Preliminary Safety & Firm Monitor Requirements 2010/11

31st May 2010

Introduction

This document sets out 'Safety Monitors' and 'Firm Gas Monitors' for the 2010/11 winter, pursuant to National Grid's obligations under the Uniform Network Code Section Q.

It is National Grid's responsibility to keep the monitors under review (both ahead of and throughout the winter) and to make adjustments if it is appropriate to do so on the basis of the information available to us. In doing so, we must recognise that the purpose of the safety monitors is to ensure an adequate pressure can be maintained in the network at all times and thereby protect public safety.

Following winter 2008/9, we reviewed the safety monitor methodology and made a number of revisions to the calculation of the monitor and enhancements to the dissemination of safety monitor information throughout the winter. We believe that these changes have:

- Improved information provision to the market with respect to safety monitor requirements
- Enabled the market to operate more effectively, as there will be greater clarity regarding the necessary safety monitor space and deliverability requirements
- Enhanced Security of Supply and the market's ability to plan and thereby efficiently deal with supply "shocks"

It should be noted that these changes did not increase the total safety monitor storage requirement.

Following winter 2009/10 we intend to make an additional revision to the safety monitor calculation methodology and also provide additional information to the marketplace with respect to the potential impact of a supply shock.

Our Winter Consultation Report 2010/11 which will be published in June will present an initial view of demand and supplies for the coming winter. It will highlight continuing uncertainty with regard to potential non-storage supply levels, notably for imports.

The preliminary safety monitors shown here use our 2010 demand forecasts produced in May 2010 and our provisional 2010 supply forecasts which incorporate supply and demand information provided to us by market participants through our 2010 Transporting Britain's Energy (TBE) consultation process. We expect to update our safety monitor analysis to include any further feedback that we receive via the winter 2009/10 consultation process.

National Grid will also continue to provide within winter feedback to industry regarding supply assumptions and any resulting changes to safety monitors by means of monthly updates via Operational Forums and information on our web site.

The firm gas monitors represent the storage levels required to support firm demand in a severe winter. They are published for information only.

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We would welcome views on the appropriate basis for setting the 2010/11 safety monitors and request that market participants respond to our winter 2010/11 consultation process to assist us in developing our final safety monitor determination in September.

Background

The Uniform Network Code (UNC) (inter alia) requires us to publish the safety monitors and to provide regular reporting of actual storage stock levels for comparison with these monitors. As the name suggests, the focus of the safety monitors is public safety rather than security of supply. They provide a trigger mechanism for taking direct action to avoid a potential gas supply emergency (as defined in the Gas Safety (Management) Regulations).

In addition, the UNC requires us to calculate and publish firm gas monitors based upon the forecast demands of firm consumers. The firm gas monitors are published solely for the purpose of providing further information to the market.

Methodology

Following winter 2008/9, we reviewed the safety monitor methodology and made a number of revisions to the calculation of the monitor and enhancements to the dissemination of safety monitor information throughout the winter.

The revised methodology calculates the total safety monitor storage space requirement as a single entity rather than broken down into Long, Medium and Short storage requirements. This results in the production of a single safety monitor. In addition a safety monitor deliverability requirement is calculated. There are a number of benefits to adopting this approach:

- The creation of a Total Safety Monitor classification that aggregates all safety monitor storage space requirements ensures that all storage facilities are treated equitably
- The production of a deliverability monitor alongside the space monitor provides the marketplace with greater information in terms of the overall capability of available storage facilities and hence enhance security of supply by more accurately reflecting the likely changes in overall storage capability during the course of the winter should certain storage facilities be exhausted

Whilst the Total Safety Monitor storage space requirement has replaced the Long, Medium and Short safety monitor requirements, these classifications of storage are kept for stock reporting purposes. These revisions to the safety monitor methodology have resulted in an increase in relevant information available to the market.

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There continues to be two main steps in the assessment of the safety and firm gas monitors:

- The calculation of the total storage requirement at the start of the winter
- The assessment of the way in which this initial requirement decays as the winter progresses, known as the winter profile. This second step has been expanded to include an assessment of how the total storage deliverability requirement also decays as the winter progresses.

