

T/PM/E/1

**PROCEDURE FOR
NETWORK GAS SUPPLY EMERGENCY**

Version 8.0 July 2012

FOREWORD

The Network Emergency Co-ordinator (NEC) approved this procedure in July 2012 for use by all those with a duty of co-operation as provided in the Gas Safety (Management) Regulations 1996.

These documents are revised, when necessary, by the issue of new editions. Users must ensure that they are in possession of the latest edition by referring to the Register of Safety and Engineering Documents available on National Grid Infonet system or to the Emergency Planning Team.

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In this document:

must: indicates a mandatory requirement.

should: indicates best practice and is the preferred option. If an alternative method is used then a suitable and sufficient risk assessment must be completed to show that the alternative method delivers the same, or better level of protection.

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EXECUTIVE SUMMARY

T/PM/E/1 is the management procedure used for managing a Network Gas Supply Emergency and provides further detail and interpretation of the Network Emergency Co-ordinator's Safety Case.

A Network Gas Supply Emergency is where a situation exists on the primary system (the National Transmission System) which has the potential to cause, or has caused, a supply emergency, defined in the Gas Safety (Management) Regulations 1996 as an emergency endangering persons and arising from a loss of pressure in a network or any part thereof.

A Network Gas Supply Emergency could be caused by:

- a) Insufficient gas supplies available to the primary system (Gas Deficit).
 - Gas Deficit Emergency – Insufficient supplies available to the primary system.
 - Safety Monitor Breach – where there is or may be insufficient gas storage available to meet the winter demand conditions.

- b) A critical transportation constraint in the primary system.
 - This may occur when there is sufficient gas available but due to a constraint on the primary system the gas can not be transported to the correct location.

To provide a measured, appropriate and co-ordinated response to a Network Gas Supply Emergency the NEC has defined four stages of an emergency. The NEC may request emergency actions are completed out of sequence if deemed appropriate in the interest of health and safety. Below are the four stages of a Network Gas Supply Emergency and the actions available at each stage.

Network Gas Supply Emergency Classification			
	Gas Deficit: Insufficient Gas Supplies Available to the NTS		Critical Transportation Constraint in the NTS
Emergency Stage	Gas Deficit Emergency	Safety Monitor Breach	Critical Transportation Constraint
1 (Potential)	<ul style="list-style-type: none"> • Gas conforming to Schedule 3 Part II of GS(M)R • NTS Linepack • Distribution Network Utilisation <ul style="list-style-type: none"> ○ Distribution Network Storage ○ Emergency Interruption* • Public Appeals 	<ul style="list-style-type: none"> • Instruct shippers & storage operators to amend storage flows • Distribution Network Utilisation <ul style="list-style-type: none"> ○ Emergency Interruption* • Public Appeals 	<ul style="list-style-type: none"> • Gas conforming to Schedule 3 Part II of GS(M)R • NTS Linepack • Distribution Network Utilisation <ul style="list-style-type: none"> ○ Distribution Network Storage ○ Emergency Interruption* • Public Appeals
2	<ul style="list-style-type: none"> • National Grid Gas plc's participation in the OCM will be suspended • Maximise Supplies • Firm Load Shedding • Public Appeals 	<ul style="list-style-type: none"> • National Grid Gas plc's participation in the OCM will be suspended • Maximise Supplies • Firm Load Shedding • Public Appeals 	<ul style="list-style-type: none"> • National Grid Gas plc will continue to participate in OCM • Maximise Storage • Firm Load Shedding • Public Appeals
3	<ul style="list-style-type: none"> • Public Appeals • Allocation & Isolation 	<ul style="list-style-type: none"> • Public Appeals • Allocation & Isolation 	<ul style="list-style-type: none"> • Public Appeals • Allocation & Isolation
4	<ul style="list-style-type: none"> • Restoration 		

**Emergency Interruption will remain as an action that applies to Distribution Networks' contracted interruptible sites only.*

T/PM/E/1 provides further information on these emergency stages as well as detail on the prioritisation of consumers, communication routes in an emergency and the formation of the emergency strategy. The procedure also provides a summary of the roles and responsibilities of the NEC and the primary transporter.

1. INTRODUCTION

T/PM/E/1 is the industry procedure used for managing a Network Gas Supply Emergency (NGSE) occurring on the primary system. Detailed arrangements are not included in the procedure, as these should be incorporated into the emergency plans of the affected parties.

Throughout the procedure the terms referenced in the Network Emergency Co-ordinator (NEC) Safety Case will be used.

This will include describing the Network as defined in the NEC Safety Case.

Figure 1 Definitions

Term Used	Alternative
Primary System	National Transmission System (NTS)
Primary Transporter	Gas National Control Centre (GNCC) National Grid (NG)
Secondary System	Distribution Network (DN) Interconnectors Directly connected loads
Secondary Transporter	Distribution Network Control Centres (DNCC)
Supplementary Systems	Systems supplied from secondary systems

The arrangements described in this document take effect from 1st October 2012.

This document supersedes Issue 7.3 of T/PM/E/1 which was issued in January 2007.

T/PM/E/1 is produced and maintained by Emergency Planning Team, Gas Operations, National Grid.

1.1 Scope

T/PM/E/1 is designed to provide a consistent approach for managing gas supply emergencies on the primary system (National Transmission System (NTS)). T/PM/E/1 should not be used for managing local gas supply emergencies (LGSE) on a secondary system (Distribution Network (DN)). T/PM/E/2 should be used for managing a LGSE.

T/PM/E/1 is aligned with the current NEC Safety Case; Final 7.1 Version 1.0, May 2012.

T/PM/E/1 does not outline how the primary transporter manages the primary system on a day-to-day basis. T/PM/E/1 is the procedure that should be used when all normal operational tools available to the primary transporter have failed to address the developing situation.

T/PM/E/1 expands on the 4 stages of a NGSE identified in the NEC Safety Case.

1.2 Purpose

The purpose of T/PM/E/1 (the procedure) is to provide a measured, appropriate and co-ordinated response to a Network Gas Supply Emergency and to meet all the requirements of Section 4 of the NEC Safety Case Final 7.1 Version 1. As a supply emergency cannot occur if the Network is fully pressurised, the procedure is designed to keep the Network fully pressurised for as long as possible by maximising gas supplies that are available to the primary transporter using normal commercial arrangements and by the use of emergency measures, including firm load shedding, to match supply and demand in the Network.

A reduction in system pressure in some parts of the Network may occur when systems, or parts of systems, are isolated during an emergency. This should require the primary and secondary transporters to take action to prevent one or more supply emergencies occurring in these systems.

Figure 8 (page 25) tabulates the 4 stages of the procedure and the interface with normal operations. The procedure has 4 clearly identified stages, which correspond with the 4 stages of the NEC's Safety Case.

For Stages 2 to 4, the NEC should declare the NGSE as a Gas Deficit Emergency, a Safety Monitor Breach or a Critical Transportation Constraint Emergency.

1.3 The Network Emergency Management Team and the Joint Response Team

In the event of a NGSE a Network Emergency Management Team (NEMT) will be set up, led by an Incident Controller, who will manage the incident, develop the emergency strategy and liaise with the Network Emergency Co-ordinator.

