nationalgrid

2014/15 Operating Margins Statement

v1.0

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1 About this Document

National Grid Gas purchases Operating Margins (OM) on an annual basis in line with both the Uniform Network Code (UNC)[1] and obligations described in the National Grid Gas Safety Case in respect of the NTS (the Safety Case). The Safety Case places an obligation on National Grid Gas to maintain OM at levels and locations determined throughout the year.

The OM service is used to maintain system pressures in the period before other system management services become effective (e.g. national or locational balancing actions). A further quantity of OM is also procured to manage the orderly run-down of the system in the event of a Network Gas Supply Emergency (NGSE) whilst firm load shedding takes place.

This document is published pursuant to National Grid's obligations under the UNC, which requires National Grid to publish the following information:

- The assumptions used in the determining Operating Margins Requirements
- The aggregate amount of Operating Margins
- The maximum rate of deliverability required for Operating Margins
- The Operating Margins profile

The terms and conditions of the UNC apply to the contents of the document.

The resultant Operating Margins booking also meets National Grid Gas requirements to conform to its current Safety Case.

For information on Operating Margins, including on becoming an OM provider please take a look at our website at:
http://www2.nationalgrid.com/uk/industry-information/gas-transmission-system-operations/balancing/operating-margins/

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[1] This document is published pursuant to National Grid's obligations under Part 2.2.3 of Section K of the Transportation Principle Document of the UNC.

2 Background Information

2.1 Use of Operating Margins

The criteria for the use of Operating Margins are set out in the System Management Principles Statement available at http://www2.nationalgrid.com/UK/Industry-information/Business-compliance/Procurement-and-System-Management-Documents/.

2.1.1 Triggers for the use of Operating Margins

The triggers for the use of Operating Margins are as follows:-

1. Primarily, Operating Margins will be used in the immediate period following operational stresses such as beach supply failure as a result of a failure offshore, unanticipated demand changes or unexpected pipeline and/or plant unavailability to maintain system pressures in the period before other balancing measures become effective.

2. Orderly Rundown requires a quantity of Operating Margins stock to ensure safe rundown of the system in the event of a Network Gas Supply Emergency while firm load shedding takes place as required in our Safety Case.

3. Operating Margins will also be used to support system pressures on the gas day in the event of a compressor trip, pipe break, or other failure or damage to transmission plant. Following the day of the event, any reduction in capacity resulting from the event becomes equivalent to a planned maintenance activity, and therefore is unlikely to be supported by the use of Operating Margins.

2.1.2 Refilling of Operating Margins

If the volume of Operating Margins, at any point in the winter, falls below the monitor level calculated by National Grid at individual sites, National Grid may seek to refill Operating Margins to the extent of the published monitor where it is practical to do so.

2.2 Safety Case Operating Margins Requirements

Besides meeting our Uniform Network Code requirements for Operating Margins, the Operating Margins booking must also satisfy our current Safety Case requirements for Operating Margins. These are broadly similar and for reporting purposes we use terminology that is consistent with our Safety Case definitions for Operating Margins.

3 Overview of the Operating Margins methodology

National Grid has determined its Operating Margins requirement by consideration of all available storage facilities, LNG importation facilities, direct connected loads and supplies on the NTS.

National Grid Gas procures Operating Margins services from storage and importation facilities and their capacity holders as well as offtake reduction and supply increase services rather than from specific storage facilities. To that end, National Grid Gas has recently completed a tender to procure storage capacity and gas delivery offers.

The philosophy behind this year's methodology is consistent with that used last year, with the total booking being split between Group 1, Group 2 and Group 3 as broadly defined in our Safety Case.

GROUP 1 – Beach supply failure and forecast demand change

GROUP 2 – Compressor failure and pipeline failure

GROUP 3 - Orderly Rundown

Operating Margins is primarily calculated by network analysis of the system and to a lesser extent by using various analytical models. Section 4 provides a more detailed explanation of the calculation of the individual elements.

4 Assumptions used in the determination of Operating Margins

4.1 Assumptions used in the Operating Margins calculations

1. Other storage, NTS compressors and pipelines have 100% availability (apart from the specific failure condition being considered).

2. Relevant facilities respond within 2 hours of an event being confirmed.

3. If operating conditions require Operating Margins stocks to be depleted they may be refilled[2] to the stock profile shown in Section 7.

4. The OM space requirement in each group is the highest OM space requirement of all the operating conditions at each storage location.

5. The aggregate group space requirement is the sum of the individual locational space requirements.

4.1.1 Operating Margins requirements for Group 1

The determination of the requirements for Group 1, include assessment of the loss of largest single point supply to the NTS based on typical locational historic flows.

Group 1 Operating Margins requirement is calculated by network analysis of the system.

4.1.2 Operating Margins requirements for Group 2

The requirements for Group 2 include compressor failures and pipeline failures. The operating conditions have been grouped so that the Operating Margins volume and deliverability for this group will satisfy any of the operating conditions of the group individually but not necessarily simultaneously.

Group 2 Operating Margins requirement is calculated by network analysis of the system with the most severe impacting scenario of compressor failure or pipeline failure being applied to the network and by using a range of analytical models using historic and forecast data.

4.1.2.1 NTS Compressor failure assumptions

1. Full compressor station failure will be considered.

[1] This may need to be effected by transfer of gas in store if there is limited injection capacity.

2. The failed compressor station will be unavailable for use for at least 24 hours.

3. Compressor reliability, running hours, asset age, location with respect to vulnerable areas of the NTS, impact of loss were all considered when deciding the particular event to be analysed.