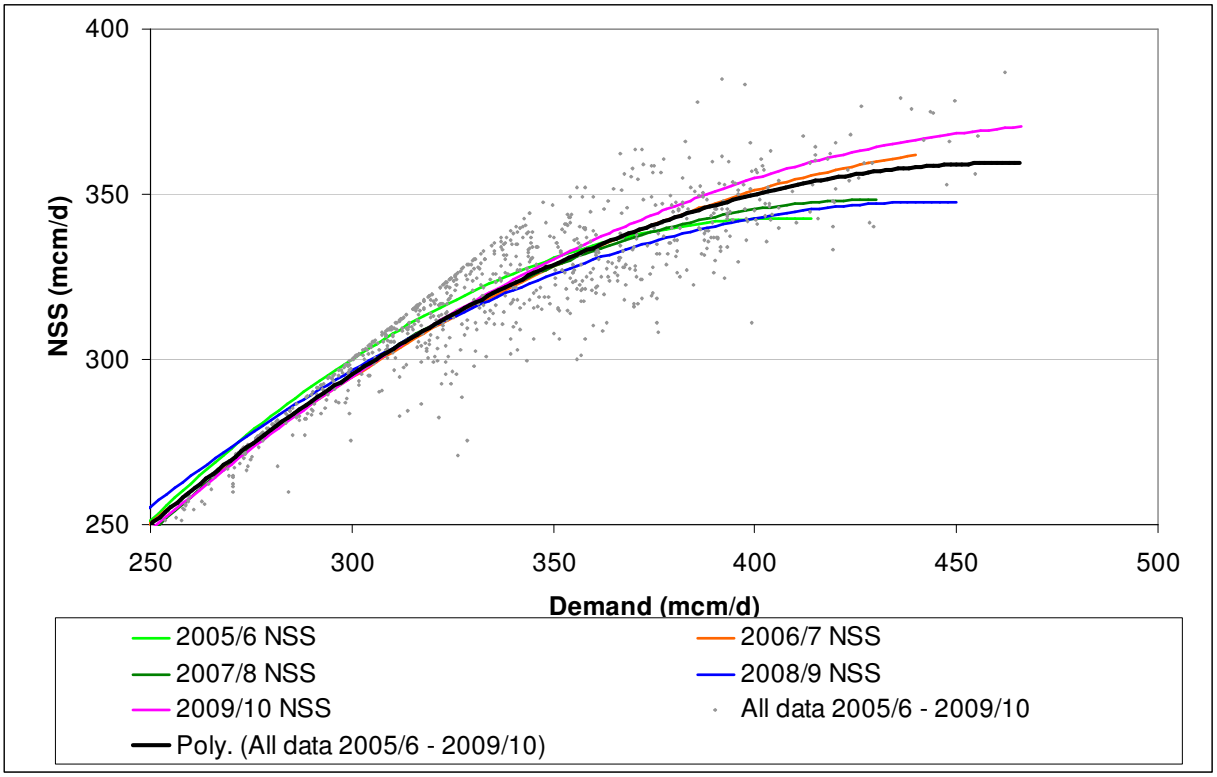
This note only covers the first step, by providing a preliminary assessment of the safety monitor space requirement. The safety monitor requirement is highly dependent on the assumptions made regarding the aggregate non storage supply level. In June we will be consulting on the likely non storage supplies we may see this coming winter. Once the winter consultation process is complete, we will publish the final Safety Monitor and Firm Gas Requirements in September, including the safety monitor storage space requirement winter profile and the deliverability requirement.

Proposed revisions to Methodology

1. Variable Non Storage Supply assumption

As stated previously, the safety monitor space requirement is highly dependant on the non storage supply (NSS) level. Previously, the safety monitor methodology has assumed a single figure for NSS which applies for all days within the winter, i.e. the value of NSS is independent of demand. In reality NSS levels increase with increasing demand. This can be seen in Figure 1, which shows trend lines for NSS versus demand for winters 2005/6 to 2009/10. An aggregated trend line for all five winters worth of data is also shown.