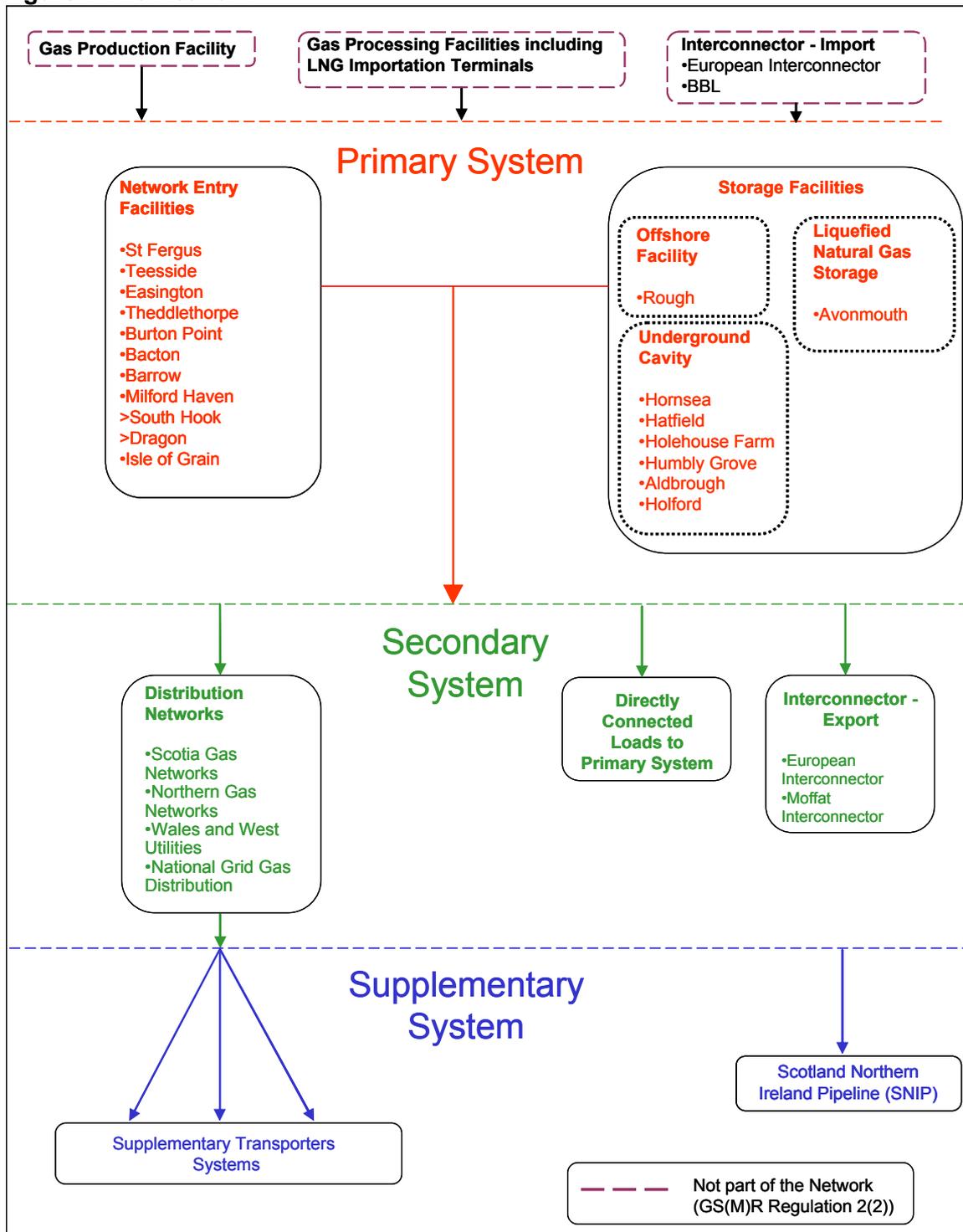
In a potential or actual NGSE, the Department for Energy and Climate Change (DECC) would form the Joint Response Team (JRT). The JRT would receive information from DECC, National Grid Electricity and Gas Transmission, Gas Distribution Networks and other relevant gas and electricity industry representatives on the effects of the NGSE. Based on this information DECC may issue Notices of Direction that must be taken into account by the NEMT when determining the emergency strategy.

2. THE NETWORK

The NEC Safety Case identifies that the Network consists of three types of system, specifically primary, secondary and supplementary.

This classification enables the NEC to clearly differentiate between the roles of the various conveyors operating on the Network and those involved in identifying a potential or actual supply emergency. The Network is summarised below in Figure 2.

Figure 2 The Network



2.1 Primary System

The primary system (NTS) transports gas from the gas processing facilities, storage facilities and interconnectors to all secondary systems. In the majority of cases the primary system is the sole source of gas for secondary systems but there are some secondary systems that receive gas from sources other than the primary system. The primary transporter operates the primary system.

The operation of the primary system is controlled from the primary transporter's Gas National Control Centre (GNCC) located at National Grid House, Warwick. The GNCC is responsible for the continuous monitoring and control of the physical network ensuring its safe operation at all times. In addition it undertakes the application of commercial activities associated with the Uniform Network Code.

2.2 Secondary Systems

A system taking gas from the primary system via offtakes is classified as a secondary system. Secondary systems include large loads and Distribution Networks (DNs) supplying domestic and non-domestic end users.

Secondary system conveyors have arrangements in place for monitoring the operation of their systems.

2.3 Supplementary Systems

Supplementary systems take gas from secondary systems and supply domestic and/or non-domestic end users.

Supplementary system conveyors have arrangements in place for monitoring the operation of their systems.

3. SUPPLIES TO THE PRIMARY SYSTEM

3.1 Network Entry Facilities

Figure 2 details the network entry facilities that deliver gas to the primary system. This comprises of beach terminals that deliver production from the UK continental shelf and interconnectors and LNG importation terminals. The quality of gas entering the primary system is monitored to ensure compliance with the requirements of the Gas Safety (Management) Regulations 1996 (GS(M)R) Part I Schedule 3.

3.2 LNG Importation Terminals

National Grid Gas considers liquefied natural gas (LNG) importation terminals to be classified as gas processing facilities and as such, considers them to be subject to the duty of co-operation with the NEC.

3.3 Gas Storage Facilities

These facilities are connected to the primary system and can operate in two modes, import or export. The quality of gas entering the primary system is monitored to ensure compliance with the requirements of GS(M)R Part I Schedule 3. The gas storage facilities are detailed in Figure 2. There are three types of gas storage facility connected to the primary system. Gas is held in some or all of these facilities to meet the requirements of Operating Margins and Safety Monitor gas.

- **Liquefied Natural Gas**
There is one LNG storage site connected to the primary system and three LNG importation terminals, (see Figure 2).
- **Underground Cavities**
There are six underground cavity storage sites connected to the primary system, having greater flexibility for injection and withdrawal, (see Figure 2).
- **Offshore Storage Facility**
The Rough storage facility is connected to the primary system via the Easington Terminal.

If a potential or actual supply emergency has been identified the NEC will request via the primary transporter the co-operation of storage operators to prevent a potential or actual supply emergency developing.

3.4 Operating Margins Gas

Operating Margins Gas is required under the primary transporter's safety case to support the primary system as required.

The primary transporter determines the quantity and location of Operating Margins Gas.

3.5 Safety Monitor Gas

Gas is required in storage to protect small embedded industrial and commercial consumers, domestic consumers and supplies to Ireland.

3.6 Interconnectors

There are three interconnector pipelines connected to the primary system.

- **Moffat Interconnector**
Physically flows gas to the Republic of Ireland, the Isle of Man and Northern Ireland and is an export pipeline.
- **European Interconnector**
Physically flows gas to and from Belgium and is a bi-directional import and export pipeline.
- **BBL**
Physically flows gas to the NTS from the Netherlands.

If a potential or actual supply emergency has been identified the NEC will request, via the primary transporter, the co-operation of interconnectors to prevent a potential or actual supply emergency from occurring.

4. DEFINITIONS OF EMERGENCIES

4.1 Supply Emergency

A "supply emergency" is defined by regulation 2(1) of the Gas Safety (Management) Regulations 1996 as "an emergency endangering persons and arising from a loss of pressure in the network or any part thereof ". The primary transporter considers that a supply emergency will exist if the pressure in a pipe (as defined by GS(M)R Regulation 2(1)) has fallen to a level too low for normal operation below 19 mbar of equipment or appliances, and then increases again allowing un-burnt gas to be admitted into the premises where the equipment or appliance is located forming an explosive mixture at concentrations between 5% and 15% gas in air.

This should only occur where appliance pilot light and burners have been extinguished as the gas supply pressure falls and there are no safety features preventing the flow of gas when the pressure is restored. It should be noted that many appliances have safety features that would prevent this from occurring.

In this context a supply emergency should only arise where gas is being taken from the network by a consumer and must therefore be linked to specific premises.

4.2 Gas Supply Emergency

A supply emergency describes a state where a dangerous situation exists. The NEC and transporters need to be able to identify and act on situations where the pressure in the system has fallen, or could fall, to the level at which action would need to be taken to prevent one or more supply emergencies occurring.

A "Gas Supply Emergency" is used to describe any situation which has resulted in, or could result in, a loss of pressure to consumers that would require action to prevent one or more supply emergencies occurring. T/PM/E/1 only covers gas supply emergencies that occur on the primary system. For gas supply emergencies occurring on a secondary system reference should be made to T/PM/E/2.

4.3 Network Gas Supply Emergency

A "Network Gas Supply Emergency" is any situation, which has resulted in, or could result in, a loss of pressure to consumers connected to the primary, secondary and/or supplementary system requiring action to prevent one or more supply emergencies from occurring. Insufficient gas supplies being available to the primary system or a critical transportation constraint within the primary system could cause a NGSE.

