

Safety Monitor and Firm Gas Monitor Requirements

September 2011

Introduction

This document sets out 'Safety Monitors' and 'Firm Gas Monitors' for the 2011/12 winter, pursuant to National Grid's obligations under the Uniform Network Code (UNC), Section Q.

Safety Monitors were introduced in 2004 to replace the so-called 'Top-up' monitors, which had existed (through the Network Code) since 1996. Safety Monitors define levels of storage that must be maintained through the winter period. 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).

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

Safety Monitor Methodology

It is our 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. It is therefore appropriate that we adopt a prudent approach to setting the Safety Monitor levels.

The concept behind the Safety Monitors is to provide sufficient gas 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 storage deliverability Safety Monitor indicates the minimum level of deliverability required to both safely isolate loads that are "protected by isolation" and also support loads that are "protected by monitor". The deliverability Safety Monitor is therefore providing operational cover should an emergency be called on any particular day, whilst the space Safety Monitor provides sufficient gas in store to support "protected by monitor" loads for the remainder of the winter.

The level of the Safety Monitor is dependant on the level of non storage supplies (NSS) and therefore if the level of NSS reduces, the safety monitor will increase. This assessment is undertaken on a regular basis by National Grid throughout the winter period.

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Operation of Safety Monitors

It is a requirement of National Grid's Safety Case that we operate this monitor system and that we take action to ensure that storage stocks (space) do not fall below the defined level. The level of storage established by the Safety Monitor is that required to underpin the safe operation of the gas transportation system. Its aim is to ensure the preservation of supplies to domestic customers, other non-daily metered (NDM) customers and certain other customers who could not safely be isolated from the gas system if necessary in order to achieve a supply-demand balance and thereby maintain sufficient pressures in the network.

The space Safety Monitor defines the minimum level of stored gas required in aggregate in all UK storage, on each day of the winter. We monitor the level of gas in all storage facility types throughout the winter to ensure that the actual aggregate stock level does not fall below the space Safety Monitor level. If this were to occur, there would be insufficient gas left in storage to underpin the safe operation of the system in a 1 in 50 cold winter or for 1 in 50 conditions for the remainder of the winter. Under these conditions, we would therefore be obliged by our Safety Case to take action to remedy this situation. In the lead-up to such a situation, we would advise the market with the objective of encouraging mitigating action. If necessary, however, the Network Emergency Co-ordinator (NEC) may require the relevant storage operators to reduce or curtail flows of gas out of storage. In this situation, we would expect the market to rebalance in order to achieve a match between supply and demand.

We would continue to provide information to the market as the situation developed. For this winter we will continue to provide through our website a five day ahead view of the supply/demand balance, historic and forward projections of storage use and how these levels relate to the Safety Monitor requirements and the setting of the Gas Balancing Alert (GBA) trigger.

The combination of increased information and clarity of the remaining storage position should assist market participants in ensuring security of supply. While National Grid would seek to minimise the extent of any intervention in the market, the balance between allowing the market to resolve the situation and taking action via the NEC will clearly depend on the severity of the situation and the associated timescales.

Approach to the Safety Monitor Levels

This note is published in conjunction with the Winter 2011/12 Outlook Report, which contains more detailed coverage of our preliminary view of supplies for the coming winter.

For winter 2011/12 there continues to be significant levels of uncertainty with respect to NSS levels, in particular with import supplies. Consequently we have identified a range for each supply component.

It should be noted that we will continue to review the Safety Monitor and Firm Gas Monitor levels throughout the winter and, if necessary, we will revise them to reflect material changes to the supply-demand balance.

National Grid will continue to provide winter feedback to industry regarding supply assumptions and resulting changes to Safety Monitors by means of monthly updates via Operational forums and our reporting on our website.

