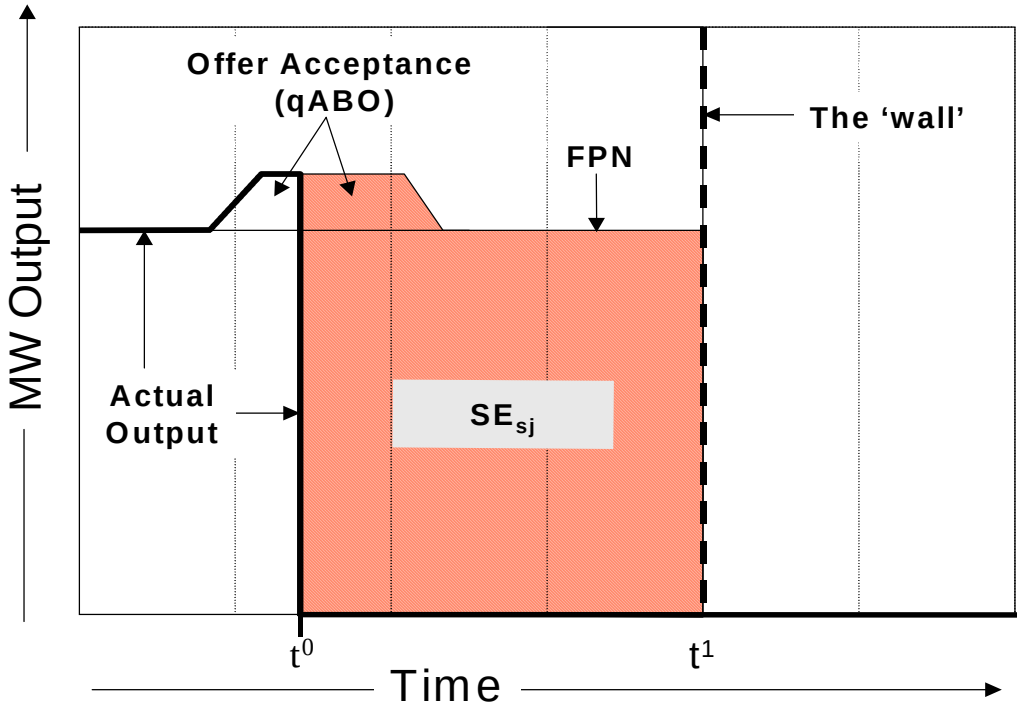
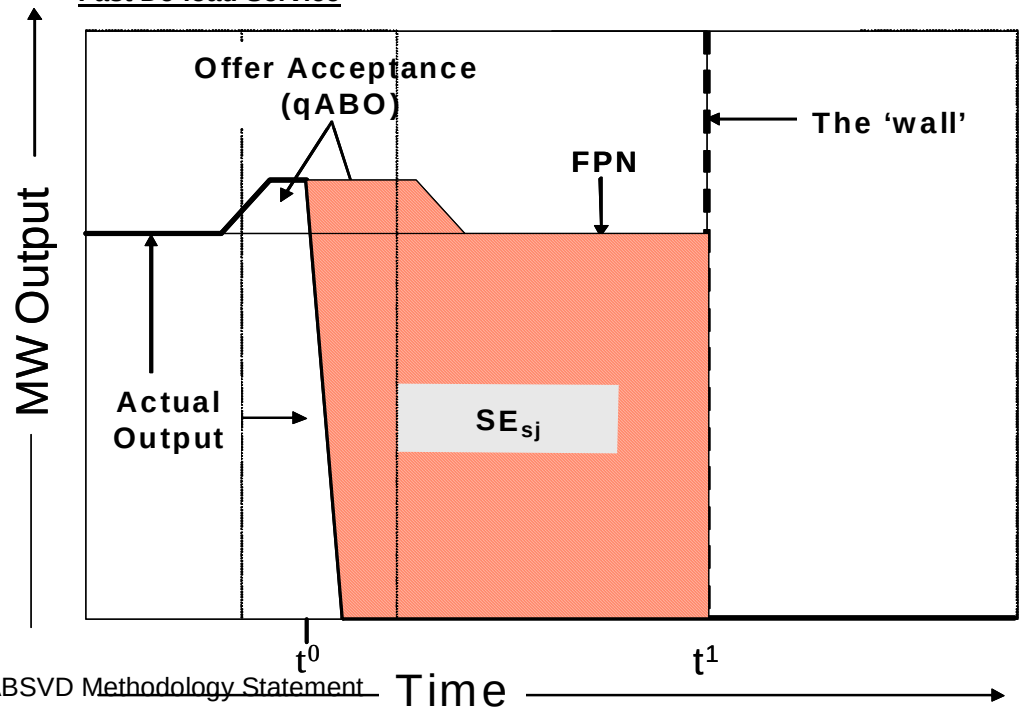


Fig 3a – Graph showing example of SEsj for System to Generator Operational Intertripping Scheme or a Commercial Intertripping Scheme (time delayed) or a Fast De-load Service



Where service s is the Supplemental Balancing Reserve Service, and where the relevant BM Unit is not a BM Participant:

$SE_{sj} = QM_{ij}$

For all other services:

$SE_{sj} = 0$

2. **Notification Procedure**

This procedure allows the Lead Party of a BM unit to notify National Grid, monthly in advance, which (if any) services should be included in the determination of QAS_{ij} unless otherwise directed within the CUSC for the BM unit(s) in respect of which they are the Lead Party or in the case of BM Units providing Supplemental Balancing Reserve other than through the balancing mechanism.

The Lead Party of the BM Unit that incorporates service s may notify National Grid that the value of SF_{sm} to be 1 or 0.

The notification must be made in writing to:

The Settlement Manager
National Grid
National Grid House
Warwick Technology Park
Gallows Hill
Warwick CV34 6DA

For the notification to be valid, it must either:

i. be received by National Grid more that 10 business days before the start of calendar month m; or

ii. be received by National Grid prior to the commencement of the contract for service s.

In the case of Category 1 System to Generator Operational Intertripping, SF_{sm} will always = 0. This is in line with the requirements set out under the CUSC.

In the event that no notification is received for the initial value of SF_{sm}, National Grid will allocate values as follows:

i. In the event that service 's' is Mode A Frequency Response, or Category 2, 3 or 4 System to Generator Operational Intertripping Scheme
SF_{sm}=1; otherwise

ii. SF_{sm}=0.

For subsequent months where a notification is not received, National Grid will allocate a value to SF_{sm}, such that $SF_{sm}=SF_{s(m-1)}$.

These rules imply default initial notification of 'opt-in' for Mode A Frequency Response, and 'opt-out' for all other types of Balancing Services.

3. Disputes

A dispute arises where the Lead Party of the relevant BM Unit disagrees with the value of QAS_{ij} notified by National Grid. Where such a dispute arises, a representative of National Grid and each BSC Party concerned who has authority to resolve the dispute shall meet (including by agreement by telephone) within 10 Business Days of a request by either party (or within such longer period as may be agreed, acting reasonably) and seek to resolve it. If the parties to the dispute are unable to resolve it within 10 Business Days of the meeting (or within such longer period as they may agree within that initial 10 Business Day period, both parties acting reasonably as to

the length of the period), then the parties' obligations under this paragraph to undertake such discussions shall no longer apply in relation to that dispute. Either party may then refer the dispute to arbitration pursuant to the rules of the Electricity Arbitration Association in force from time to time.

The laws of England shall be the proper law of reference to arbitration under this paragraph and in particular (but not so as to derogate from the generality of the foregoing) the provisions of the Arbitration Act 1996 shall apply to any such arbitration wherever it or any part of it shall be conducted.