The co-ordination of the action taken by the transporters in a NGSE is the responsibility of the NEC. If a potential or actual supply emergency is identified, the NEC will request via the primary transporter, co-operation of all parties listed in GS(M)R Regulation 6(2).

5. CAUSES OF A NETWORK GAS SUPPLY EMERGENCY

In normal operation of the Network the shippers provide sufficient gas to the primary system to meet the demand of their supply points on a daily basis. GNCC continuously monitors the balance between supply and demand on the primary system. Under all normal conditions this must produce a balance between supply and demand in the primary system. However, there are exceptional conditions that could result in an imbalance between supply and demand in the primary system, or in part of the primary system, which cannot be corrected by the use of normal commercial arrangements; this imbalance may lead to a Network Gas Supply Emergency.

A Network Gas Supply Emergency could be caused by:

- a) Insufficient gas supplies available to the primary system (Gas Deficit).
 - Gas Deficit Emergency – Insufficient supplies available to the primary system.
 - Safety Monitor Breach – where there is or may be insufficient gas storage available to meet the winter demand conditions.

- b) A critical transportation constraint in the primary system.
 - This may occur when there is sufficient gas available but due to a constraint on the primary system the gas can not be transported to the correct location.

6. CLASSIFICATIONS OF A NETWORK GAS SUPPLY EMERGENCY

6.1 Gas Deficit Emergency - Insufficient Gas Supplies to the Primary System

This could occur due to a sudden event or it could develop slowly over a number of hours or days.

The foreseeable events resulting in insufficient supplies being available are:

- Failure of the Gas National Control Centre or the GNCC systems for monitoring and controlling the primary system.
- The complete or partial failure of the Uniform Network Code (UNC) market regime arrangements for delivering gas to the Network including failure to nominate sufficient gas and incorrect network demand estimation.
- Shortage of beach gas due to one or more sources of gas being outside the gas quality criteria set out in GS(M)R Parts I and/or Part II of Schedule 3.
- Shortage of storage gas at one or more storage facilities.
- A prolonged period of exceptionally cold weather exceeding the supply security criteria.
- Unplanned unavailability or capacity restriction of one or more gas processing facilities, or network entry facilities.
- Unplanned unavailability or capacity restriction at one or more storage facilities.
- Unplanned unavailability or capacity restriction of production facilities or associated pipelines due to: plant or pipeline failure, industrial action, natural disasters, severe weather, accident, acts of war or sabotage, etc.

6.2 Gas Deficit Emergency - Safety Monitor Breach

Gas shippers and suppliers are incentivised in accordance within their licences to take steps to secure gas supplies to satisfy the domestic supply security standard. This includes the 1:50 winter severity for their domestic end users.

All conveyors need to demonstrate the arrangements they have put in place to minimise the risk of a supply emergency occurring. The safe operation of all end users in a 1:50 severe winter is achieved by protecting gas consumers by allocating them to either a protected by isolation or a protected by monitor category. The primary transporter will determine the arrangements and the classification of all end users into each category.

Should end users classified as protected by isolation not respond to a request to cease using gas the conveyors will need to demonstrate that they can physically isolate them in a timely fashion. All end users not classified as protected by isolation are classified as protected by monitor.

The primary transporter determines the quantity of safety monitor gas. The safety monitor includes gas for protected by monitor end users and gas required to maintain

adequate pressure to protected by monitor end users when protected by isolation end users are being isolated from the Network.

The primary transporter monitors storage levels to ensure there is no breach of safety monitor levels. The NEC will be notified in the event of a potential or actual breach of the safety monitor as this may lead to a potential or actual gas supply emergency developing.

The NEC will not agree an emergency strategy that will result in a breach of a safety monitor until an actual supply emergency has occurred.

A potential or actual breach of the safety monitor may result in a NGSE Safety Monitor Breach Emergency being declared by the NEC.

6.3 Critical Transportation Constraint

A critical transportation constraint would arise where sufficient gas supplies are available to the primary system (from gas processing facilities and storage facilities) in aggregate but the primary transporter is unable to maintain adequate pressures at one or more system offtakes due to problems in transporting the gas within the primary system.

The foreseeable events that could result in a critical transportation constraint in the primary system are:

- Reduction in the maximum permitted operating pressure of a primary system pipeline, e.g. due to third party damage.
- Primary system demand exceeding the supply security criteria.
- The need to isolate part of the primary system due to the admittance of gas which does not meet the requirements of GS(M)R Part I or Part II of Schedule 3.
- Unplanned unavailability due to: pipeline or system plant failure, industrial action, natural disasters, severe weather, accident, and acts of war or sabotage of primary system pipelines. Planned pipeline and plant outage is taken into account by the primary transporter in the scheduling process.
- Unplanned unavailability or capacity restriction at one or more storage facilities.

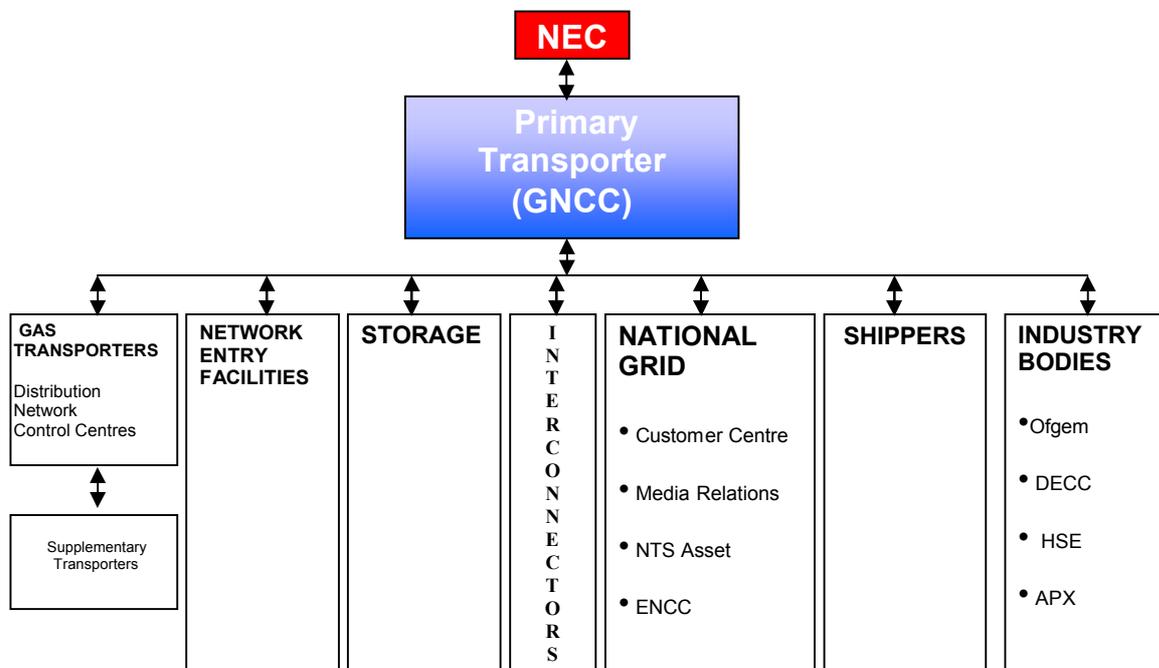
A critical transportation constraint within the primary system may result in a NGSE Critical Transportation Constraint Emergency being declared by the NEC.

7. COMMUNICATIONS

7.1 NEC Declarations

- The notification routes for the declaration of a NGSE and the notice of a potential NGSE are shown schematically in Figure 3.
- All communication routes are two way and must maintain, as far as possible, the normal communication processes taking place between the various parties in the course of the normal operation of the Network.
- Parties must avoid bypassing the communication chain in an attempt to deal directly with the NEC or the primary transporter.
- The communication medium must be agreed in advance between the parties, e.g. telephone backed up by fax or email.

Figure 3 Communication route used for NEC Declarations
NEC Communications Routes



7.2 Communications from the Primary Transporter

All parties receiving notifications from the primary transporter must have a 24 hour telephone number and a separate 24 hour fax number.

Shippers receive communications via both Active Notification System (ANS) and fax.

Communications to all other parties will be by fax (to the nominated 24 hour fax number) with details of the situation and instructions for action. Confirmation of successful fax transmission must be taken as confirmation of receipt of the message by the shipper. If no response is received from either the ANS (in the case of shippers) or the fax then

contact must be made by telephone. This should be regarded as a contingency measure due to the time involved in making individual telephone calls.

