

Safety Monitor and Firm Gas Monitor Requirements

29 September 2006

Introduction

This document sets out 'Safety Monitors' and 'Firm Gas Monitors' for the 2006/07 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. The 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.

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 do not fall below the defined levels. The levels of storage established by the safety monitors are those required to underpin the safe operation of the gas transportation system. They 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 monitors define minimum levels of stored gas required in each type of storage facility, on each day of the winter. We monitor the level of gas in each of the three storage facility types throughout the winter to ensure that the actual stock level does not fall below the relevant 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, and 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. 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 Monitor Levels

On 4 September we published a document entitled "Safety Monitor Requirements 2006/07" outlining the approach we were minded to take to the calculation of the initial

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Storage Safety Monitor Requirements for the coming winter¹. In particular, the document noted that:

- Responses to our July winter consultation update document² broadly endorsed the supply base case on which we consulted. It was recognised, however, that while the base case represents a reasonable 'best view', a significant level of uncertainty remains associated with both the construction and commissioning of new importation infrastructure, and the availability of supplies to utilise this infrastructure;
- Responses to our July document indicated that our revised forecasts are sound, but recognised that there is a material risk that NDM demand may be higher than forecast under very cold conditions (for which we have no recent evidence of consumer behaviour);
- 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 therefore required. We therefore concluded that when the supply-demand background is particularly uncertain, it is appropriate to use a more cautious set of assumptions than the 'best view' in the safety monitor assessment. For this reason, we intended to build a risk element into the initial safety monitor levels.

Since publishing the 4 September document, we have received no relevant new information regarding the supply-demand background. We have therefore calculated the safety monitors based on the approach and assumptions outlined within the 4 September document. The following sections explain the approach that we have taken to the safety monitor calculation in relation to supply and demand respectively.

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.

Supply Assumptions

Given the significant level of uncertainty associated with the supply background, relating both to the construction and utilisation rates of new importation infrastructure, we have assumed a level of supply 15 mcm/d below the base case across the winter. It is possible to identify a number of different and plausible scenarios in which supply levels could be depressed to this extent.

Table 1 shows the base case supply assumptions from our Winter 2006/07 Consultation Report³, and the additional 15 mcm/d supply risk allowance.

¹ <http://www.nationalgrid.com/NR/rdonlyres/9A832AE5-10E9-48D0-BBD9-1E58215A6A32/10206/SafetyMonitors040906.pdf>

² http://www.ofgem.gov.uk/temp/ofgem/cache/cmsattach/15693_MainbodyJulyfinaldoc070706.pdf

³ http://www.ofgem.gov.uk/temp/ofgem/cache/cmsattach/16803_168_06.pdf

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Table 1 – Supply Assumptions by Supply Source

Supply source	Assumed flow (mcm/d)	CV⁴ (MJ/m³)	Assumed flow (GWh/d)
UKCS ⁵	240	39.30	2620
Norway	48	40.00	533
IUK	35	38.82	377
BBL	14	39.00	152
LNG imports	13	39.63	143
Supply risk allowance	-15	39.00	-162
Total	335		3663

Table 2 shows the anticipated availability of storage capacity in winter 2006/07.

Table 2 – Storage Capacity Assumptions⁶

Storage type	Space (GWh)	Deliverability (GWh/d)
Short (LNG)	1758 ⁷	526
Medium (MRS)	8111	260 ⁸
Long (Rough)	33805 ⁹	455
Total	43674	1241

Demand Assumptions

The basis for the calculation of the safety monitor levels is our 2006 demand forecasts for 2006/07, plus an additional 2% of domestic demand for the top 60 days of the 1 in 50 cold load duration curve (which represents an average incremental demand of less than 5 mcm/d). This approach provides partial mitigation against the risk that the new NDM forecasts understate domestic demand at very cold conditions, a risk acknowledged by many respondents to the July consultation.