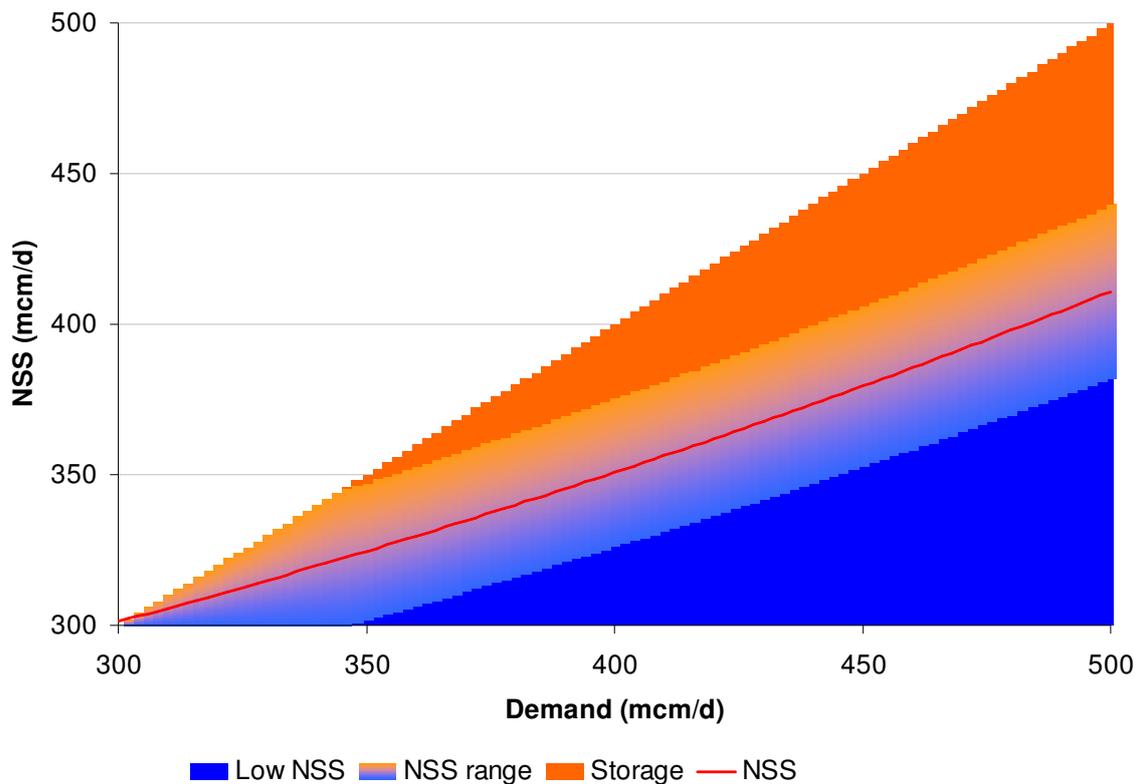
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Supply Assumptions

Figure 1 shows a simplified representation of how supply is forecast to meet demand for winter 2011/12. The data set to create this chart is from the past 5 winters with a weighting towards the most recent winters. The supply is broken down into three discreet areas, one of non storage supply (NSS), one of storage and an area in between where storage and NSS are both expected to contribute to some extent.

Figure 1 – Winter 2011/12 Simplified Representation of Supply



Also shown in the chart is a line that represents the best view of NSS. Historically this line used to tend towards an asymptote (level off). However last winter's experience of LNG and IUK imports suggested that these and other imports competed with storage at high demands. For last winter the level of NSS reached record levels in excess of 400 mcm/d as the headroom of import capacity was utilised to a greater extent than in previous winters.

As the purpose of the Safety Monitors is to ensure that an adequate pressure can be maintained in the network at all times and thereby protect public safety, a prudent approach is required for NSS assumptions used in Safety Monitor calculations. Hence the top of the "low NSS" area is used.

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.

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Table 1 shows the anticipated availability of storage in winter 2011/12.