Communications made by the primary transporter will be undertaken through the following methods.

Figure 4 Communication Mediums

Recipient	Primary Method	Secondary Method (if required)	Alternative
Shippers	Active Notification System	Fax	Telephone
Gas Processing Facilities	Fax	Telephone	
Secondary Transporters	Fax	Telephone	
Supplementary Transporters	Fax	Telephone	
Network Entry Facilities	Fax	Telephone	
Storage Facilities	Fax	Telephone	
DECC, HSE, Ofgem	Fax	Telephone	
National Grid	Fax	Telephone	

All parties must be notified of any special email addresses, telephone and fax numbers for contacting the primary transporter for the duration of the gas supply emergency. All parties should avoid contacting the primary transporter unless it is essential.

8. UNIFORM NETWORK CODE

The Uniform Network Code (UNC) section Q (Emergencies) sets out the operational arrangements in place between shippers and gas transporters in the event of a gas supply emergency.

T/PM/E/1 is based on the provisions of section Q of the UNC and should be revised as a result of changes to the UNC.

UNC modification 195AV has removed the availability of NTS emergency interruption from October 2012 and modification 90 reduced the availability of Distribution Network interruption from October 2011.

The Uniform Network Code section Q authorises the primary transporter to issue direct instructions to the operator of any storage facility to deliver gas to the system if a stage 2 NGSE Gas Deficit or Critical Transportation Constraint Emergency is declared.

Figure 5 Market Arrangements during a NGSE

Stage	Critical Transportation Constraint	Gas Deficit Emergency	Safety Monitor Breach
Normal Operation	Normal commercial arrangements in place.	Normal commercial arrangements in place.	Normal commercial arrangements in place.
1	Normal commercial arrangements in place.	Normal commercial arrangements in place.	Normal commercial arrangements in place.
2	Uniform Network Code section Q provisions apply but only for additional storage gas.	Uniform Network Code section Q provisions apply.	Uniform Network Code section Q provisions apply.
3			
4	Normal commercial regime continued.	National Grid will suspend its participation in the commercial market regime.	National Grid will suspend its participation in the commercial market regime.
Normal Operation	Normal commercial arrangements in place for storage gas 06:00 hours on gas day following the declaration of the end of the NGSE.	Normal commercial arrangements in place 06:00 hours on gas day following the declaration of the end of the NGSE.	Normal commercial arrangements in place 06:00 hours on gas day following the declaration of the end of the NGSE.

9. THE PRIMARY TRANSPORTER'S EMERGENCY STRATEGY

9.1 Information Provision

The primary transporter will develop an emergency strategy to identify what stages of the NGSE are required to address the imbalance or constraint.

The following list provides a guide of the information that will be used by the primary transporter to develop the emergency strategy. Some of this information will be requested from the secondary transporters where time permits before the NEC has declared any stage.

- Estimates of the primary and secondary system supply and demand balance.
- Current and forecast gas deliveries at the beach – this can be obtained in conjunction with DECC via the Gas Availability Status report or the 5 day Situation Report.
- Potential maximum gas available at the beach.
- Potential volume and location of available gas conforming to GS(M)R Part II Schedule 3.
- Current gas deliveries to the primary system from storage facilities.
- Potential maximum gas deliverable to the primary system from storage facilities.
- Storage stock levels for primary system and storage facilities.
- Distribution Network utilisation including minimising flows through use of DN linepack and storage stocks and available contractual interruption.
- Location and nature of any capacity constraints being experienced or anticipated by conveyors, network entry facility operators and storage facility operators.
- The quantity of load identified as protected by isolation.
- The quantity and location of industrial/commercial loads available for firm load shedding.
- The quantity and location of domestic and priority load available for firm load shedding.
- Volume and location of the storage gas required to maintain safety monitor levels.

9.2 Emergency Strategy

The primary transporter will prepare an emergency strategy setting out the action necessary to restore supply-demand balance to the primary system or the affected part of the primary system. This strategy will be submitted to the NEC for approval.

The strategy adopted by the primary transporter for the restoration of the supply-demand balance has three aspects:

- The quantities of gas available to re-balance the primary system or the affected part of the primary system at stages 1 and 2.
- The lead times associated with delivering these quantities of gas to the primary system or the affected part of the primary system.
- Ability to maintain adequate safety monitor storage levels to support protected by monitor consumers throughout winter.

It is possible that sufficient quantities of gas could be available to the primary system or the affected part of the primary system to restore supply-demand balance but that it could not be delivered in time to prevent failure at one or more secondary system offtakes.

Failure could occur where the quantity of gas being delivered from the primary system to a secondary system is insufficient to meet the immediate demand of that secondary system (taking into account the gas stored within the secondary system and the load management measures in place) resulting in a fall in secondary system pressure to a level at which supplies to firm consumers are affected.

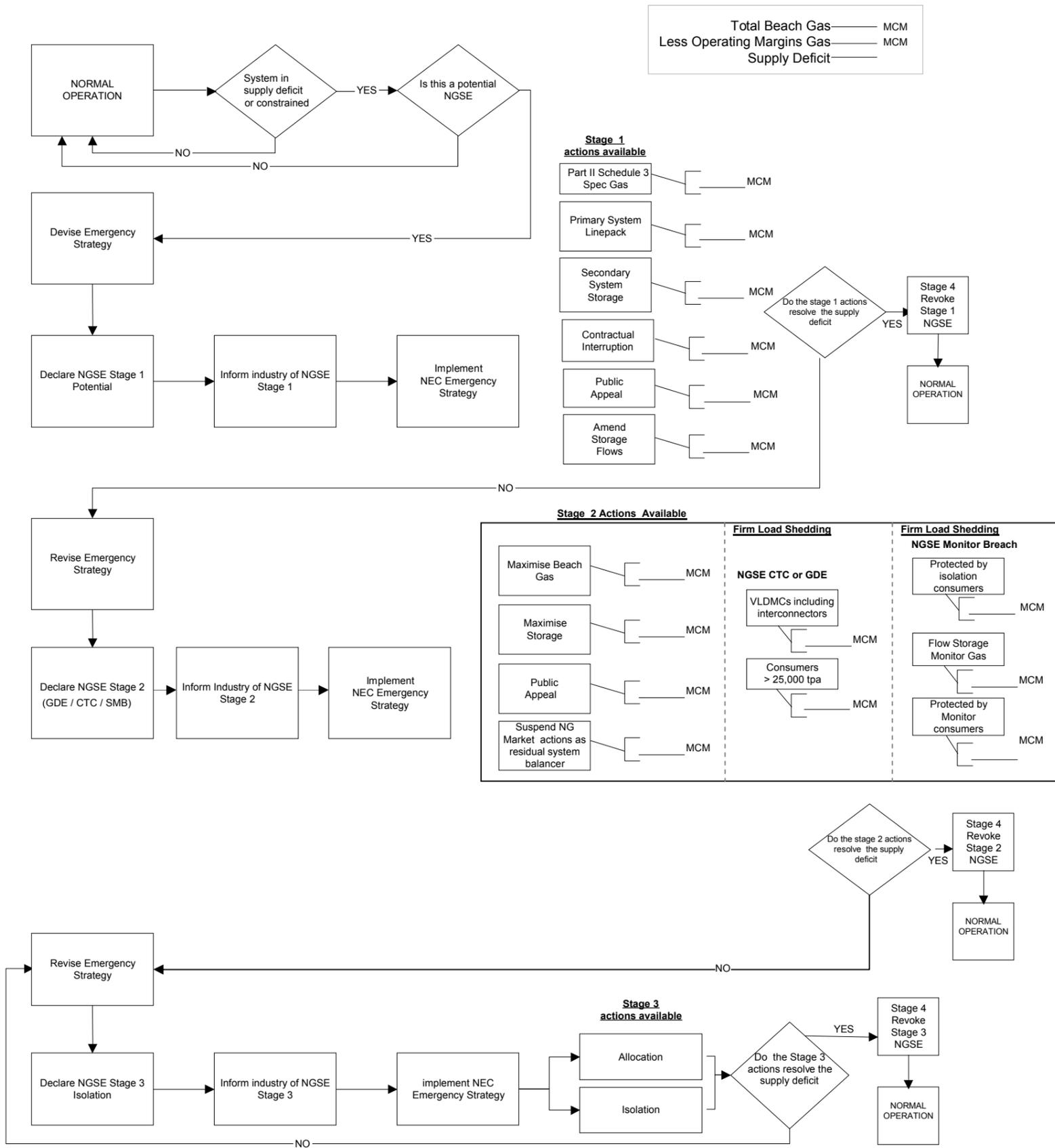
The emergency strategy provides a process for the primary transporter to match the correct amount of supplies or demand reduction measures to address the primary system imbalance.

