System Management Action Flagging Methodology Statement

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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
01.01.14	4.0	Revision to incorporate Supplemental Balancing Reserve and Demand Side Balancing Reserve
01.04.14	5.0	Revision to incorporate the ability to make retrospective changes to the system flagging for BOAs as part of the annual review.
05.11.15	6.0	Revisions: to include actions to manage RoCoF and Fault Levels; to include automatic Low Frequency Demand Disconnection actions; to incorporate changes to the treatment of Supplemental Balancing Reserve and Demand Side Balancing Reserve.
05.11.15	7.0	Revision to incorporate treatment of scenario where SBR units have a SEL equal to their MEL
01.04.16	8.0	Revision following annual review
01.04.17	9.0	**Revision to remove Demand Side Balancing Reserve**
1.04.18	10.0	Revision following annual review
01.04.19	11.0	Revision following annual review

The System Management Action Flagging Methodology Statement has been developed by National Grid Electricity System Operator Limited ~~Transmission plc~~ (NGESO~~ational Grid~~).

Where NGESO~~ational Grid~~ amends the process for flagging balancing services, ~~National Grid~~NGESO 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 ESO Website:

https://www.nationalgrideso.com/balancing-services/c16-statements-and-consultations

~~**https://www.nationalgrid.com/uk/electricity/market-operations-and-data/transmission-licence-c16-statements-and-consultations**~~

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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 NGESO~~ational 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 NGESO~~ational 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~~NGESO is required to determine which balancing services should be classified as SO-Flagged.

To that end, ~~National Grid~~NGESO 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~~NGESO that partially or wholly resolves a transmission constraint;
2. any system-to-system balancing service used by ~~National Grid~~NGESO 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 NGESO~~ational Grid~~, for the purposes of resolving a system operation issue in a connected transmission system;
4. any balancing action used by ~~National Grid~~NGESO primarily to manage the Rate of Change of Frequency (RoCoF) or to manage Fault Levels;
5. any automatic Low Frequency Demand Disconnection relay demand control action.

Transmission Constraints

Transmission constraints and the processes NGESO ~~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 NGESO ~~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 NGESO~~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~~NGESO may be interested in purchasing ~~in the role of System Operator (SO)~~, together with the mechanism by which ~~National Grid~~NGESO 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; and
- ~~pre gate balancing transactions (PGBTs); and~~

- system-to-system services.

Bid-Offer Acceptances

All Bid-Offer Acceptances (BOAs) taken within the Balancing Mechanism (BM) including Replacement Reserves Acceptances 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~~NGESO 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~~NGESO 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~~NGESO 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~~NGESO will analyse the action post event and determine the energy profile of the emergency action. ~~National Grid~~NGESO 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~~NGESO 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

Emergency Deenergisation Instructions will always be classified as being for system management reasons and will consequentially always be SO-Flagged. Instructions to de-synchronise and deenergise Generating Unit(s) will be issued by ~~National Grid~~NGESO 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.

Automatic Low Frequency Demand Disconnection (LFDD) actions

Automatic LFDD incidents will always be classified as occurring for system management reasons and as such will always be SO-Flagged. From 5 November 2015, automatic LFDD events will be notified by ~~National Grid~~NGESO as system warnings and published to the BMRS.

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~~NGESO 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~~NGESO 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~~NGESO 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~~NGESO 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~~NGESO will promptly amend the SO-Flag in accordance with the existing BSAD provisions (section Q, paragraph 6.3 of the Balancing and Settlement Code).

Where there has been an incorrect SO-flag applied to any BOA, ~~National Grid~~NGESO will retrospectively amend the flag, in accordance with BSCP18, whenever:

1. A Data Inquiry Report (DIR) is raised by NGESO~~ational Grid~~'s Electricity National Control Centre (ENCC); or
2. A discrepancy is observed during the post-event constraint tagging process and confirmed as being the result of incorrect flagging.

In order to provide continued confidence to the industry, ~~National Grid~~NGESO 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~~ NGESO'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~~ NGESO is using its back up system, there may be a reduction in the

general level of accuracy of ~~National Grid's~~NGESO's SO-Flagging. Any loss of accuracy will be due to the increased burden upon ~~National Grid~~NGESO 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~~NGESO 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~~NGESO 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~~NGESO to manage transmission constraints, or any other change that in ~~National Grid's~~NGESO's view will have an impact on the effectiveness the methodology. ~~National Grid~~NGESO will also review the System Management Action Flagging Methodology should the Authority direct ~~National Grid~~NGESO to do so.