Any arbitrator or panel of arbitrators appointed under this Paragraph 3 shall determine such issues as are referred to him or them consistently with any determination by the Authority, whether or not relating to the same or different facts.

For the avoidance of doubt, a party may only raise a dispute in respect of QAS_{ij} where they are Lead Party of the relevant BM Unit.

4. Worked Examples

4.1 Provision of Mode A Frequency Response

Note that this example would apply equally to a commercial response service delivered by free governor action.

A generator delivers response as illustrated in Figure 2.

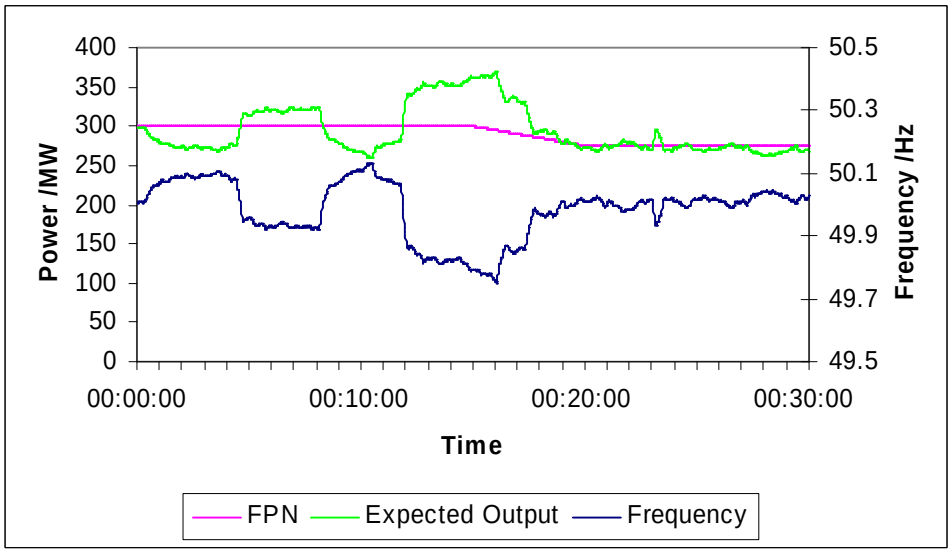


Figure 2 Example of Response Delivery

In accordance with this methodology and the provisions in section 4, sub section 1, paragraph 4.1.3.9A described in CUSC, QAS_{ij} is determined to be 2.5 MWh (meaning that in the relevant half hour, as a result of providing response, an additional 2.5 MWh of energy was required to be produced).

If this party operated a single BM Unit with the following parameters for this settlement period, the impact on central settlement would be as follows:

Contracted Position ($QABC_{aj}$)	137 MWh
Final Physical Notification (FPN_{ij})	145 MWh
Metered Production (QM_{ij})	147.5 MWh
Applicable Balancing Services Volume (QAS_{ij})	2.5 MWh
Transmission Loss Multiplier (TLM_{ij})	0.95
Bid Offer Acceptances	0 MWh

The credited energy volume QCE_{aij} is determined in accordance with the Balancing and Settlement Code, section T, paragraph 4.5.1(b):

$QCE_{iajj} = QM_{ij} \times TLM_{ij} - \Sigma_a QCE_{iajj}$

$= 147.5 \text{ MWh} \times 0.95 – 0 \text{ MWh}$

$= 140.13 \text{ MWh}$

(where Σ_a is the sum over Energy Accounts of Subsidiary Parties – in this example it is assumed that all energy is credited to the lead party.)

The account credited energy volume $QACE_{aj}$, would be calculated in accordance with the Balancing and Settlement Code, section T, paragraph 4.6.1:

$QACE_{aj} = \Sigma_i QCE_{iaj}$

$= 140.13 \text{ MWh}$

The Balancing Services Volume is determined in accordance with the Balancing and Settlement Code, section T, paragraph 4.3.2:

$QBS_{ij} = \Sigma^n(QAO^n_{ij} + QAB^n_{ij}) + QAS_{ij}$

$= 0 + 2.5 \text{ MWh}$

The Account Period Balancing Services volume is determined in accordance with the Balancing and Settlement Code, section T, paragraph 4.6.2:

$QABS_{aj} = \Sigma_i QBS_{ij} \times TLM_{ij}$

$= 2.5 \text{ MWh} \times 0.95$

$= 2.38 \text{ MWh}$

The Account Energy Imbalance Volume ($QAEI_{aj}$) is determined in accordance with the Balancing and Settlement Code, section T, paragraph 4.6.3:

$QAEI_{aj} = QACE_{aj} – QABS_{aj} – QABC_{aj}$

$QAEI_{aj} = 140.13 \text{ MWh} – 2.38 \text{ MWh} – 137 \text{ MWh}$

$= 0.75 \text{ MWh}$

In this example, the account would receive a payment for 0.75 MWh at System Sell Price, in accordance with the Balancing and Settlement code, section T, paragraph 4.7.1.

4.2 Provision of Short Term Operating Reserve (STOR)

Note that this example would apply equally to Fast Reserve or Occasional (non-dynamic) Response.

Consider a STOR provider with the following parameters:

Response Time	15 minutes
Run Up Rate	10 MW/minute
Run Down Rate	– 5 MW/minute

Cease Time 5 minutes

At 00:00 National Grid instructs 50 MW of STOR from the provider.

At 01:00 National Grid instructs the provider to cease delivery.

This leads to the delivery profile shown in figure 3:

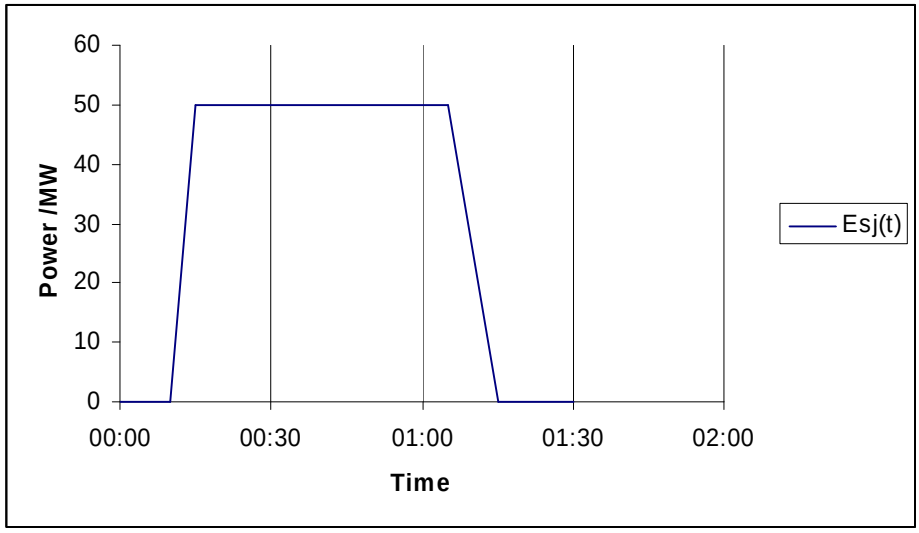


Figure 2 Example STOR Delivery

Settlement Period (Start time)	00:00	00:30	01:00	01:30
SE_{sj} /MWh	14.58	25	8.33	0

If this were the only Applicable Balancing Service provision within the BM unit with the service flag set to 1, then QAS_{ij} would take the same values.