Table 1 – Storage Space and Deliverability Assumptions

Storage type	Space¹ (GWh)	Deliverability² (GWh/d)
Short (LNG) ³	677	143
Medium (MRS) ⁴	8767	457
Long (Rough)	39500 ⁵	476
Total	48944	1076

Demand Assumptions

The basis for the calculation of the Safety Monitor levels is our 2011 demand forecasts for 2011/12, using a severe (1 in 50 cold) load duration curve. Our base case for demands assumes relatively low power generation. These could be potentially significantly higher if there is a shift in the relative economics of gas and coal fired generation, resulting in decreased use of coal and increased use of gas for power generation.

Safety Monitor Levels

Table 3 shows the initial Safety Monitor requirements for space and deliverability.

Table 2 – Stored Safety Gas and Storage Safety Deliverability Requirement

Assumed total storage space (GWh)	<u>Space</u> Safety Monitor (GWh)	<u>Space</u> requirement (%)	<u>Deliverability</u> Safety Monitor (GWh/d)
48944	731	1.5%	518

¹ Includes Operating Margins space booking for 2011/12 of 763 GWh

² Deliverability values are now based on a site by site review of the operational performance of all storage facilities. It is based on proven performance. This will enable improved security analyses to be undertaken.

³ Commercial services offered by LNGS for 2011/12

⁴ Includes Hornsea, Holehouse Farm, Hatfield Moor, Humbley Grove and Aldbrough. Excludes Holford.

⁵ Reflects latest information from Centrica Storage Limited on anticipated space for winter 2011/12

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Stored Firm Gas Requirement

The Firm Gas Monitor represents the storage levels required to support all firm demand in a severe (1 in 50 cold) winter. Note that it is published for information only.

DN Exit Reform

UNC Modification Proposal 0090: Revised DN Interruption Arrangements (Mod 0090) was directed for implementation on 1st April 2008. From October 2011 the majority of DN sites will be considered firm for transportation purposes. This has an impact on the 2011/12 Safety and Firm Monitors in that additional DN demand is now no longer contracted for interruption by the Transporter and therefore under the methodology for calculating the monitor levels there is an increase in the level of load defined as “firm”. This has not made any material change on the overall level of demand.

NTS Exit Reform

Modification Proposal 0195AV: Enduring NTS Exit Capacity Arrangements (Mod 0195) was directed for implementation on April 2009. From October 2012 this will also have an impact on the 2012/13 Safety and Firm Monitors in that additional NTS demand will also be considered as “firm”.

2011/12 Firm Monitor Assessment

For the purposes of calculating the 2011/12 Firm Monitor, we have considered all demand as firm. We believe this is appropriate as the NTS demand forecast, in particular the NTS power station forecast is relatively low, with little potential for demand reduction. Hence though NTS Exit Reform implementation is not due until October 2012 the forecast of relatively low gas demand for power generation makes any split of firm and interruptible demand inappropriate.

Note that the NSS assumption used for calculating the 2011/12 Firm Monitor is different to that used for the Safety Monitor. The Firm Monitor is calculated using our central value for NSS, as shown by the red line in Figure 1.

Table 3 – Firm Monitor Space Analysis

Assumed total storage space (GWh)	Firm Space (GWh)	Firm Space (%)
48944	46065	94.1%

The Firm Monitor space requirement is high. This is to be expected, as the Firm Monitor represents the volume of storage required to support all demand throughout a 1 in 50 severe winter, assuming that NSS performs in line with our best view. In reality, such a sustained period of cold weather would probably result in higher gas prices, leading to increased NSS levels and/or a demand side response (DSR), albeit any DSR may be limited due to the assumption of low forecast demand for power generation.