Figure 1 – NSS v demand relationship for winters 2005/6 to 2009/10



It is proposed that the shape (not the values) of the aggregated trend line forms the basis for the NSS versus demand relationship for calculating the 2010/11 safety monitor.

This approach, whilst not having a significant impact on the overall level of the safety monitor does have a number of benefits:

- It represents a more realistic approach to the relationship between supply and demand
- Within winter monitoring of actual NSS levels will enable us to determine whether the NSS v demand relationship used within the safety monitor calculation methodology is fit for purpose: if it is found not to be, it can be revised based on the latest information

2. Impact of supply shock

As the safety monitor requirement is so heavily dependent on NSS levels, any significant sustained supply shock will result in a significant increase in the safety monitor requirement. This year in an effort to provide the marketplace with some additional information regarding the potential impact of supply shock, we intend to publish, for information only, an indicative safety monitor requirement for a NSS with a sustained 50 mcm/d supply loss. It must be stressed that the 50 mcm/d supply shock safety monitor will be published for information only, just as the firm monitor is. However this additional monitor does reflect the consequences of increased storage requirements should a sustained supply loss materialise.

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Safety Monitor Calculation Process

The concept behind the safety monitors is to ensure that sufficient gas is held in storage to support those gas consumers whose premises cannot be physically and verifiably isolated from the gas network within a reasonable time period. To achieve this all gas consumers are categorised into one of two groups:

- Protected by Monitor - Gas is held in storage to facilitate continuity of supply to these consumers even in a 1 in 50 winter
- Protected by Isolation – Network safety would be maintained if necessary by physically isolating these customers from the network

The categorisation into these groups (accepted by the HS&E as part of the National Grid Gas Safety Case revision) is summarised in the table below:

Table 1: End Consumer Categorisation for Safety Monitors

Protected by Isolation - Sites which can be safely isolated from the network	**Protected by Monitor** - Sites which require protection under the safety monitor
NTS Interruptibles	Priority[1] Firm DM
LDZ Interruptibles	Ireland Firm
NTS Power Firm	>5860 MWh NDM
NTS Industrial Firm	2196-5860 MWh NDM
DM (excluding priority customers)	732-2196 MWh NDM
	73-732 MWh NDM
	0-73 MWh NDM

The safety monitor storage requirements comprise two elements:

- **Supply-demand**: Storage required to support 'protected by monitor' loads, assessed using a severe (1 in 50) winter load duration curve and assumed supply levels;

- **Isolation**: Storage required during the process of demand reduction, effectively to support 'protected by isolation' loads during the period in which these loads would be isolated from the system.

Supply

There is considerable uncertainty regarding the make up and aggregate level of non storage supplies. The aggregate supply position is expected to be similar to that experienced last winter. However there is movement in the forecasts for the individual supply components. For the UKCS we are forecasting further declines. For Norway and BBL our forecast reflects winter 2009/10 performance. For LNG where further import capacity is available for next winter we are forecasting flows at the upper range

[1] Currently, priority loads represent less than 2% of protected by monitor demands.

of winter 2009/10 performance. For IUK our forecasts[2] are as in previous winters dependent on demand (price) and the availability of other NSS components.

Table 2 shows the NSS assumptions used in calculating the safety monitors. The safety monitor requirement is highly dependent on the NSS level.

Table 2 – Non Storage Supply Assumptions

	CV[3] (MJ/m3)	**2010/11 Safety Monitor: non-storage supply assumptions**	
		mcm/d	**GWh/d**
UKCS	39.30	168	1834
Norway	40.00	90	1000
BBL	39.00	30	325
LNG	39.63	60	661
IUK	38.82	20	216
Total		368	4036
95% NSS		**350**	**3834**

The focus of the safety monitors is public safety and hence it is prudent to ensure that the assumed level of NSS will be available throughout the winter, notably at times of high demand. Figure 1 highlights the range of data points around the best fit trend lines. To capture most data points the trend line needs to be reduced. On analysis of previous winters lowering the trend line to 95% captures typically 95% of all data points, with those that are still below often reflected by short term supply losses as experienced on occasion last winter.