In estimating the quantities of gas required a tolerance band is necessary for the ineffectiveness or uncertainty of each of the actions proposed. These tolerances must be stated in the emergency strategy, e.g. LNG delivery must have a high certainty of delivery time and quantity and may have a low tolerance bandwidth. Firm load shedding may be judged to be less certain in delivery time and quantity and have a higher tolerance bandwidth. The emergency strategy should be based on the mid-point of the tolerance bands if appropriate contingency actions are available to recover the situation if all the actions under-perform at the extreme tolerance limit.

The primary transporter has an Emergency Strategy Program (ESP) to assess the effects of the various lead times on the primary system and identify if, and when, failure could occur. Figure 6 shows a summary of the emergency strategy.

For the purposes of the emergency strategy the NEC and primary transporter must assume that gas delivery rates at network entry facilities should be maintained at the rates being delivered at the beginning of stage 1 and that no increase in delivery rates occur thereafter. If additional beach gas is subsequently actually delivered to the network during stages 1, 2 or 3 this must be taken into account by a revision of the emergency strategy.

Figure 6 – Emergency Strategy



10. PRIORITY CONSUMERS

Condition 6 Paragraph 17 of the Gas Transporters (GT) Licence (Gas Act 1995) requires that a gas transporter, when interrupting or restricting the conveyance of gas to any non-domestic customer, must give priority to the maintenance of the supply of gas to consumers on the priority list and the conveyance of gas to their premises.

Condition 16 states that unless it has already done so a gas transporter must establish a list of non-domestic customers who must be given priority with respect to the maintenance of a supply of gas and conveyance of gas to their premises. The gas transporter, in consultation with shippers, must review this list as often as is appropriate.

There are 3 defined types of priority consumer.

Category A

Consumers (above 25,000 tpa, 732 MWh) on firm supply contracts, where a failure in the supply to their premises could put lives at risk. Example of such consumers would be hospitals or homes for the elderly and disabled.

Category B

Consumers who would otherwise fall into category "A" but for the fact that they are on interruptible contracts. Where possible supplies to category "B" consumers will be maintained for the contractually agreed notice period used when interrupting the supply of gas under normal conditions.

Category C

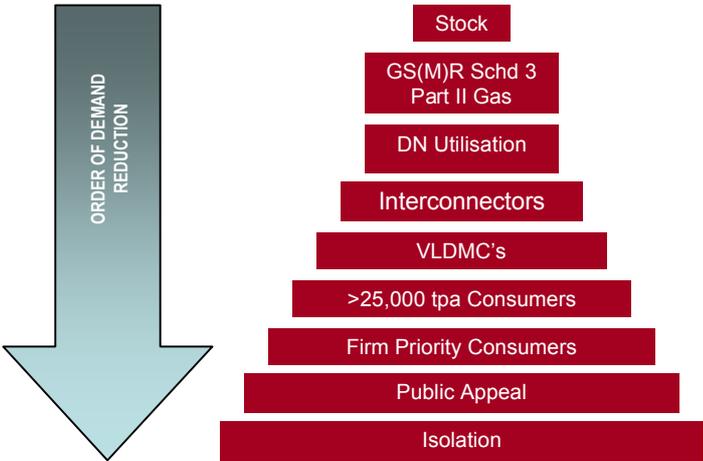
Consumers operating major items of capital plant, which require time to be safely shut, down and would sustain serious damage (£50 million or more) if gas supplies ceased suddenly. Examples of such consumers would be furnaces and glass works.

In a Network Gas Supply Emergency the primary transporter in agreement with the NEC will establish a strategy that will, where possible, maintain gas supplies for as long as practicable to priority consumers. The primary transporter will not maintain gas supplies to priority consumers if this would result in the loss of gas supplies to domestic consumers.

The JRT may interface with the primary transporter and the NEC on the action to take with respect to the priority consumers.

In developing the emergency strategy the primary transporter should adopt the following protocol.

Figure 7 – Priority Customer Protocol



When gas transporters (or shippers) make contact with large consumers for the purpose of firm load shedding, they must establish whether the consumer is a priority consumer. Subject to operating conditions, priority consumers should NOT be issued with a direction notice and must be instructed that they should continue to take gas for essential purposes and disregard public appeals to stop using gas, unless otherwise directed by the gas transporter.

If any gas transporter directs a priority consumer to cease using gas and issue a direction notice accordingly, then that priority consumer MUST cease using gas.

11. NETWORK GAS SUPPLY EMERGENCY PROCEDURE

The NEC has identified 4 clear stages to manage the different types of NGSE. Figure 8 identifies the arrangements available to the NEC at each of the different stages. Although the stages run from 1 to 4 the NEC may declare the stages sequentially or simultaneously to address the supply-demand imbalance. As the implemented measures take effect the NEC may revoke some or all of the stages until the NGSE is declared over.

Figure 8 shows the arrangements in place at each of the 4 stages

Network Gas Supply Emergency Classification			
	Gas Deficit: Insufficient Gas Supplies Available to the NTS		Critical Transportation Constraint in the NTS
Emergency Stage	Gas Deficit Emergency	Safety Monitor Breach	Critical Transportation Constraint
1 (Potential)	<ul style="list-style-type: none"> • Gas conforming to Schedule 3 Part II of GS(M)R • NTS Linepack • Distribution Network Utilisation <ul style="list-style-type: none"> ○ Distribution Network Storage ○ Emergency Interruption • Public Appeals 	<ul style="list-style-type: none"> • Instruct shippers & storage operators to amend storage flows • Distribution Network Utilisation <ul style="list-style-type: none"> ○ Emergency Interruption • Public Appeals 	<ul style="list-style-type: none"> • Gas conforming to Schedule 3 Part II of GS(M)R • NTS Linepack • Distribution Network Utilisation <ul style="list-style-type: none"> ○ Distribution Network Storage ○ Emergency Interruption • Public Appeals
2	<ul style="list-style-type: none"> • National Grid Gas plc's participation in the OCM will be suspended • Maximise Supplies • Firm Load Shedding • Public Appeals 	<ul style="list-style-type: none"> • National Grid Gas plc's participation in the OCM will be suspended • Maximise Supplies • Firm Load Shedding • Public Appeals 	<ul style="list-style-type: none"> • National Grid Gas plc will continue to participate in OCM • Maximise Storage • Firm Load Shedding • Public Appeals
3	<ul style="list-style-type: none"> • Public Appeals • Allocation & Isolation 	<ul style="list-style-type: none"> • Public Appeals • Allocation & Isolation 	<ul style="list-style-type: none"> • Public Appeals • Allocation & Isolation
4	<ul style="list-style-type: none"> • Restoration 		

Emergency Interruption will remain as an action that applies to Distribution Networks' contracted interruptible sites only.

11.1 NGSE Stage One Arrangements

11.1.1 Potential Network Gas Supply Emergency

A potential NGSE is any situation where:

A NGSE stage 1 Potential has been initiated, and the emergency strategy determines that the gas made available, or that could be made available, to the network as a result of Stage 1 actions only is equal to, or greater than, the network supply deficit identified at the beginning of stage 1 and should, or could be, delivered to the network before failure occurs.

The primary transporter in consultation with the NEC determines the emergency strategy and as a result the NEC must issue either a notice of potential NGSE or declare a stage 2 Gas Deficit or Critical Transportation Constraint NGSE.

Figure 9 Emergency actions available at Stage 1

Stage 1 Arrangements	GDE	Safety Monitor Breach	CTC
Primary System Linepack	✓	x	✓
Distribution Network Utilisation	✓	x	✓
Gas conforming to Schedule 3 Part II of GS(M)R	✓	x	✓
Amendment of Storage Delivery	x	✓	x
Public Appeal	✓	✓	✓

11.1.2a Gas conforming to Schedule 3 Part II of GS(M)R

A transporter must not convey gas in the network unless it complies with the requirements specified in GS(M)R Part I of Schedule 3, Regulation 8(1). However, the NEC may where it is necessary to prevent or delay the occurrence of a NGSE (including a potential) or a local gas supply emergency (and there is no equivalent amount of Schedule 3 Part I specification gas), authorise gas not conforming with Part I of Schedule 3 to be conveyed in the network if the gas conforms with the requirements of GS(M)R Part II of Schedule 3, Regulation 8(2). The NEC will not authorise the admittance of gas conforming to Part II of Schedule 3 when there is equivalent amount of gas conforming to Part I of Schedule 3 available.