If this party operated a single BM Unit with the following parameters for the settlement period starting 00:30, then the impact on central settlement would be as follows:

Contracted Position ($QABC_{aj}$)	–200 MWh
Final Physical Notification (FPN_{ij})	–190 MWh
Metered Consumption (QM_{ij})	–165 MWh
Applicable Balancing Services Volume (QAS_{ij})	25 MWh
Transmission Loss Multiplier (TLM_{ij})	1.05
Bid Offer Acceptances	0 MWh

The credited energy volume QCE_{iajj} is determined in accordance with the Balancing and Settlement Code, section T, paragraph 4.5.1(b):

$QCE_{iajj} = QM_{ij} \times TLM_{ij} – \Sigma_a QCE_{iajj}$

$= – 165 \text{ MWh} \times 1.05 – 0 \text{ MWh}$

$= – 173.25 \text{ MWh}$

(where Σ_a is the sum over Energy Accounts of Subsidiary Parties – in this example it is assumed that all energy is credited to the lead party.)

The account credited energy volume $QACE_{aj}$, would be calculated in accordance with the Balancing and Settlement Code, section T, paragraph 4.6.1:

$QACE_{aj} = \Sigma_i QCE_{iajj}$

$= –173.25 \text{ MWh}$

The Balancing Services Volume is determined in accordance with the Balancing and Settlement Code, section T, paragraph 4.3.2:

$QBS_{ij} = \Sigma^n(QAO^n_{ij} + QAB^n_{ij}) + QAS_{ij}$

$= 0 + 25 \text{ MWh}$

The Account Period Balancing Services volume is determined in accordance with the Balancing and Settlement Code, section T, paragraph 4.6.2:

$QABS_{aj} = \Sigma_i QBS_{ij} \times TLM_{ij}$

$= 25 \text{ MWh} \times 1.05$

$= 26.25 \text{ MWh}$

The Account Energy Imbalance Volume ($QAEI_{aj}$) is determined in accordance with the Balancing and Settlement Code, section T, paragraph 4.6.3:

$QAEI_{aj} = QACE_{aj} – QABS_{aj} – QABC_{aj}$

$QAEI_{aj} = – 173.25 \text{ MWh} – 26.25 \text{ MWh} – (– 200 \text{ MWh})$

$= 0.5 \text{ MWh}$

In this example, the account would receive a payment for 0.5 MWh at System Sell Price, in accordance with the Balancing and Settlement code, section T, paragraph 4.7.1.

Balancing Services Adjustment Data Methodology Statement

Effective Date: [1st April 2013]

Version Number: [7.0]

Published in accordance with Standard Condition C16 of National Grid Electricity Transmission Licence

Version Control

Date	Version No.	Notes
20.3.01	1.0	Initial version
10.4.01	1.1	Revision to include price adjusters for reserve option fees
24.9.01	1.2	Revision to incorporate implementation of P8 and P18 within the BSC. Effective in respect of Settlement Days from and including 25 September 2001
28.3.02	2.0	Revision to incorporate implementation of P48 within the BSC. Effective in respect of Settlement Days from and including 2 April 2002.
25.3.03	2.1	Revision to incorporate implementation of P74/P78 within the BSC. Effective in respect of Settlement Days from and including [Date to be coincident with P74/P78 Implementation]
24.10.03	3.0	Revision to amend the allocation of standing reserve option fees
28.11.03	3.1	Revision to incorporate changes associated with Maximum Generation Service.
01.01.05	3.2	Revisions to incorporate changes relating to BETTA
15.07.05	3.3	Revisions to incorporate changes as a result of CAP076: Treatment of System to Generating Intertripping Schemes
01.11.06	4.0	Revisions to incorporate changes as a result of

Date	Version No.	Notes
		BM Start-Up service
22.01.07	**4.1**	**Revisions to update the Standing Reserve Weighting Factors and to clarify the treatment of Supplemental Standing Reserve in the BPA calculation**
01.04.07	**4.2**	**Revisions to incorporate Short Term Operating Reserve (STOR) and to publish STOR weighting factors on National Grid's industry information website**
05.11.09	**5.0**	**Revisions to incorporate changes as a result of P217A: Revised Tagging Process and Calculation of Cash Out, Cap144: Emergency Instruction to emergency de-energise, and to incorporate Commercial Intertrip volumes**
01.04.11	**6.0**	**Revision following annual review**
01.04.13	**7.0**	**Revision following annual review**
date	**XX**	**Revision to incorporate Demand Side Balancing Reserve and Supplemental Balancing Reserve**

This Statement has been developed in consultation with the Authority. The Statement may only be modified in accordance with the processes set out in Standard Condition C16 of the Transmission Licence. Where we buy, sell or acquire any relevant balancing services of a kind or under a mechanism which is not covered by this Statement then we shall promptly seek to establish a revised Statement covering such balancing services and/or mechanisms in accordance with the relevant provisions of Standard Condition C16 of the Transmission Licence.

In the event that it is necessary to modify this Statement in advance of issuing an updated version of this document, then this will be done by issuing a supplement to this Statement.

The latest version of this document is available, together with the relevant change marked version (if any), electronically from the National Grid Website;
http://www.nationalgrid.com/uk/Electricity/Balancing/transmissionlicencestatements/

Alternatively a copy may be requested from:

Head of Commercial Frameworks - Electricity
National Grid
National Grid House
Warwick Technology Park
Gallows Hill
Warwick CV34 6DA

Email: BalancingServices@nationalgrid.com

CONTENTS

PART A: INTRODUCTION

1 Purpose of Document

This document sets out the Balancing Services Adjustment Data methodology which National Grid Electricity Transmission plc (NGET) is required to establish in accordance with Standard Condition C16 of the Transmission Licence. The purpose of this Statement is to set out the information on relevant balancing services that will be taken into account under the Balancing and Settlement Code for the purposes of determining Imbalance Price(s).

In the event that it is necessary to modify this Statement in advance of issuing an updated version of this document, then this will be done by issuing a supplement to this Statement.

This Statement has been developed in consultation with the Authority. The Statement may only be modified in accordance with the processes set out in Standard Condition C16 of the Transmission Licence. Where we buy, sell or acquire any relevant balancing services of a kind or under a mechanism which is not covered by this Statement, we shall promptly seek to establish a revised Statement covering such balancing services and/or mechanisms in accordance with the relevant provisions of Standard Condition C16 of the Transmission Licence.

The Statement makes reference to a number of definitions contained in the Grid Code and Balancing and Settlement Code. In the event that any of the relevant provisions in the Grid Code or Balancing and Settlement Code are amended it may become necessary for us to modify the Statement in order that it remains consistent with the Grid Code or Balancing and Settlement Code.

In any event, where our statutory obligations or the provisions of the Grid Code are considered inconsistent with any part of this Statement, the relevant statutory obligation and/or Grid Code provision will take precedence.

Unless defined in this Statement, terms used herein shall have the same meanings given to them in the Transmission Licence, the Grid Code and/or the Balancing and Settlement Code as the case may be.

PART B: BALANCING SERVICES ADJUSTMENT DATA ('BSAD')

1 The Balancing Service Adjustment Data ('BSAD') variables

The Balancing Service Adjustment Data ('BSAD') is used as part of the electricity imbalance price calculation specified in section T, paragraphs 4.4 of the Balancing and Settlement Code. Section Q Paragraph 6.3.2 of the Balancing and Settlement Code specifies the BSAD data for each settlement period as:

(a) The unique sequential number for each Balancing Services Adjustment Actions;
(b) for each such Balancing Services Adjustment Action;
    i. the Balancing Services Adjustment Volume;
    ii. the Balancing Service Adjustment Cost; and
    iii. Whether the Transmission Company has classified such Balancing Services Adjustment Action as "SO Flagged";
(c) Buy Price Price Adjustment; and
(d) Sell Price Price Adjustment.

2 Balancing Service Adjustment Actions

Any relevant balancing service, taken outside the Balancing Mechanism, will be provided through BSAD as a Balancing Service Adjustment Action.