⁴ An estimated CV has been applied to assist conversion of data published in both volumetric and energy terms

⁵ Assumes average availability of 90% max UKCS

⁶ Excludes Operating Margins gas

⁷ Lower than Winter Consultation due to 139 GWh Scottish Independent Undertakings

⁸ Lower than Winter Consultation due to omission of Hole House Farm deliverability

⁹ Reflects latest information from Centrica Storage Limited on anticipated space for winter 2006/07

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Initial Safety Monitor Levels

Table 3 shows the initial safety monitor requirements.

Table 3 – Stored Safety Gas Requirement

Storage type	Assumed storage capacity (GWh)¹⁰	Space requirement (GWh)	Space requirement (%)
Long duration storage (Rough)	33805	5682	16.8%
Medium duration storage (MRS)	8111	969	11.9%
Short duration storage (LNG)	1758	383	21.8%
Total	43674	7034	16.1%

Storage Safety Deliverability Requirement

Table 4 – Peak NDM & Priority Demand and Peak Day Supply

Demand	GWh/d
Peak ¹¹ NDM & Priority Demand (A)	4299 ¹²
Peak Supplies	
Non-storage supplies	3663 ¹³
Storage	1241
Total Supplies (B)	4904
Supply Surplus (B) – (A)	605

Stored Firm Gas Requirement

The firm gas monitors represent the storage levels required to support firm demand in a severe (1 in 50 cold) winter. They are published for information only. Note that they are calculated using the gas supply base case and our latest demand forecast; neither the supply risk allowance nor the 2% increase in domestic demand for the top 60 days are included.

¹⁰ Excludes Operating Margins Gas and Scottish Independent Undertakings

¹¹ Day 1 of the Severe (1 in 50 cold) diversified load duration curve

¹² Includes additional 2% of domestic demand

¹³ Net of 15 mcm/d supply risk allowance

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Table 5 – Space Analysis (GWh)

Storage type	Assumed storage space (GWh)	Firm Stored Gas Requirement (GWh)	Firm Stored Gas Requirement
Long duration storage (Rough)	33805	15432	45.7%
Medium duration storage (MRS)	8111	3420	42.2%
Short duration storage (LNG)	1758	1582	90.0%
Total	43674	20434	46.8%

Storage Firm Deliverability Requirement

Table 6 – Peak Firm Demand¹⁴ and Peak Day Supply

Firm Demand	GWh/d
Diversified 1 in 20 Cold Peak Day (C)	4893
Peak Supplies	
Non-storage supplies	3825
Storage	1241
Total Supplies (D)	5066
Supply Surplus (D) – (C)	173

¹⁴ Diversified firm demand for a 1 in 20 cold peak day

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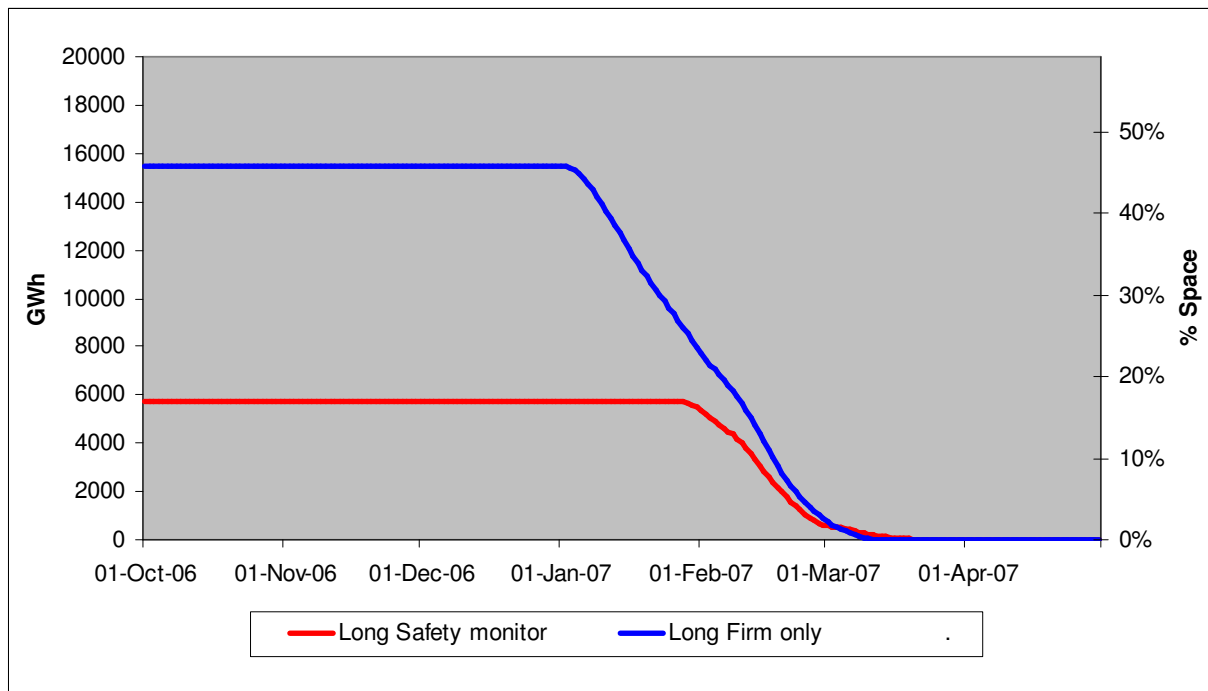
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Monitor Profiles