This provision exists because there may be circumstances in which the introduction of gas conforming to Schedule 3 Part II of GS(M)R is less undesirable in safety terms than the loss of supply. The authorisation for gas conforming to Schedule 3 Part II of GS(M)R should be withdrawn once an equivalent amount of additional gas conforming to Schedule 3 Part I of GS(M)R becomes available or if the emergency has been averted. A risk assessment will be carried out to establish an acceptable duration for which gas conforming to Schedule 3 Part II of GS(M)R can be admitted into the primary system or any secondary system.

The primary transporter may relax contractual obligations within the boundaries of Part I of Schedule 3 if this would prevent a NGSE (including a potential) occurring or to minimise the safety issues if one has already occurred. However, due to time constraints this process

may be included in the NEC authorisation for the admittance of gas conforming to Part II of Schedule 3.

Figure 10 GS(M)R Gas Specification

Wobbe Number	
No Person Shall Convey Gas in the Network > 52.85 MJ/m³	
Upper Limit of gas conforming to Part II Schedule 3 > 51.41 MJ/m³ to 52.85 MJ/m³	
51.41 MJ/m³ Gas conforming to Part I Schedule 3 47.2 MJ/m³	
<47.2 MJ/m³ to 46.5 MJ/m³ Lower Limit of gas conforming to Part II Schedule 3	
No Person Shall Convey Gas in the Network < 46.5 MJ/m³	

ICF (Incomplete Combustion Factor)	
Gas conforming to Schedule 3 Part I of GS(M)R	≤ 0.48
Gas conforming to Schedule 3 Part II of GS(M)R	≤ 1.49

11.1.2b Gas conforming to Schedule 3 Part II of GS(M)R in the Network

The primary transporter must initiate the request to the NEC for the admittance of gas conforming to Schedule 3 Part II of GS(M)R, directly or indirectly (i.e. through a secondary system) into any part of the primary system or any secondary system.

The NEC will require demonstration that there is no gas conforming to Schedule 3 Part I of GS(M)R available and the gas conforming to Schedule 3 Part II of GS(M)R is required.

The relevant transporter is responsible for the operational, commercial and contractual arrangements associated with the introduction and conveyance of gas conforming to Schedule 3 Part II of GS(M)R in its system and for any necessary agreements with third parties for the supply or transportation of the gas. Sufficient tolerance on the specification must be allowed to ensure that it does not fall outside the requirements of GS(M)R Part II of Schedule 3 at any point in the network.

The relevant transporter must obtain up to date information about the approximate quantities of gas conforming to Schedule 3 Part II of GS(M)R available at relevant network entry points and/or blending points and notify the NEC via the primary transporter of the quantities available on a daily basis, or otherwise as agreed, with the NEC.

The transporter who applied for the authorisation must monitor the supply-demand situation and inform the NEC via the primary transporter when the admittance of gas conforming to Schedule 3 Part II of GS(M)R is no longer required.

The relevant transporter must inform the NEC of the earliest practicable time at which all the gas being conveyed in the network should meet the requirements of GS(M)R Part I of Schedule 3 and when all the gas being conveyed in the network actually does meet the requirements of GS(M)R Part I of Schedule 3.

The NEC must withdraw the authorisation when all the gas in the network meets the requirements of GS(M)R Part I of Schedule 3.

The NEC must issue the authorisation for the admittance and withdrawal of gas conforming to Schedule 3 Part II of GS(M)R to the primary and/or affected secondary transporters orally and/or in writing.

11.1.3 Primary System Linepack and Secondary System Storage

During stage 1 all usable primary system linepack will be utilised by the primary transporter. During the process of collecting data all secondary transporters will indicate to the primary transporter how much storage they have available. At stage 1 the primary transporter may ask the secondary transporters to release this storage by reducing the amount of gas they take from the primary system.

11.1.4 Curtailment of NTS Storage Delivery

In the event that there is likelihood that the safety monitor will or has been breached the NEC will seek co-operation from shippers and storage operators to curtail delivery of storage gas to the primary system. Shippers and storage operators should amend their flows in accordance with the primary transporter's request and undertake demand reduction measures or increase supplies to the Network to maintain a supply-demand balance. If demand reduction is required of firm consumers designated protected by isolation the NEC will declare a stage 2 NGSE.

11.1.5 Public Appeal

If approved by the NEC the primary transporter may instigate the use of public appeal. For a potential transportation constraint the primary transporter may instigate the use of public appeal through the affected secondary transporters. The affected secondary transporters will implement public appeals in line with their operational emergency procedures.

For a potential supply-demand imbalance or where the transportation constraint impacts a large number of secondary systems the public appeal process will be co-ordinated centrally. The Joint Response Team will deliver these centrally co-ordinated public appeals using their Incident Response Plan (IRP). Affected secondary transporters will contribute to the delivery of this centrally co-ordinated media appeal through their communication process.

Public appeal targets domestic and smaller industrial/commercial consumers (<25,000 tpa). The method for communicating the public appeal messages could include public appeal broadcasts over the radio or television or loud hailer vans touring the streets. Posters and leaflets drops should also be used.

Public appeals are made in two phases:

- (i) An appeal to "use as little gas as possible".
- (ii) An appeal "to stop using gas".

It is anticipated that the effect of public appeals would diminish as time passes and that they would need to be repeated and reinforced at frequent intervals and eventually it is possible that the reduction in demand from the appeals would be insufficient to maintain the pressure at the extremities of one or more secondary systems.

It is the responsibility of the affected gas transporter to monitor the effectiveness of public appeals and to repeat as necessary. If the public appeals are being co-ordinated centrally then the primary transporter will request additional appeals as required.

11.2 NGSE Stage Two Arrangements

11.2.1 Declaration of a Gas Deficit, Safety Monitor Breach or Critical Transportation Constraint Network Gas Supply Emergency

If the arrangements available to the primary transporter at stage 1 are insufficient to address the supply demand-imbalance or the transportation constraint the NEC will consider authorising a stage 2 Network Gas Supply Emergency. A stage 2 NGSE will exist when there is no action available to the primary transporter that could be taken in the time available to re-balance the primary system without the recourse to measures available in stage 2.

Upon declaration of a stage 2 NGSE the NEC will categorise the type of NGSE that exists. The NEC may declare the following types of Network Gas Supply Emergency.

a) Critical Transportation Constraint (CTC)

A CTC will exist when the primary transporter and the NEC agree that the primary transporter will be unable to maintain adequate pressure at one or more primary system offtakes during the current gas day or the next gas day.

b) Gas Deficit Emergency (GDE)

A GDE will exist when the primary transporter and the NEC agree that the primary transporter will be unable to maintain an acceptable balance between supply and demand for the current gas day or the next gas day.

c) Safety Monitor Breach

A Safety Monitor Breach will exist when the primary transporter and the NEC agree there is a potential or actual breach of the safety monitor.

If at any time during a NGSE Critical Transportation Constraint Emergency, additional shipper beach gas would be beneficial in the management of the emergency, the NEC would re-declare the emergency as a NGSE Gas Deficit Emergency.

Figure 11 Emergency actions available at Stage 2

Stage 2 Arrangements	GDE	Safety Monitor Breach	CTC
Maximise Beach Gas	✓	x	✓
Maximise Storage Deliveries	✓	✓	✓
Public Appeal	✓	✓	✓
Suspend National Grid's Residual Balancer role in the OCM	✓	✓	x
Firm Load Shedding	✓	✓	✓

NOTE - Neither National Grid nor the NEC has any special arrangements with producers, field operators, suppliers or any other party for the supply of gas to the Network in a NGSE. Under the duty to co-operate the NEC would expect all gas supplies to be made available and be delivered to the primary system during a NGSE.

11.2.2 Maximising Beach Gas

If it has been identified that there are additional beach gas supplies available then the primary transporter will request that shippers should source as much gas as they can and arrange for delivery to the relevant entry facilities. Communications between DECC and the terminal operators will have identified how much gas can be delivered and its associated delivery timescales. Shippers should source this gas and inform the primary transporter of what can be delivered through the appropriate channels.

If it is identified that this additional beach gas can only be made available through the use of an Order in Council the primary transporter will communicate with DECC's Joint Response Team to discuss this strategy.

11.2.3 Maximising Delivery of Non-Safety Monitor Storage Gas

If it has been identified that there is additional primary system storage gas available over and above that already being delivered or being made available for use the NEC will request the primary transporter to make arrangements for the delivery of this storage gas.