For each balancing service provided as a Balancing Service Adjustment Action, the energy bought or sold in MWh and the cost paid for each service in £ will be included. Each Balancing Service Adjustment Action will also be accompanied by an identifier indicating whether the balancing service was used for system management reasons. The System Management Action Flagging methodology statement describes

the process National Grid will use to identify whether Balancing Service Adjustment Actions were used for system management reasons.

2.1 Balancing services included within Balancing Service Adjustment Actions

Balancing services are defined in the Procurement Guidelines which National Grid is required to establish in accordance with Standard Condition C16 of the Transmission Licence. The purpose of the Procurement Guidelines is to set out the kinds of balancing services which National Grid may be interested in purchasing in the role of System Operator, together with the mechanisms by which National Grid envisages purchasing such balancing services.

Balancing Service Adjustment Actions may include, but are not limited to, the following balancing services:

Forward Contracts

The costs and volumes of the following balancing services will be included as Balancing Service Adjustment Actions:

- energy related products
- pre gate balancing transactions ('PGBTs'); and
- system-to-system services (including services via Interconnectors, Constraint Management & Balancing service and Emergency Assistance service)

All system-to-system services will be included within BSAD as individual Balancing Service Adjustment Actions, except in circumstances where multiple system-to-system actions, initiated by the same party are taken within a particular settlement period on a particular interconnector from a

particular service. In such cases, these services will be provided as a single Balancing Service Adjustment Action and consequently, the volume and cost of these services will be aggregated. This reflects the current contractual arrangements.

Below is an example of single aggregated situation. Note that this example is for illustration purposes only.

1. National Grid sells 50MWh in settlement period 10 over the French link at a price of £50/MWh from the Constraint Management & Balancing Service.
2. National Grid later buys 75MWh in settlement period 10 over the French link at a price of £60/MWh from the Constraint Management & Balancing Service.

The output from this example to the Balancing Service Adjustment Actions is as follows;

75MWh - 50MWh = 25MWh

The Balancing Service Adjustment Volume = 25MWh

25MWh * £60/MWh = £1500

The Balancing Service Adjustment Cost = £1500

Maximum Generation

This service is for a non-firm provision of energy, above generators Maximum Export Level (MEL), called upon after gate closure. Contracts for Maximum Generation are utilisation based only. National Grid will estimate volume and associated cost of the service and will include this estimate in a re-submission of BSAD to the Settlement Administration Agent (SAA) for use in the calculation of the Interim Information Settlement Run. Actual energy delivered, and the associated cost of provision, will not be known until BM Unit Metered Volume (QM_{ij}), as defined within the BSC, are available following the Interim Information Run. National Grid will provide final volumes and costs associated with Maximum Generation Services as soon as practicable, but in any case prior to the Initial Settlement Run.

Emergency Deenergisation Instructions

In certain circumstances, it may be necessary for National Grid to take Emergency Deenergisation Instructions. Such actions will be taken in accordance with Section 5.2 of the CUSC for the purpose of de-synchronising and de-energising Generating Unit(s). The volume for inclusion in BSAD will be calculated as the expected energy delivered up to the 'wall'[1].

However, as payment for such actions are administered through the CUSC and are consequently not open to the 'pay as bid' approach of the Balancing Mechanism, such actions will be treated as an unpriced.

System-to-Generator Operational Intertripping

System-to-Generator Operational Intertripping service results, in certain circumstances, in the automatic tripping of Generating Unit(s). The contract details associated with a System-to-Generator Operational Intertripping Scheme are contained in section 4.2A of the CUSC and Appendix F3 of a generator's Bilateral Connection Agreement. The volume for inclusion in BSAD will be calculated as the expected energy delivered (SE_{sj}) in accordance with the methodology outlined within the ABSVD Methodology Statement, where service s is System-to-Generator Operational Intertripping. The volume for such balancing services will be included within BSAD as Balancing Service Adjustment Actions. However this service is not paid on a £/MWh basis and therefore the volume will be unpriced.

Commercial Intertrip

[1] The 'wall' means up to the end of the Balancing Mechanism Window Period

The commercial intertrip service may, in certain circumstances, result in the automatic tripping of Generating Units(s). The volume for inclusion in BSAD will be calculated as the expected energy delivered up to the wall. However, the energy volume provided through BSAD will be unpriced as the service is not contracted on a £/MWh basis.

3 Price Adjusters

Where National Grid pays option fees to either, facilitate access to MW capacity within the Balancing Mechanism or to facilitate the withdrawal of MW capacity from the Balancing Mechanism, such fees will be represented through the Price Adjusters. Specifically, fees paid to facilitate additional MW capacity will be represented through the Buy Price Adjuster and fees paid to facilitate the withdrawal of MW capacity through the Sell Price Adjuster.

3.1 Buy Price Adjuster (BPA)

The formula below illustrates how the costs associated with such option fees are converted into a £/MWh figure.

$$BPA_j = \frac{[((\sum SC) * wf_j) + (\sum RC_j) + (\sum FC_j)}{(cS_j + cR_j + cF_j)]} + \sum \frac{(BC}{cB)}$$

SC = cost of purchases of STOR option fees for the relevant day (£)

wf_j[2] = relevant STOR weighting factor as set out in Appendix A

RC_j = cost of purchases of firm regulating reserve option fees (£)

FC_j = cost of purchases of Forward Contract option fees (£)

cS_j = capability of STOR contracts for the relevant settlement period (MWh)

cR_j = capability of firm regulating reserve contracts for the relevant settlement period (MWh)

cF_j = capability of Forward contracts for the relevant settlement period (MWh)

BC = cost of BM StartUp instructions to minute t (£)

cB = volume capability of BM StartUp instructions over the defined BPA period to minute t (MWh)

BMStartUp Time = all minutes associated with BM StartUp instruction

For the avoidance of doubt, if the denominator of BPA is zero in any settlement period, then BPA will be set to zero in that period.

3.1.1 Balancing services included within the Buy Price Adjuster

The Buy Price Adjuster may include, but is not limited to, the following balancing services:

Short Term Operating Reserve (STOR)

In these contracts National Grid will pay option fees either in £/h or £/MWh for service availability during specific half-hour periods. Utilisation payments for participants within the Balancing Mechanism will be dealt with automatically via the BM and will feed into the energy imbalance price calculation via the acceptance of an Offer. Utilisation payments for non-BM participants will be made via a separate balancing services contract payment and will not feed into the energy imbalance price calculation.

STOR Option Fees feed into the calculation of BPA and will be allocated into specific settlement periods in accordance with the weighting factors set out in Appendix A.

DSBR and Supplemental Balancing Reserve

Demand Side Balancing Reserve (DSBR) and Supplemental Balancing Reserve options fees will not feed into the calculation of BPA.

[2] The j notation indicates the variable is directly related to the settlement period

BM Start-Up

The BM Start-Up service allows National Grid to access energy from BM Units that would not otherwise have run and are unable to start-up within BM timescales on the day. Firm payments for this service are made on a £/h basis, to remunerate the costs of preparing a BMU to start up and synchronise within BM timescales.

The costs incurred in creating additional reserve availability will feed into the calculation of BPA, and will be allocated into the periods where the requirement exists (as identified by National Grid at the time of instruction). As National Grid's reserve requirements vary with lead-time, the accrual of costs will need to take account of the amount of reserve that these costs are being incurred to meet, at the relevant lead-time.

For the avoidance of doubt, the costs will not feed into the BPA calculation in circumstances where National Grid uses BM Start-Up services for system management reasons (as defined within the System Management Action Flagging Methodology Statement).

Regulating Reserve

For firm provision of this service National Grid will pay option fees with any utilisation fees being fixed via agreement of BM Offers.

Firm Regulating Reserve option payments for increasing generation or reducing demand will feed into the calculation of the BPA. This will be calculated by dividing the total option fee in any settlement period by the total contracted capability.