Figures 1 to 3 show the safety monitor profiles and the firm gas monitor profiles for long, medium and short duration storage respectively.

The objective of the safety monitor profiles is to ensure that at any point in time sufficient gas will remain in store to underpin the safe operation of the gas transportation system for what remains of the winter period. They 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 monitor levels may be reduced at that time. This methodology is explained in more detail in our Safety & Firm Gas Monitor Methodology document¹⁵. This document will be updated in October, to reflect the 2006/07 calculations.

Figure 1: Long duration storage Safety Monitor and Firm Gas Monitor Profiles



¹⁵ <http://www.nationalgrid.com/NR/rdonlyres/B4ACC5F8-A8AF-48B4-A8AA-04BE3743E1C9/4524/20056SafetyFirmGasMonitorMethodology.pdf>

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Figure 2: Medium duration storage Safety Monitor and Firm Gas Monitor Profiles

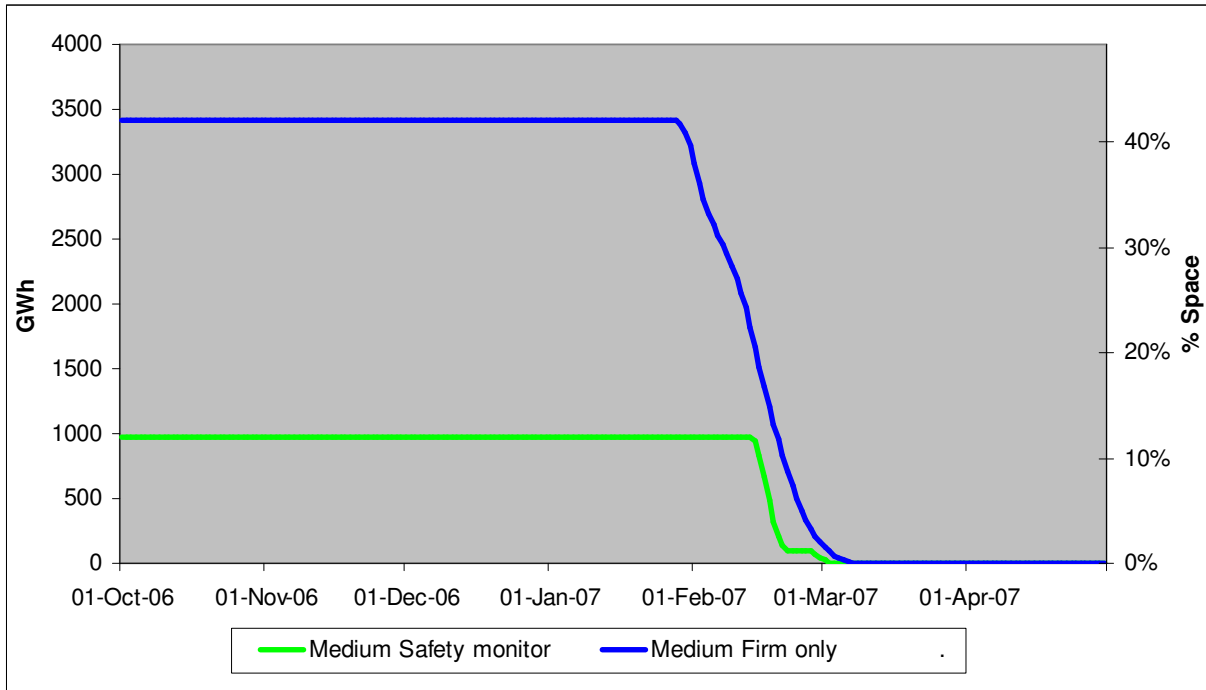
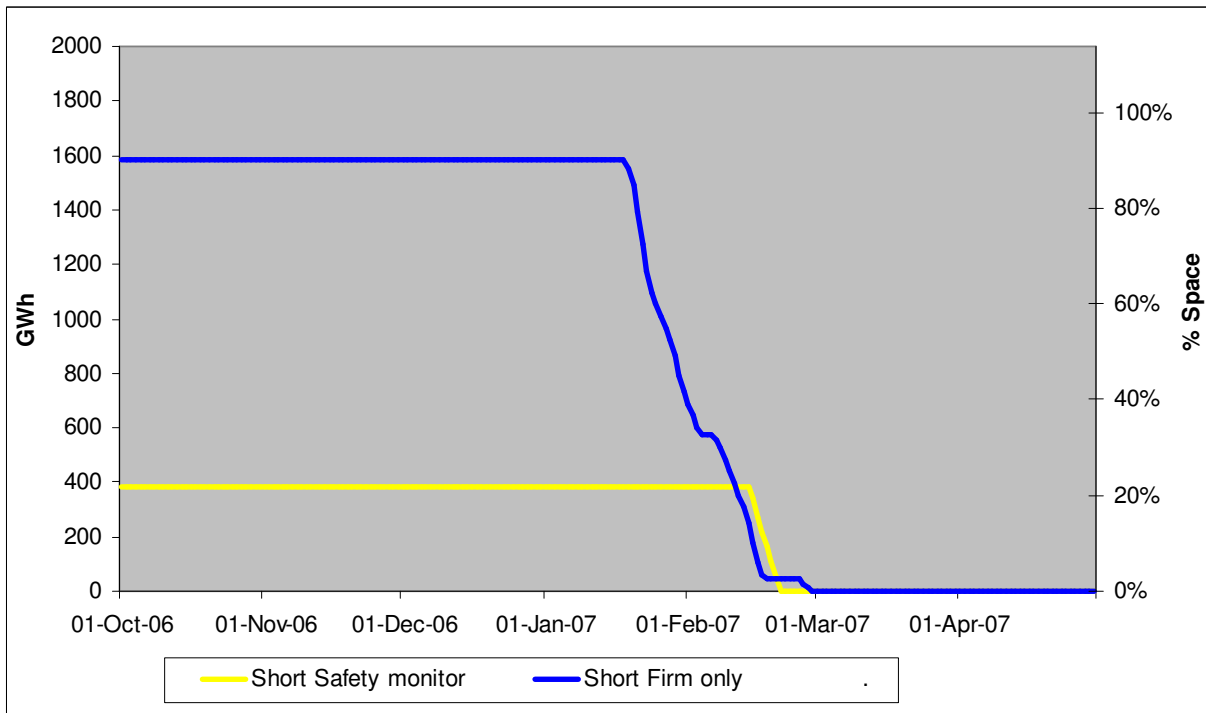


Figure 3: Short duration storage Safety Monitor and Firm Gas Monitor Profiles



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Storage Facility Designation

1. Short duration storage facilities now exclude Grain which is included under imports.
2. Medium duration storage facilities now include Hornsea, Hole House Farm, Hatfield Moor and Humbly Grove for space; and Hornsea, Hatfield Moor and Humbly Grove for deliverability.

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 cold 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 cold demand under a range of conditions.

For 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.