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Storage Firm Deliverability Requirement

Table 4 – Peak Firm Demand⁶ and Peak Day Supply

Firm Demand	GWh/d
Diversified 1 in 20 Cold Peak Day (A)	5229
Peak Supplies	
Non-storage supplies	4345
Storage	1076
Total Supplies (B)	5421
Supply Surplus (B) – (A)	192

⁶ Diversified firm demand for a 1 in 20 cold peak day

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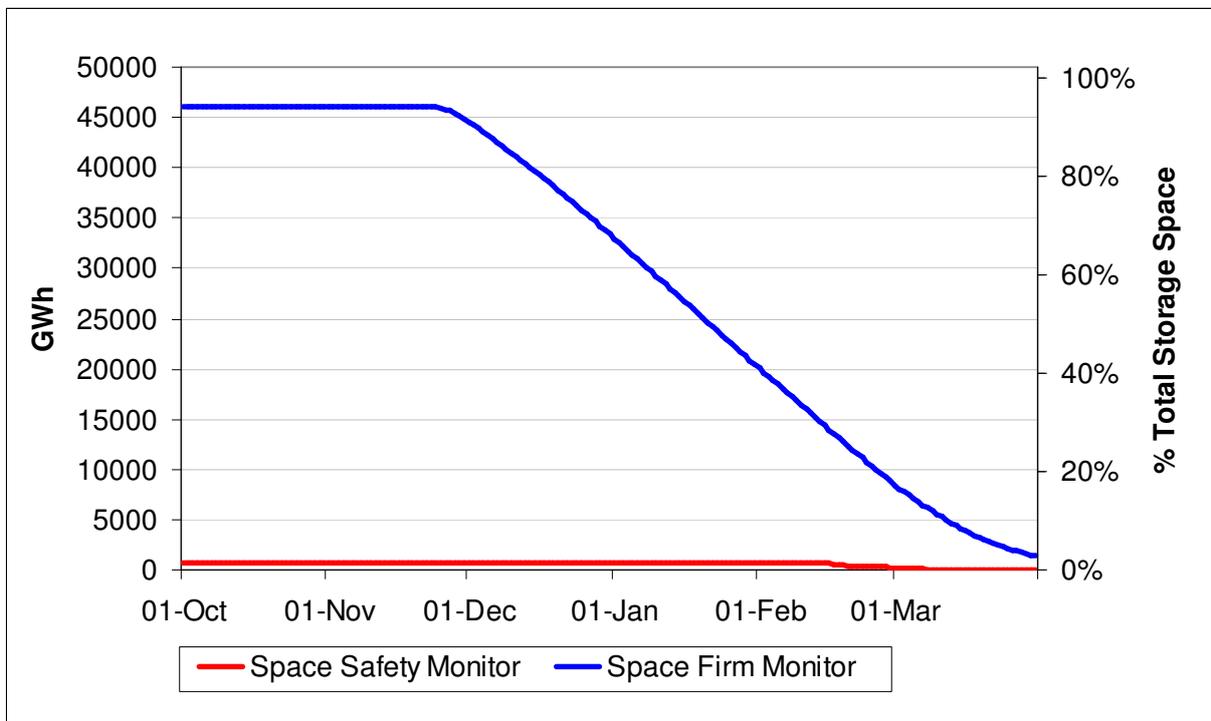
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Monitor Profiles

Figure 2 shows the space profiles for the Safety Monitor and Firm Gas Monitor whilst Figure 4 shows the deliverability profile for the Safety Monitor.

The objective of the Safety Monitor profile is to identify at any point in time the requirement for gas in store to underpin the safe operation of the gas transportation system for what remains of the winter period. Both the Safety and Firm Monitors allow for the possibility of late winter cold weather patterns based on analysis of historical temperatures. However, in the event of cold weather earlier in the winter, the profiles may be reduced to reflect the occurrence of cold weather. This methodology is explained in more detail in our Safety & Firm Gas Monitor Methodology document⁷.