By applying a value of 95% to the aggregated total of NSS, the value of NSS used in determining the 2010/11 safety monitors is reduced from 368 to 350 mcm/d. The resulting relationship of NSS against demand is shown in Figure 2.

[2] IUK assumed to import at increasing levels as UK demand exceeds roughly 400 mcm/d
[3] An estimated CV has been applied to assist conversion of data published in both volumetric and energy terms

Figure 2 – Maximum non-storage supply assumptions and NSS v demand relationship

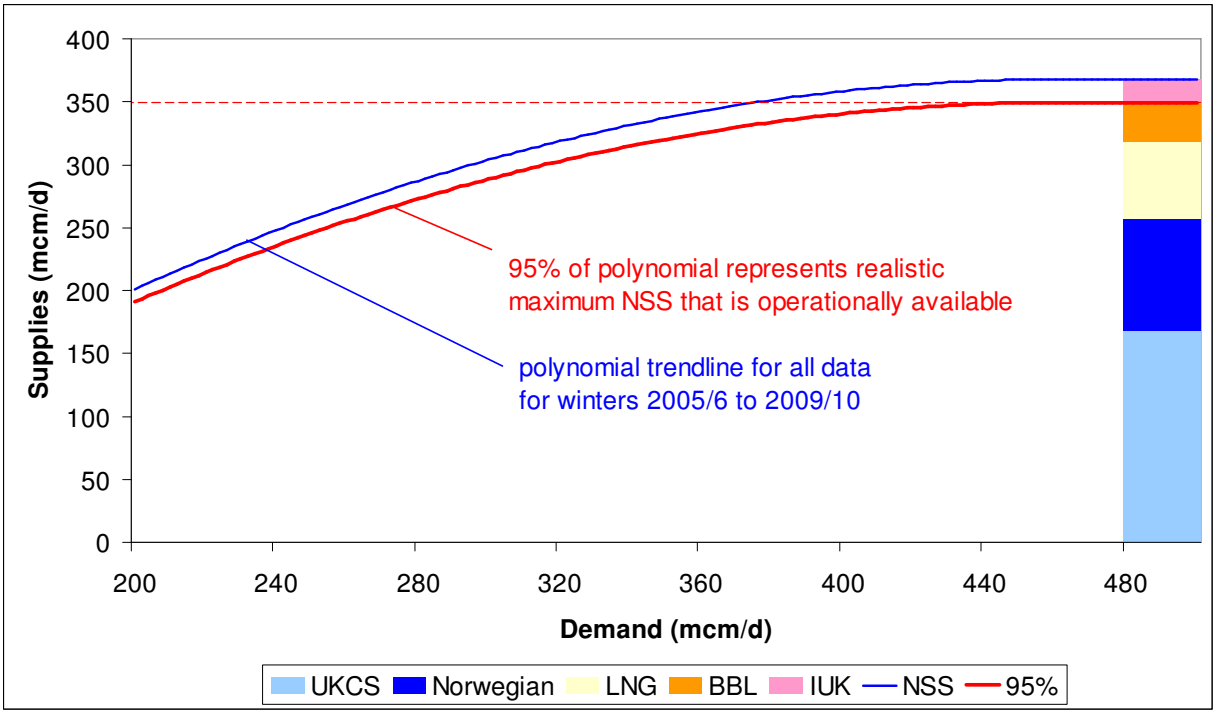

Table 3 shows the anticipated availability of storage capacity in winter 2010/11

Table 3 - Storage

	Space (GWh)	Deliverability (GWh/d)	Space (mcm)	Deliverability (mcm/d)
Short (LNG)[4]	1240	390	113	35
Medium (MRS)[5]	10786	609	981	55
Long (Rough)[6]	38750	455	3523	41
Total	**50776**[7]	**1454**	**4617**	**131**

Demand

The demand background used for the analysis in this section is our demand forecasts for 2010/11 that we produced in May 2010. These are slightly higher than our 2009/10 forecasts produced in May 2009. With the overall supply position expected to be similar to that experienced last winter, the slightly higher levels of forecast demand have marginally increased the safety monitor levels for next winter.