Similarly any option payments for reducing generation or increasing demand (negative reserve) will feed into the calculation of the SPA.

3.1.2 Worked Example – Buy Price Adjuster

This example shows how options fees paid by National Grid for balancing services are reflected within the Buy Price Adjuster. This example is illustrative only, for the purposes of demonstrating how BPA is calculated.

The example;

- STOR contracts

  Total STOR option cost for the day = £1000

  SC = £1000

  STOR weighting factor for the settlement period = 0.06

  wf_j = 0.06

  Declared STOR capability for the settlement period = 20MWh

  cS_j = 20MWh

- No firm Regulating Reserve contracts have been purchased

  RC_j = £0

  cR_j = 0MWh

- No Forward contract option fees have been purchased

  FC_j = £0

  cF_j = 0MWh

- BM Start-Up

  BM Start-Up cost = £2000 / hr

  Period unit is warmed = 8hrs

  BC = £2000 * 8hrs

  BC = £16000

  Generator capacity = 250MW

  Requirement period = 4hrs

  cB = 250MW * 4hrs

  cB = 1000MWh

$$BPA_j = \frac{[((\sum SC) * wf_j) + (\sum RC_j) + (\sum FC_j)}{(cS_j + cR_j + cF_j)]} + \sum_{t \in StartUpTime} \frac{BC}{cB}$$

$$BPA_j = \frac{[(((£1000) * 0.06) + £0 + £0}{(20MWh + 0MWh + 0MWh)]} + \sum_{t \in StartUpTime} \frac{£16000}{1000MWh}$$

$$BPA_j = £3/MWh + £16/MWh$$

$$BPA_j = £19/MWh$$

3.2 Sell Price Adjuster (SPA)

The formula below illustrates how the costs associated with such option fees are converted into a £/MWh figure.

$$SPA_j = \frac{(\sum NC_j + \sum FC_j)}{(cN_j + cF_j)]}$$

NC_j = cost of negative reserve option fees (£)

FC_j = cost of purchases of Forward Contract option fees (£)

cN_j = capability of negative reserve (MWh)

cF_j = capability of Forward contracts (MWh)

For the avoidance of doubt, if the denominator of SPA is zero in any settlement period, then SPA will be set to zero in that period.

3.2.1 Worked Example – Sell Price Adjuster

This example shows how options fees paid by National Grid for particular balancing services are provided through the Sell Price Adjuster. This example is illustrative only, for the purposes of demonstrating how SPA is calculated.

The example;

- Forward contracts option fees

  Option fees purchased for 15 settlement periods

  Total option fees of £3000 to withdraw 150MWh per settlement period

  cF = 150MWh

  Aggregated cost of forward contract option fees per settlement period

  = £3000 / 15

  = £200

  FC = £200

$$SPA_j = \frac{(\sum NC_j + \sum FC_j)}{(cN_j + cF_j)]}$$

$$SPA_j = \frac{(£0 + £200)}{(0MWh + (-150MWh))}$$

$$SPA_j = -£1.333/MWh$$

PART C: BSAD Submission

1 BSAD Provision

BSAD will be submitted in accordance with section Q, Paragraph 6.3 of the Balancing and Settlement Code. In outline this entails the submission of BSAD to the Balancing Mechanism Reporting Agent (BMRA) at or before 5pm each day to cover the 24 hour period from half-hour ending 00:30 to half-hour ending 24:00 for the following day. BSAD amendments for previous periods will also be included in the submission.

This initial submission of BSAD to the BMRA will include the Balancing Service Adjustment Actions, BPA and SPA for each settlement period.

The costs and volumes of System-to-System services, Maximum Generation services, Emergency Deenergisation Instructions, System-to-Generator Operational Intertrips and Commercial Intertrips will be included in a post event re-submission(s) of BSAD as described in section 7.

BSAD will also be published on the National Grid Website.

BSAD will also be submitted on a reasonable endeavours basis to the BMRA on a half hourly basis as soon as possible after Gate Closure. In the event that the half hourly data is not available, then the day ahead submission will prevail.

2 Basis of BSAD

The calculation of the BSAD will be performed on the following basis:

- Reserve availability will be calculated on the basis of week ahead submissions of availability from service providers;
- If no week ahead submission is received from a service provider then zero availability of that contract will be assumed in the calculation of BPA; and
- Any forward contracts struck prior to the submission of BSAD at 5pm at the day-ahead stage will be included. Best endeavours will be employed to include all the contracts that have been entered into prior to 5pm.

3 Re-submission of BSAD

The BSAD will be re-submitted, if required, post event to cover:

- The correction of any errors in the original submission made at 5pm at the Day Ahead stage;
- Adjustments to any of the variables to account for any forward contracts entered into between the day ahead and real time that were not included in the original submission;
- Inclusion of any System-to-System services;
- Inclusion of any Maximum Generation Service volumes and payments;
- Inclusion of any Emergency Deenergisation Instruction volumes; and
- Inclusion of any System-to-Generator Operational Intertripping volumes; and
- Inclusion of any Commercial intertrip volumes.

Any of these circumstances could result in revisions to any of the variables within BSAD and hence SBP and SSP.

If re-submission of BSAD is required, for any of the reasons above, then National Grid will endeavour to do this in sufficient time to allow the revised variables to be included in the calculation of SSP and SBP in the Interim Information Settlement Run.

Appendix A: Calculation and Publication of Short Term Operating Reserve (STOR) Weighting Factors

1. What are the weighting factors?

The calculation of BPA uses a set of weighting factors to allocate daily Short Term Operating Reserve (STOR) availability fees into settlement periods within the day. This Appendix describes the methodology for calculating these weighting factors.

The purpose of the weighting factors is to allocate reserve availability costs into availability windows according to the likely pattern of utilisation, determined from previous experience of reserve utilisation.

2. Key steps in the calculation of the weighting factors

National Grid will calculate the weighting factors as described below:

a) As part of the STOR service, National Grid will set out the seasons and availability windows as follows:

i. The current year will be divided into seasons in order to cater for the varying reserve utilisation pattern across the year. The duration of each season may change from time to time and National Grid will publish this information on its industry information website. Seasonal information can be found within the Tender Sheets supporting each Tender Round, accessed from the link below.

http://www.nationalgrid.com/uk/Electricity/Balancing/services/STOR/

ii. Each season will be divided into Working Days (including Saturdays) and Non-working Days (Sundays and most Bank Holidays) in

order to account for the varying reserve utilisation pattern within the week. Each day type (Working Day, Non-working Day) will be further divided into periods ('Availability Windows') of likely reserve utilisation; the Availability Windows will form the basis for allocating the weighted costs of STOR option fees.

b) National Grid will compile the data on STOR utilisation from the previous year in order to determine a pattern of likely utilisation for the current year (1 April - 31 March); this data will consist of delivery of reserve from both BM and Non-BM Units where availability was procured to provide the STOR service.