Figure 2: Space Safety Monitor and Space Firm Monitor Profiles

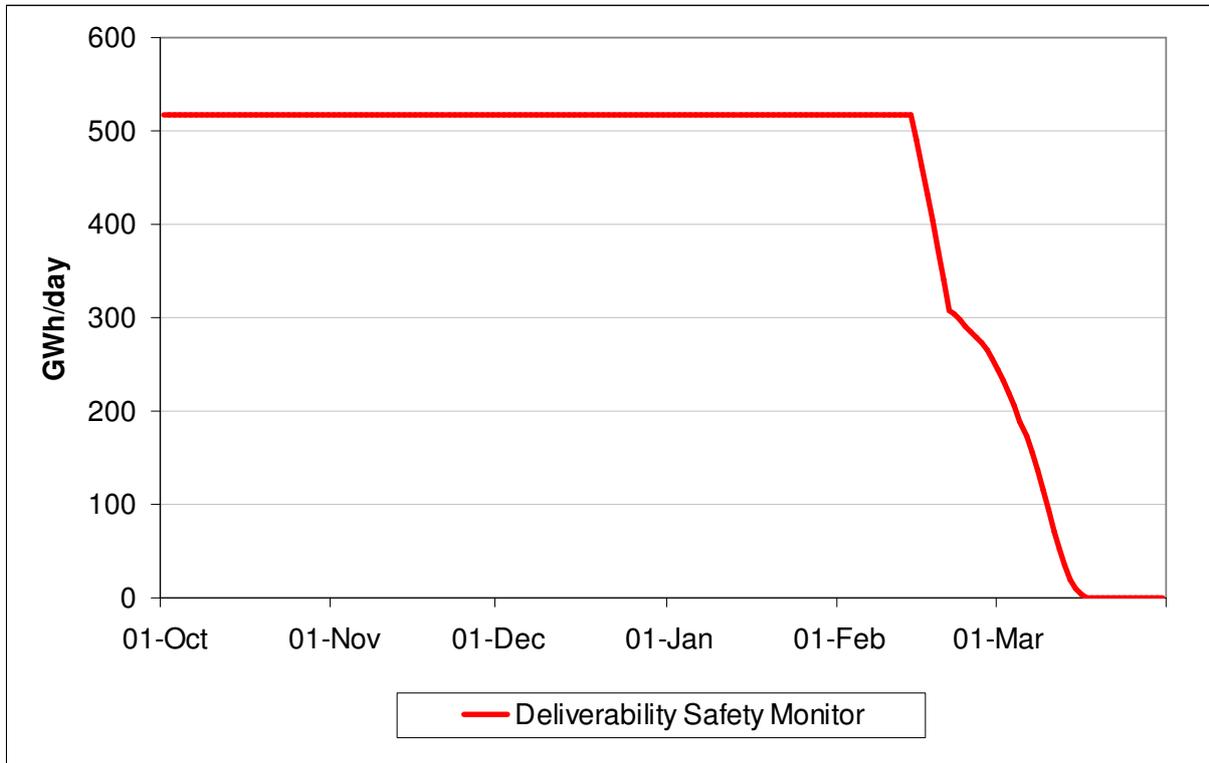


⁷ <http://www.nationalgrid.com/NR/rdonlyres/B4ACC5F8-A8AF-48B4-A8AA-04BE3743E1C9/13676/20067SafetyFirmGasMonitorMethodology.pdf>

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Figure 3: Deliverability Safety Monitor profile



Notes on Demand Assumptions

National Grid forecasts both diversified demand and undiversified demand. The diversified peak day is the peak day for the whole country, whilst the undiversified peak day is the peak day for each area of the country added together.

For planning and investing in the network, National Grid uses 1 in 20 peak day undiversified demand conditions (in addition to analysing other less severe weather conditions). This allows for the fact that there is no single profile of demand across the country associated with a 1 in 20 cold peak day, and therefore ensures sufficient transportation capacity is available to meet 1 in 20 demand under a range of conditions.

For security planning including Safety Monitors, National Grid uses diversified demand forecasts, which is the appropriate basis for assessing the balance between supply and demand on a national basis.