4.1.2.2 Pipeline Failure Assumptions

1. The failed section of pipeline will be unavailable for use for at least 24 hours.

2. Asset age, location with respect to vulnerable areas of the NTS, and overall impact of the pipeline failure were considered.

4.1.3 Operating Margins requirement for Group 3

Orderly rundown is Operating Margins stock to ensure safe rundown of the system in the event of a Network Gas Supply Emergency while firm load shedding takes place as required in our Safety Case.

4.1.3.1 Orderly rundown assumptions

1. Severe winter has been experienced, no shipper storage available from 06:00 hours and no shipper firm load reduction.

2. A Network Gas Supply Emergency is declared effective from 06:00 hours and firm load shedding of VLDMCs and LDZ DM loads is required to balance supply and demand.

3. NTS linepack is used to smooth out the mis-match between supply and demand within day, but is limited to +/- 10mcm.

4. With no shipper storage available, the within day supply shortfall is assumed to be met by a combination of Operating Margins booked in Long Range Storage, Medium Range Storage, Short Range Storage and LNG Importation facilities with storage.

5. As detailed in Section 3, this assessment may change or be expanded following engagement with the Distribution Networks about their role in assisting the orderly rundown.

4.2 Post-Tender Operating Margins Requirements

Following the tender process, responses have been collated and the total quantities have been re-assessed and compiled based on the profiles of stock and deliverability provided in the submitted tenders (please see section 6).

5 Isle of Grain Operating Margins Requirements

National Grid continues to book some Operating Margins at Grain LNG.

6 Aggregate Operating Margins booking 2014/15

Table 1 below summarises the expected bookings required from the regulated LNG Storage facilities and all other service providers as a result of the competitive tender process. This was completed in early 2014 and forms part of National Grid's overall procurement process.

The aggregated Operating Margins booking for 2014/15 is 1,163 GWh.

Table 1: 2014/15 Operating Margins Booking

	2013/14 Space Booking (GWh)	**2014/15 Space Booking (GWh)**	2014/15 Max Deliverability (GWh/d)
Avonmouth	115	**210***	125.3*
All other providers	975	**953**	
Total	1,090	**1,163**	

* The Avonmouth booking is currently indicative subject to execution of the UNC pre-emption rights

This booking explicitly meets our UNC and Safety Case obligations.

Further detail on the 2014/15 Operating Margins tender will be published later this year at:
http://www2.nationalgrid.com/uk/industry-information/gas-transmission-system-operations/balancing/operating-margins/

6.1 The maximum rate of deliverability required for Operating Margins

The combination of the aggregated LNG deliverability in Table 1, combined with that from other providers, meets the calculated maximum Operating Margins deliverability requirement. To reduce costs and to reflect at high demand that many of these sites are expected to be flowing gas, we will not be booking any site deliverability. Hence we will use interruptible deliverability or over-run deliverability on the day of use.

7 The Operating Margins profile

Table 2 below shows the Operating Margins profile, the quantity of gas required in store for each month of the year. Though not shown the storage profiles can be site specific reflecting their individual Operating Margins needs.

The profiles are generated based on the likelihood of the scenario requiring the use of each group of Operating Margins for that time of year, with proportions of groups being calculated from energy forecasting assumptions of demand and supply.

Table 2: 2014/15 Operating Margin Profile

	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Monitor (GWh)	489	489	489	489	489	1163	1163	1163	1156	1043	970	489
Monitor (%)	42%	42%	42%	42%	42%	100%	100%	100%	99%	90%	83%	42%

8 Operating Margins WACOG Calculation Principles

In accordance with Sections K4.2.3(b) and K4.2.6(b) of the UNC, National Grid Gas must publish the principles by which the Operating Margins WACOG and Net Margins WACOG, will be calculated in relation to facilities where National Grid Gas has entered into Operating Margins Gas Delivery Arrangements.

Deliverability Contract 2014-1 to 2014-4

The Margins WACOG in respect of Deliverability Contracts 2014-1 to 2014-4 are of the form:

DC = max (SMPB + [A], [B])

Where:

SMPB represents the System Marginal Sell Price (in p/kWh) for gas for the Gas Day in which the service has been delivered

[A] and [B] are user defined parameters

Deliverability Contract 2014-5

The Margins WACOG in respect of Deliverability Contract 2014-5 is of the form:

$\{\sum \text{Max}[(SBPi * [A] - SMSPi), 0)] * Qi\} / \sum Qi$

Where:

$\sum$ represents the sum over all hours within the Gas Day in which the service has been delivered

SBPi = The average System Buy Price for electricity determined by the two relevant settlement periods within the Hour i as published in the final settlement report (£/kWh)

SMSPi = The System Marginal Sell Price for gas for the Gas Day in which the Hour occurs (£/kWh)

Qi is the Actual Utilisation Quantity (kWh) delivered in the Hour i

[A] is a user defined parameter

Deliverability Contract 2014-TSA

The Margins WACOG in respect of Deliverability Contract 2014-TSA is of the form:

DC = DQ * DGP

Where:

DC is the Margins WACOG

DQ is the quantity delivered (in GWh) to National Grid Gas pursuant to the Operating Margins Gas Delivery Arrangements on the day in question:

DGP is the greater of:

a price (in GBP/GWh) calculated as the average of the three highest System Average Prices (in GBP/GWh) in the five Days immediately after the date on which the delivery occurred, minus the average of System Entry Capacity Charges applicable in respect of the Gas Delivery point in the same period;

And

the weighted average of the System Average Price (in GBP/GWh) in the three hundred and sixty-five Days immediately before the date on which the delivery occurred, minus the average of System Entry Capacity Charges (in GBP/GWh) applicable in respect of the Gas Delivery Point in the same period.