Uniform Network Code section Q authorises the primary transporter to issue direct instructions to the operator of any storage facility to deliver gas to the system if a stage 2 NGSE Gas Deficit or Critical Transportation Constraint Emergency is declared. For determining the emergency strategy the stock of storage gas should be run down to, but not below, the relevant safety monitor level.

The primary transporter will communicate directly with the storage operators for the delivery of this gas in accordance with the primary transporter's operational procedures.

11.2.4 Suspending National Grid's Role as Residual System Balancer in the On-the-Day Commodity Market (OCM) – GDE and Safety Monitor Breach Only

Once a stage 2 GDE or Safety Monitor Breach has been declared, the primary transporter will contact the operator of the OCM to inform of the suspension of National Grid's role as residual system balancer with immediate effect. Shippers will continue to be able to trade.

Once the NGSE is declared over, the OCM market operator will be contacted to reinstate National Grid's residual system balancer role with effect from 06:00 hours on the next gas day.

11.2.5 Use of Public Appeal

See stage 1 arrangements for use of public appeal.

11.2.6 Firm Load Shedding

Firm load shedding is the procedure used by transporters to secure a graduated and controlled reduction in firm demand on all or part of their systems in order to keep the system securely pressurised. The process of firm load shedding should not be confused with the loss of firm load caused by isolation of systems or parts of systems where the pressure is completely lost or reduced below the level at which appliances operate normally thus creating the potential for one or more supply emergencies occurring when the pressure is restored. The risk of a supply emergency occurring is directly related to the number of consumers affected and the parts of the network systems most at risk are clearly those supplying the 20 million plus domestic consumers.

In developing the emergency strategy the NEC and primary transporter give priority to maintaining the pressure in these parts of the network when considering firm load shedding.

The primary transporter will identify in the emergency strategy the volume and location of the firm load shedding required. If the emergency strategy identifies the need for load shedding in a secondary system, the primary transporter will communicate with the relevant gas transporter the volume to be shed. It is the responsibility of the relevant gas transporter to maintain a supply-demand balance in their part of the network. In the event that the primary transporter requests load shedding in a secondary system it is the responsibility of the secondary transporter to ensure this is implemented.

The primary transporter must determine the actual effect of the measures by continuously monitoring the offtake of gas from the primary system and updating the NEC. If the supply-demand imbalance is deteriorating, the primary transporter in consultation with the NEC must revise the emergency strategy and increase the quantity of firm load shedding or it should request the NEC to escalate the NGSE to stage 3.

Figure 12 shows the tranches of firm load shedding implemented during a stage 2 NGSE. In a Safety Monitor Breach NGSE loads above 2 mtpa are classified as protected by isolation. These would be the first tranche of firm load to be shed at stage 2 of this type of NGSE.

Figure 12 Comparison of load shedding between GDE, CTC and Safety Monitor Breach

CTC / GDE	Safety Monitor Breach
Very Large Daily Metered Consumers	Protected by Isolation (>2M tpa)
Consumers >25,000 tpa	Flow Safety Monitor Storage Gas
	Protected By Monitor (<2M tpa)
Public Appeal Message 1	Protected By Monitor (<25,000 tpa via Public Appeal messages)

If further load reduction was required consumers > 25,000 tpa would be contacted by secondary transporters or shippers and load shed. Public appeal messages would be used to reduce load < 25,000 tpa.

Although the terminology is different between the categories of consumer for a GDE and CTC emergency and that of a Safety Monitor Breach emergency the process for contacting these consumers is the same.

11.2.6a Firm Load Shedding - Critical Transportation Constraint, Gas Deficit or Safety Monitor Breach Network Gas Supply Emergency

If the previous arrangements available to the primary transporter at stage 2 are insufficient to address the supply-demand imbalance or the transportation constraint the NEC will consider authorising firm load shedding. Firm load shedding will exist when there is no action available to the primary transporter that could be taken in the time available to re-balance the primary system without the recourse to firm load shedding.

Figure 13 Firm load shedding actions available to the primary transporter at stage 2 of a Gas Deficit Emergency or a Critical Transportation Constraint

Stage 2 Firm Load Shedding – CTC-GDE	GDE	CTC
VLDMCs including Interconnectors	✓	✓
Consumers >25,000 tpa (732 MWh)	✓	✓
Public Appeal	✓	✓

Figure 14 Firm load shedding actions available to the primary transporter at stage 2 of a Safety Monitor Breach

Stage 2 Firm Load Shedding	Safety Monitor Breach
Protected by isolation Consumers (Firm)	✓
Public Appeal Message 1	✓
Flow Storage Monitor Gas	✓
Protected by Monitor Consumers	✓
Public Appeal Message 2	✓

Figures 13 and 14 identify the different arrangements in place for managing a GDE, CTC and a Safety Monitor Breach. During stage 2 firm load shedding, firm consumers would normally be contacted in order of load size with the largest users of gas first, however, there may be circumstances where this is not desirable. This may be through the

requirement of maintaining supplies to large priority consumers or under direction from the JRT to maintain supplies to specific consumers, e.g. to maintain supplies to some electricity producers. The primary transporter will consider the above factors when developing the emergency strategy. Any communications or instructions from the primary transporter will clearly identify any special arrangements, i.e. supplies to some or all priority consumers are to be maintained.

11.2.6b Arrangements for Firm Load Shedding in a NGSE Gas Deficit, Safety Monitor Breach and Critical Transportation Constraint

Firm load shedding is put into effect by the primary, secondary and supplementary transporters initiating arrangements for making direct or indirect contact with large firm consumers and instructing them that they must stop or reduce their consumption of gas.

To assist the load shedding process gas transporters may seek co-operation from shippers and suppliers to contact consumers on behalf of the transporter. If this approach is adopted it is essential that all consumers understand that the supplier is operating under the directions of the transporter and that consumers are aware of the need to follow any directions issued by the transporter.

11.2.6c Primary System Firm Load Shedding

The primary transporter is responsible for contacting all firm loads directly connected to the primary system (Very Large Daily Metered Consumers (VLDMCs)) and directing them to cease taking gas. Where time permits the primary transporter when making contact with the VLDMC will issue a direction notice pursuant to GS(M)R Regulation 6(4).

If the primary transporter is unable to make direct contact with one or more firm consumers for whatever reason for the purpose of firm load shedding they will contact the shipper.

The primary transporter will monitor the response of the firm consumers connected to the primary system. If the consumer fails to co-operate with the direction to cease using gas the primary transporter may take action to physically isolate the site from the primary system.

The primary transporter will communicate with the affected shippers that their sites have been instructed to cease taking gas.

In the case of secondary systems that export gas from Great Britain the primary transporter will implement demand reduction measures that are achievable without causing adverse implications on the system where the load arises. From the information continually gathered throughout the NGSE (including stage 1 potential) the NEC and primary transporter, in conjunction with the JRT where applicable, will ensure that the most appropriate demand reduction strategy is identified.

This strategy may involve reducing secondary systems supply from the primary system to zero in line with the category of consumer they have been aligned with, e.g. VLDMCs, protected by monitor, protected by isolation. These secondary systems will not be requested to go to zero where it can be demonstrated that the reduction would directly impact on domestic consumers and cause a supply emergency where the load arises.

In the event that domestic consumers would be directly affected by these secondary systems continuing taking gas from the primary system the primary transporter in conjunction with NEC will implement a percentage demand reduction strategy.

The relevant secondary transporter will be instructed by the primary transporter on behalf of the NEC to reduce its hourly offtake of gas from the primary system so that its daily offtake of gas is reduced by a percentage equal to the amount of the actual, or anticipated, overall supply deficit in the affected secondary systems and the affected part of the primary system on that gas day. This reduction will be expressed as a percentage of firm demand in the affected secondary systems and affected part of the primary system.

The percentage reduction will be reviewed from time to time by the NEC and should increase or decrease according to the prevailing supply-demand conditions. The reduction in offtake quantity must be in force until revoked by the NEC.

If the firm load deficit in the affected secondary systems is likely to affect the supply to domestic consumers in those systems in Great Britain, such that there is an increased risk of a supply emergency as defined in the GS(M)R, then it should be necessary on safety grounds, to further reduce or cease flows through these systems.

The primary transporter must only invoke the arrangements described above when it can be demonstrated that domestic consumers in Great Britain will be directly affected. This would usually be after public appeal has proved inadequate.