[4] Includes Glenmavis, Partington and Avonmouth
[5] Includes Hornsea, Hole House Farm, Hatfield Moor, Humbly Grove and Aldbrough
[6] Reflects latest information from Centrica Storage Limited
[7] Represents total storage space. Operating Margins space bookings, Scottish Independent Undertakings and Constrained LNG requirements for 2010/11 are not excluded

Safety Monitor Space Requirement

Table 4 shows the total safety monitor space requirement on the basis of the supply and demand assumptions outlined above.

Table 4 – Total Safety Monitor Space Requirement

	Total storage capacity (GWh)	Space requirement (GWh)	Space requirement %
Total	**50776**	**1163**	**2.3%**

Storage Safety Deliverability Requirement

Table 5 shows the supply surplus on day 1 of the 1 in 50 winter. It should be noted that there is considerable additional deliverability over and above that required to meet NDM and priority demand on the day.

Table 5 – Peak NDM & Priority Demand and Peak Day Supply

Demand	**GWh/d**
Peak[8] NDM & Priority Demand (A)	4201
Peak Supplies	**non-storage supply assumptions**
UKCS	1742[9]
Imports	2092[10]
Storage	1454
Total Supplies (B)	5288
Supply Surplus (B) – (A)	**1087**

Indicative 50 mcm/d supply shock Safety Monitor Space Requirement

Table 6 shows the total safety monitor space requirement on the basis of a sustained 50 mcm/d supply loss, reducing aggregate NSS from 350 to 300 mcm/d

[8] Note that in this instance peak refers to Day 1 of the Severe (1 in 50) diversified load duration curve, as this represents the highest level of NDM and priority demand that would be supported during a severe (1 in 50) winter

[9] 95% of value from Table 2 to reflect maximum operationally available

[10] 95% of value from Table 2 to reflect maximum operationally available

Table 6 – Indicative Total Safety Monitor Space Requirement for 50 mcm/d supply shock – FOR INFORMATION ONLY

FOR INFORMATION ONLY	Total storage capacity (GWh)	Space requirement (GWh)	Space requirement %
Total	**50776**	**9815**	**19.3%**

Firm Monitor Calculation Process

As stated previously, firm gas monitors are published solely for the purpose of providing further information to the market.

The concept behind the firm monitors is to illustrate the indicative level of gas that would need to be held in storage to support all firm demand in a 1 in 50 winter. The analysis uses the same demand and supply assumptions as used for the calculation of the safety monitors. This includes the new profile for NSS at 95%.

Firm Monitor Space Requirement

Table 7 shows the indicative total level of storage required to support all firm demand in a 1 in 50 winter. It can be seen that nearly a third of storage is required. This is not surprising, as the 1 in 50 winter represents a sustained, very cold winter. Under such a scenario, with the UK experiencing several months of sustained very cold weather, it seems plausible that the tight supply-demand position will result in higher prices that in turn may attract additional imports, thereby reducing the firm monitor space requirement.

Table 7 – Storage space Analysis

	Total storage capacity	Space requirement (GWh)	Space requirement %
Total	**50776**	**16497**	**32.5%**

Storage Firm Gas Deliverability Requirement

Table 8 shows that there is sufficient deliverability to meet the 1 in 20 peak day firm demand. This shows that there should be no issues regarding supporting all firm demand for short, but very cold snaps.

Table 8 – Peak Firm Demand[11] and Peak Day Supply

Firm Demand	**GWh/d**
Diversified 1 in 20 Cold Peak Day (C)	4782
Peak Supplies	**non-storage supply assumptions**
UKCS	1742
Imports	2092
Storage	1454
Total Supplies (D)	5288
Supply Surplus (D) – (C)	**506**

[11] Diversified firm demand for a 1 in 20 cold peak day