   However, data from the previous 2 years will be used where National Grid determines that the previous year provides insufficient data to determine a pattern of likely use.

c) The STOR data from the previous year will be categorised by season and by day type. For example, for 6 seasons and 2 day types, there will be 12 categories (season / day type combinations) of STOR data.

d) For a given category in the current year, an aggregate STOR volume (MWh) will be determined for a given settlement period, which will be the sum of the STOR utilisation volumes (MWh) from all such settlement periods in the relevant category from the previous year. For example, the aggregate STOR volume for settlement period 1 for Working Days in season 1 will be the sum of STOR volumes in the first settlement period of all Working Days in season 1. Similarly, the aggregate STOR volumes will be determined for the remaining settlement periods in order to determine the volumetric utilisation profile for a given season and day type combination.

e) The process outlined in item (d) will be repeated for the remaining categories, resulting in one volumetric profile for each season and day

type combination. For example, for 6 seasons and 2 day types, there will be12 such profiles.

f) Each volumetric profile will be superimposed on the relevant Availability Windows for the current year (step a(ii)). In order to ensure 100% cost allocation within the Availability Windows, any volumetric data falling outside the Availability Windows will be set to zero.

i. If no historical utilisation data exists for one or more settlement periods within the Availability Window for the current year, the volumetric data for such settlement period(s) will be set to zero.

ii. If no historical utilisation data exists in the entire window (e.g. if a new availability window is introduced), National Grid will take into account historical utilisation of other balancing services and assess its appropriateness in the calculation of the weighting factors.

g) For each volumetric profile, the volume (V_j) of STOR utilised in each settlement period 'j' (within the Availability Windows for the current year) will be added together to determine the total volume (V_T) of STOR utilised within the day.

h) The weighting factor (WF_j) for each settlement period 'j' within the day will be derived as:

WF_j (%) = V_j / V_T * 100

i) Steps (g) and (h) will be repeated for each season, resulting in two sets of weighting factors ($WFwd_i$ for working days and $WFnwd_i$ for non-working days) for the relevant season. A general form of the output from this process (for one season) is shown in Table 1 below. Table 1 also shows

that, for each day type, the weighting factors will add up to 100% thus ensuring 100% allocation of the daily STOR option fees.

Table 1

Format for Weighting Factors

	Weighting Factors for Season 1	
Settlement Period	**Working Days (%)**	**Non-Working Days (%)**
1	$WFwd_1$	$WFnwd_1$
2	$WFwd_2$	$WFnwd_2$
3	$WFwd_3$	$WFnwd_3$
4	$WFwd_4$	$WFnwd_4$
5	$WFwd_5$	$WFnwd_5$
6	$WFwd_6$	$WFnwd_6$
7	$WFwd_7$	$WFnwd_7$
8	$WFwd_8$	$WFnwd_8$
9	$WFwd_9$	$WFnwd_9$
10	$WFwd_{10}$	$WFnwd_{10}$
11	$WFwd_{11}$	$WFnwd_{11}$
12	$WFwd_{12}$	$WFnwd_{12}$
13	$WFwd_{13}$	$WFnwd_{13}$
14	$WFwd_{14}$	$WFnwd_{14}$
15	$WFwd_{15}$	$WFnwd_{15}$
16	$WFwd_{16}$	$WFnwd_{16}$
17	$WFwd_{17}$	$WFnwd_{17}$
18	$WFwd_{18}$	$WFnwd_{18}$
19	$WFwd_{19}$	$WFnwd_{19}$
20	$WFwd_{20}$	$WFnwd_{20}$
21	$WFwd_{21}$	$WFnwd_{21}$
22	$WFwd_{22}$	$WFnwd_{22}$
23	$WFwd_{23}$	$WFnwd_{23}$
24	$WFwd_{24}$	$WFnwd_{24}$
25	$WFwd_{25}$	$WFnwd_{25}$
26	$WFwd_{26}$	$WFnwd_{26}$
27	$WFwd_{27}$	$WFnwd_{27}$
28	$WFwd_{28}$	$WFnwd_{28}$
29	$WFwd_{29}$	$WFnwd_{29}$
30	$WFwd_{30}$	$WFnwd_{30}$
31	$WFwd_{31}$	$WFnwd_{31}$
32	$WFwd_{32}$	$WFnwd_{32}$
33	$WFwd_{33}$	$WFnwd_{33}$
34	$WFwd_{34}$	$WFnwd_{34}$
35	$WFwd_{35}$	$WFnwd_{35}$
36	$WFwd_{36}$	$WFnwd_{36}$
37	$WFwd_{37}$	$WFnwd_{37}$
38	$WFwd_{38}$	$WFnwd_{38}$
39	$WFwd_{39}$	$WFnwd_{39}$
40	$WFwd_{40}$	$WFnwd_{40}$
41	$WFwd_{41}$	$WFnwd_{41}$
42	$WFwd_{42}$	$WFnwd_{42}$
43	$WFwd_{43}$	$WFnwd_{43}$
44	$WFwd_{44}$	$WFnwd_{44}$
45	$WFwd_{45}$	$WFnwd_{45}$
46	$WFwd_{46}$	$WFnwd_{46}$
47	$WFwd_{47}$	$WFnwd_{47}$
48	$WFwd_{48}$	$WFnwd_{48}$
Total	**100%**	**100%**

j) A complete set of weighting factors for all seasons and day types will be derived, and summarised, in a similar format to Table 1.

k) National Grid will endeavour to update the weighting factors on a rolling basis using previous year's STOR utilisation data. However, the timing and frequency of updates will depend on the availability of previous year's STOR utilisation data.

l) National Grid will update the weighting factors periodically in order to ensure that they reflect the changes in utilisation pattern, and will endeavour to do so at least one month in advance of the relevant season to which the weighting factors apply. For example, for the seasons falling in the period from April to October in a given year, the weighting factors will be updated by the end of February in the same calendar year, and, for the seasons falling in the period from October to April, the weighting factors will be updated by the end of August.

m) In exceptional circumstances, if the weighting factors have not been revised, National Grid will use the prevailing weighting factors for the calculation of BPA.

3. Publication of the Weighting Factors

i. National Grid will publish the weighting factors on its industry information web site (http://www.nationalgrid.com/uk/Electricity/Balancing/) as soon as these are available. The timing of publication of the weighting factors will depend on the availability of the historical data used in the determination of the weighting factors.

ii. The weighting factors will be published at least one month in advance of the relevant seasons to which the weighting factors apply.

System Management Action Flagging Methodology Statement

Effective Date: [1st April 2013]

Version Number: [3.0]

Published in accordance with Standard Condition C16 of National Grid Electricity Transmission Licence

Version Control

Date	Version No.	Notes
05.11.09	1.0	Initial version
01.04.12	2.0	Addition of reference to Black Start warming flagging
01.04.13	3.0	Revision following annual review.
date	xx	Revision for Supplemental Balancing Reserve and Demand Side Balancing Reserve

The System Management Action Flagging Methodology Statement has been developed by National Grid Electricity Transmission plc (National Grid).

Where National Grid amends the process for flagging balancing services, National Grid will promptly seek to establish a revised Statement incorporating the changes in accordance with paragraphs 8(a) and 8(b) of Standard Condition C16 of the Transmission Licence (the Licence).

In the event that it is necessary to modify this Statement in advance of issuing an updated version of this document, then this will be done by issuing a supplement to this Statement.

The latest version of this document is available, together with the relevant change marked version (if any), electronically from the National Grid Website;

http://www.nationalgrid.com/uk/Electricity/Balancing/transmissionlicencestatements/

Field Code C

Alternatively a copy may be requested from:

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Field Code C

CONTENTS

PART A: INTRODUCTION

1. Purpose of document

The purpose of this Statement is to set out the means which the licensee will use to identify (using reasonable endeavours) balancing services that are for system management reasons.

In the event that it is necessary to modify this Statement in advance of issuing an updated version of this document, this will be done by issuing a supplement to this Statement.

This Statement refers to a number of definitions contained in each of the Grid Code, the Balancing and Settlement Code, and the Licence. In the event that any of the relevant provisions in the Grid Code, the Balancing and Settlement Code or the Licence are amended, it may become necessary for National Grid to modify this Statement so that it remains consistent with the Grid Code, the Balancing and Settlement Code, and the Licence.

In any event, where National Grid's licence or statutory obligations or the provisions of the Grid Code or Balancing and Settlement Code are considered inconsistent with any part of this Statement, then the relevant licence or statutory obligation or code provision will take precedence.