~~National Grid~~NGESO 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~~NGESO 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~~NGESO has determined that the System Management Action Flagging Methodology should be incorporated within ~~National Grid's~~NGESO'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~~ NGESO's Balancing Principles Statement.

This process is summarised in Chart A below.

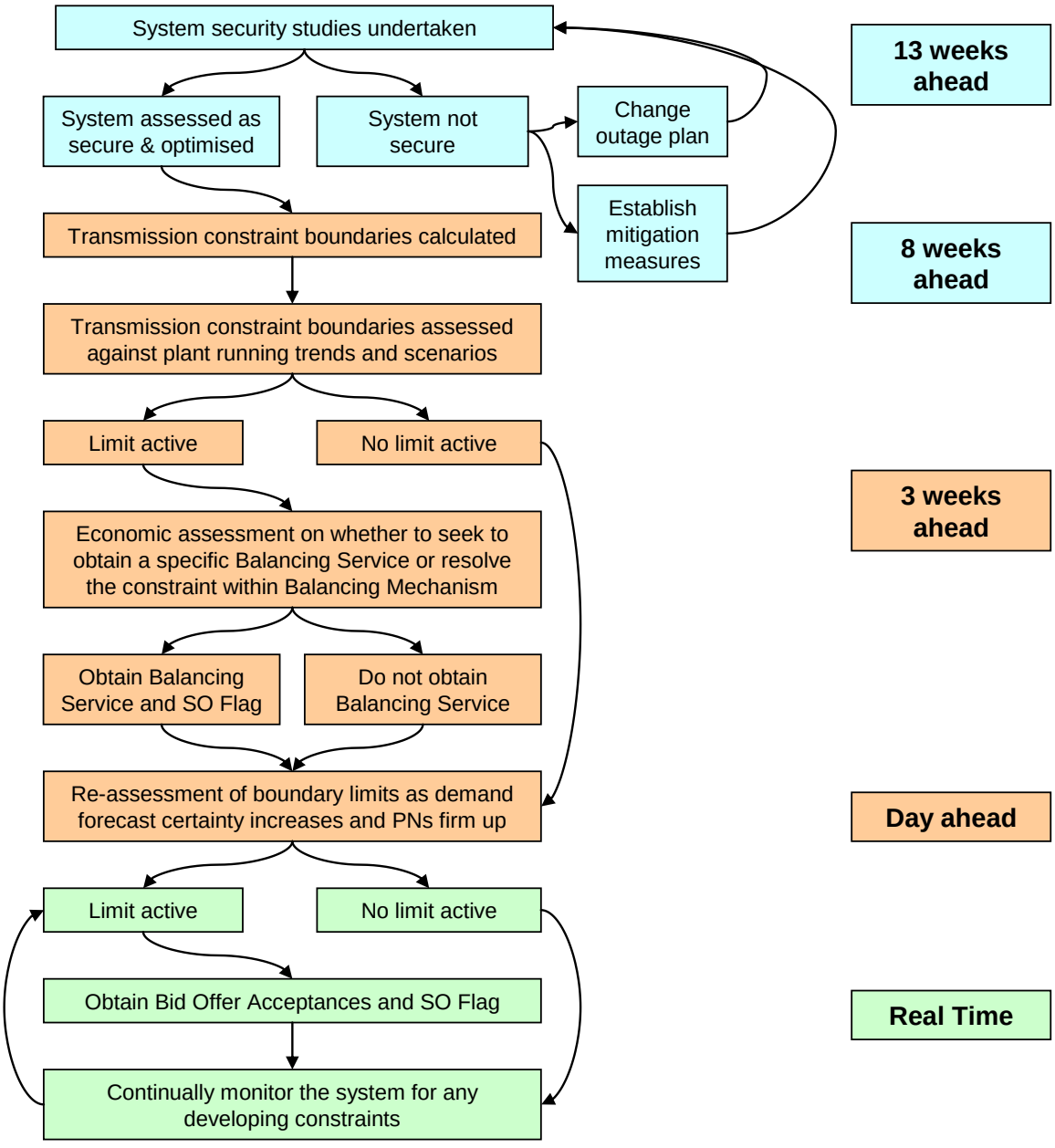


Chart A

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~~NGESO 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~~NGESO's system maintenance and construction requirements:

Step 1 Using ~~National Grid's~~NGESO'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~~NGESO 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~~NGESO 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~~NGESO 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~~NGESO will flag the relevant BMUs.

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