Unless defined in this Statement, terms used herein shall have the same meanings given to them in the Transmission Licence, the Grid Code and/or the Balancing and Settlement Code as the case may be.

PART B: Flagging

1. Background to SO-Flagging

Balancing Settlement Code

From the 5th November 2009, under Section Q 5.3.1 (d) and Section Q 6.3.2 (b) (iii) of the Balancing and Settlement Code, National Grid is required to determine which balancing services should be classified as SO-Flagged.

To that end, National Grid will determine which balancing services have been taken for system management reasons and will subsequently classify the appropriate services as SO-Flagged.

System Management

System Management means:

1. any balancing service used by National Grid that partially or wholly resolves a transmission constraint;
2. any system-to-system balancing service used by National Grid in respect of electricity flows over an interconnector, to avoid adverse effects arising on the National Electricity Transmission System from significant load profile changes;
3. any system-to-system balancing service used by a Transmission System Operator (TSO) other than National Grid, for the purposes of resolving a system operation issue in a connected transmission system;
4. any balancing action used to despatch the Supplemental Balancing Reserve service whether through or outside the Balancing Mechanism or any balancing action used to call off Demand Side Balancing Reserve (DSBR).

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Transmission Constraints

Transmission constraints and the processes National Grid employs to resolve them are discussed in Part D of this document. However, in summary, transmission constraint occurs when there is a limit on the ability of the national electricity transmission system, or any part of it, to transmit the power supplied onto the national electricity transmission system to the location of demand. Any balancing service taken by National Grid in order to avoid power flow exceeding a limit will be considered as resolving a transmission constraint.

2. The balancing services that will be SO-Flagged

Balancing services are defined in the Procurement Guidelines which National Grid is required to establish in accordance with Standard Condition C16 of the licence. The purpose of the Procurement Guidelines is to set out the kind of balancing services which National Grid may be interested in purchasing in the role of System Operator (SO), together with the mechanism by which National Grid envisages purchasing such balancing services.

The following balancing services will be assessed to determine which of them were used for system management reasons, and consequently, should be SO-Flagged:

Forward Contracts

The following forward-trading actions will be assessed in accordance with the System Management Action Flagging Methodology:

- energy related products;
- pre gate balancing transactions (PGBTs); and
- system-to-system services.

Bid-Offer Acceptances

All Bid-Offer Acceptances (BOAs) taken within the Balancing Mechanism (BM) in relation to Balancing Mechanism Units (BMUs) will be considered, to determine whether they were used for system management reasons.

Option Contracts

BM Start-Up option contracts used by National Grid to facilitate access to energy from BMUs that would not have otherwise run and are unable to start up within BM timescales, will be assessed in accordance with the System Management Action Flagging Methodology.

Where National Grid determines that a BM Start-Up option contract has been taken for the purposes of system management, the associated costs will not be included within the Buy Price Adjuster (BPA) of the Balancing Service Adjustment Data (BSAD).

Emergency Instructions

In certain circumstances, National Grid may need to take emergency actions which exceed the bids and offers available to it in the BM in order to maintain the integrity of the transmission network in accordance with BC2.9 of the Grid Code. If such action is taken, National Grid will analyse the action post event and determine the energy profile of the emergency action. National Grid will then determine whether these actions are taken for system management reasons. In instances where Emergency Instructions have been used for system management reasons National Grid will classify the resulting Acceptances as Emergency Flagged. For the avoidance of doubt, there is no difference in the meaning of system management for Emergency Instructions.

Emergency Deenergisation Instructions

There is one form of emergency action that will always be classified as being for system management reasons and will consequentially always be SO-

Flagged – Emergency Deenergisation Instructions. Instructions to de-synchronise and deenergise Generating Unit(s) will be issued by National Grid in accordance with Section 5.2 of the CUSC.

However, as such energy volumes associated with Emergency Deenergisation Instructions are administered through the CUSC, and not open to the 'pay as bid' approach of the BM, these energy volumes will be provided through BSAD as an unpriced volume.

System to Generator Operational Intertripping

The System to Generator Operational Intertripping service may, in certain circumstances, result in the automatic tripping of Generating Units(s). The contract details associated with a System to Generator Operational Intertripping scheme are contained in section 4.2A of the CUSC. This is considered to be a system management service and will consequently be SO-Flagged. However, this service is administered through the CUSC and therefore such energy volumes will be provided through BSAD as unpriced volumes.

Commercial Intertrips

The commercial intertrip service may, in certain circumstances, result in the automatic tripping of Generating Units(s). The use of such a service will always be for system management reasons and SO-Flagged accordingly. However, the energy volume provided through BSAD will be unpriced as the service is not contracted on a £/MWh basis.

Commercial Fast De-Load Service

The Commercial Fast De-load service may, in certain circumstances, result in the automatic tripping of Generating Units(s). The use of such a service will always be for system management reasons and SO-Flagged accordingly. However, the energy volume provided through BSAD will be unpriced as the service is not contracted on a £/MWh basis.

Black Start Warming

BOAs issued to BMUs that are warmed and run to maintain Black Start capability should be SO-Flagged. For the avoidance of doubt, all BM Start-Up instructions including, instructions associated with Black Start warming are accounted for within the Balancing Services Adjustment Data (BSAD) Methodology Statement**.**

3. Flagging forward trades and Bid Offer Acceptances

There is a distinction between how National Grid will flag balancing services taken in the forward market and those taken in the BM.

Individual balancing services actions used outside the BM for system management reasons will be SO-Flagged at inception in accordance with the principles set out above. This includes any system-to-system balancing services. Information on whether or not such balancing services have been SO-Flagged will be contained within the BSAD and submitted in accordance with the BSAD methodology statement.

However, due to the demands of real time power system management, it is not practicable to manage the SO-Flagging of BOAs in the same way. Therefore, in real time, National Grid will identify BMUs that are being used to manage transmission constraints, and any BOAs taken on those units will be automatically SO-Flagged. For the avoidance of doubt, if the use of the BMU has not been assessed as resolving a transmission constraint, any associated BOA will not be SO-Flagged. Whether such balancing services are SO-Flagged will be contained within the Acceptance Data in accordance with Section Q, Paragraph 5.3 of the Balancing Settlement Code.

PART C: Other Issues

1. Flagging methodology accuracy

National Grid considers the flagging methodology described within this document to be a pragmatic solution that will accurately identify the majority of transmission constraints. However, there may, on occasion, be actions that resolve transmission constraints that are not correctly identified by the System Operator. Conversely there may be instances where National Grid incorrectly identifies an action as resolving a transmission constraint.

Where there has been an incorrect SO-Flag applied to any balancing service taken outside of the BM, National Grid will promptly amend the SO-Flag in accordance with the existing BSAD provisions (section Q, paragraph 6.3 of the Balancing and Settlement Code). However, National Grid will not amend incorrect SO-Flags applied to BOAs.

In order to provide continued confidence to the industry, National Grid will report annually, as a minimum, on the accuracy of the flagging methodology.

2. Failure of Balancing Mechanism System and backup

There may, under exceptional circumstances, be occasions when National Grid's ability to flag balancing services it has taken for system management reasons will be reduced.

On occasions when the BM system (main system) is unavailable and National Grid is using its back up system, there may be a reduction in the general level of accuracy of National Grid's SO-Flagging. Any loss of accuracy will be due to the increased burden upon National Grid to maintain the integrity of the transmission system, resulting from utilising a back up system with less functionality than the main system.

In addition, in the unlikely event that there is a simultaneous failure of the main system and the back up system, National Grid will not be able to engage in SO-

Flagging since the loss of both systems would make it impractical to undertake this activity.

3. Modifications to the methodology statement

National Grid will review the System Management Action Flagging Methodology should there be any significant changes to the information systems used, the processes employed by National Grid to manage transmission constraints, or any other change that in National Grid's view will have an impact on the effectiveness the methodology. National Grid will also review the System Management Action Flagging Methodology should the Authority direct National Grid to do so.

National Grid will seek to revise this Statement in accordance with paragraph 8 of Standard Condition C16 (Procurement and use of balancing services) of the licence should a modification be required.

PART D: TRANSMISSION CONSTRAINTS

1. Definition of transmission constraint

Any balancing service that partially or wholly resolves a transmission constraint will be classified as a system management action and SO-Flagged.

A transmission constraint is defined as: any limit on the ability of the national electricity transmission system, or any part of it, to transmit the power supplied onto the national electricity transmission system to the location where the demand for that power is situated, such limit arising as a result of any one or more of:

(a) the need not to exceed the thermal rating of any asset forming part of the national electricity transmission system;

(b) the need to maintain voltages on the national electricity transmission system; and

(c) the need to maintain the transient and dynamic stability of electrical plant, equipment and systems directly or indirectly connected to the national electricity transmission system.

and used by National Grid to operate the national electricity transmission system in accordance with the National Electricity Transmission System Security and Quality of Supply Standard referred to in standard condition C17.

2. Transmission constraint management process

National Grid has determined that the System Management Action Flagging Methodology should be incorporated within National Grid's existing transmission constraint management process. Therefore the following section briefly outlines the transmission constraint process and highlights when SO-Flagging will occur within it. However, it should be noted that the intention is not to provide a definitive description of the transmission constraint process but rather provide a context for the SO-Flagging process. A detailed description of the transmission constraint process can be found in National Grid's Balancing Principles Statement.

This process is summarised in Chart A below.

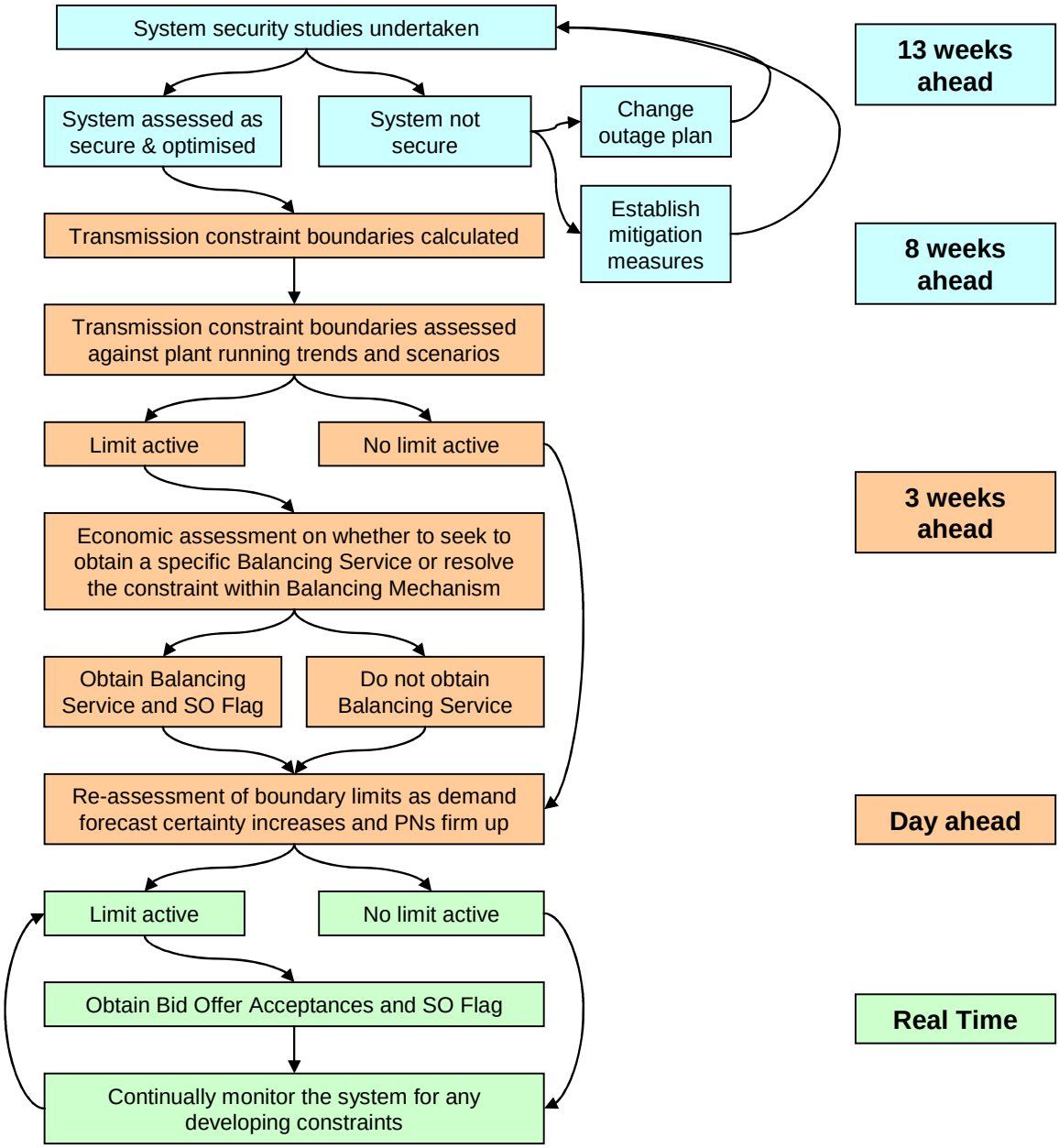

Chart A

3. Transmission constraint management description

The following is a description of the transmission constraint management and flagging process illustrated above.

In “year ahead” timescales, National Grid seeks to minimise transmission constraints through careful planning of transmission outages. Transmission constraints are calculated and optimised as necessary from thirteen (13) weeks ahead, down to day ahead timescales and in pre Gate Closure control phase, with the objective of ensuring system security at the minimum cost while meeting National Grid’s system maintenance and construction requirements:

Step 1 Using National Grid’s forecast of demand, BMU availability/running, BMU prices and the transmission outage plan, system security analysis studies are undertaken. These studies involve the use of system analysis models that can determine system voltage, thermal, and stability conditions.

Step 2 From these studies, system security is assessed. If security can not be achieved, the outage plan will be reviewed and revised accordingly.

Step 3 Transmission constraint boundaries will be identified and further studies will be undertaken to calculate the limits of the acceptable power flows across the boundaries in accordance with the GB Security and Quality of Supply Standard.

Step 4 At the day ahead stage, following receipt of the initial Physical Notification data, an economic assessment on whether to obtain a specific balancing service in the forward market, or in the BM is undertaken to deal with any forecast transmission constraints. If it is economic and efficient to obtain such a service in the forward market, the balancing service will be SO-Flagged when it is purchased.

Control Phase – Pre Gate Closure

Step 5 National Grid will undertake further security analysis studies as it gains greater certainty as to likely system conditions, through demand forecasts and generator Physical Notifications.

Step 6 The outcome of these studies could result in National Grid making further use of balancing services, through either BM Start-Up or PGBTs. Whether this is appropriate will depend upon the options available to National Grid to resolve the constraint and the most economically efficient choice. In the event that a balancing service is used, the action will be identified as SO-Flagged at the point of purchase.

Control Phase – Real Time

Step 7 System security is continually monitored in real time through the use of on-line system security analysis studies based on actual system conditions.

Step 8 BMUs offering BOAs that could be purchased should a transmission constraint materialise in real time are identified. National Grid will flag the relevant BMUs.

Step 10 Any BOAs subsequently purchased on the flagged BMUs will automatically be identified as SO-Flagged.