The primary transporter, if instructed to do so by the NEC, must physically restrict the flow at any secondary system offtake point if the required reduction in flow is not apparent within a reasonable time of the instruction being given. If it is not possible to physically restrict the flow then isolation of the secondary system must take place.

11.2.6d Secondary System Firm Load Shedding

Secondary transporters are responsible for contacting all firm loads directly connected to their system to direct them to cease taking gas. The primary transporter will provide the required volume that needs to be shed. The primary transporter may request specific sites to be maintained or shed.

The secondary transporter is responsible for contacting all VLDMCs connected to their secondary system. Where time permits, the secondary transporter should issue a direction notice pursuant to GS(M)R regulation 6(4) when contacting consumers.

The secondary transporter may contact large firm consumers direct or they may seek co-operation from shippers and suppliers to contact the consumer for the purpose of load shedding.

If the shipper is contacting consumers on behalf of the gas transporter no direction notice pursuant to GS(M)R regulation 6(4) must be issued at this time. This is due the difficulty for the gas transporter to generate and issue large numbers of direction notices quickly and the shipper will be making contact with the consumer at this time. As speed is a priority the benefits of rapid response would be lost if this was attempted.

11.2.6e Supplementary Systems Firm Load Shedding

Supplementary transporters are responsible for contacting all firm loads directly connected to their system to direct them to cease taking gas. The secondary transporter will provide the required volume that needs to be shed. The secondary transporter may request specific sites to be maintained or shed.

The supplementary transporter is responsible for contacting all VLDMCs and other firm consumers connected to their system. Where time permits, the supplementary transporter should issue a direction notice pursuant to GS(M)R regulation 6(4) when contacting consumers.

11.2.6f Progress of Firm Load Shedding

In order for firm load shedding to be effective, it is essential that firm consumers be contacted rapidly. The following response criteria have been set to ensure that those involved in the firm load shedding process can plan their resources and systems appropriately.

Figure 15 provides an indicative time that each transporter should be able to contact all the relevant category of consumers connected to their part of the network once instructed by the primary transporter. In the event the transporter uses the shippers to contact consumers, a timescale has been provided for completeness.

The update column is an indication of the timeliness of regular updates to the relevant transporter on progress of the firm load shedding process, when the contacting of all relevant consumers is complete and to inform of any consumers that have failed to stop taking gas when requested to do so.

The primary transporter will update their Network Emergency Management Team (NEMT).

Figure 15 Contact times for the purpose of Firm Load Shedding

System	VLDMCs CTC/GDE	>100,000 tpa CTC/GDE	Protected by Isolation Safety Monitor Breach	Update
Primary (P/T)	30 mins	N/A	60 mins	60 mins NEMT
Secondary (S/T)	30 mins	180 mins	180 mins	60 mins Contact P/T
Supplementary	30 mins	180 mins	180 mins	60 mins Contact S/T
Shipper	30 mins	180 mins	180 mins	Contact relevant transporter as required

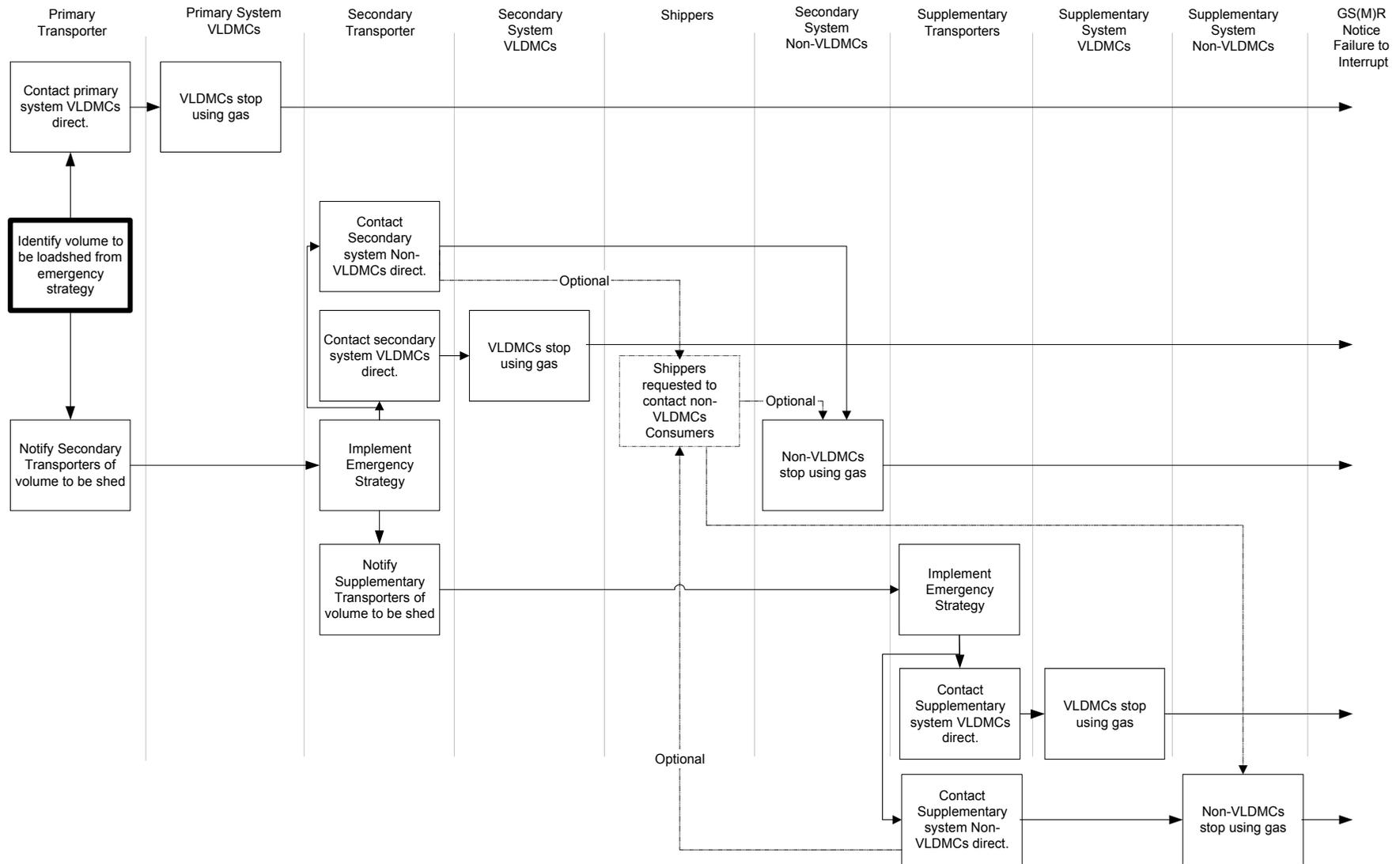
Customers using >25,000 tpa and those who fall into the protected by monitor category should be contacted on a best endeavours basis, however, the swifter contact is made the greater the contribution to resolving the supply-demand imbalance on the Network.

11.2.6g Firm Load Shedding Failure to Cease Taking Gas - All Transporters

Where, having been given a direction by a shipper on the direction of the gas transporter, a firm consumer fails to stop using gas in the shortest and safest practicable time the relevant gas transporter must issue a direction to stop using gas pursuant to GS(M)R Regulation 6(4) if the transporter determines that the failure to interrupt results in a risk to system security.

Where a firm consumer has failed to cease taking gas and in the judgement of the gas transporter, thereby puts supply security at risk (irrespective of whether a direction notice pursuant to GS(M)R regulation 6(4) has been issued) the transporter should take any steps available to it to isolate or disconnect any or all supply meter points (irrespective of whether any is a shared meter point) comprised in the supply point. See Uniform Network Code section G, e.g. the gas transporter should cut off the supply to the premises by cutting or isolating the supplying main or by closing the meter control valve(s).

Figure 16 Firm Load Shedding



11.2.7 Flowing Safety Monitor Storage Gas

In the event that load shedding of the protected by isolation consumers and where applicable the use of public appeal does not address the supply-demand imbalance, the NEC may request the primary transporter to flow Safety Monitor Storage gas to maintain supply to protected by monitor consumers. The strategy developed by the primary transporter will identify how much gas should flow and from what storage facilities.

The primary transporter will not flow gas that is required for the orderly run down of the system at stage 3.

The primary transporter will contact the shippers and storage operators to make arrangements for the requested gas to flow into the primary system.

11.2.8 Public Appeal

See stage 1 arrangements for use of public appeal.

11.3 NGSE Stage Three Arrangements

11.3.1 Allocation of Available Gas and System Isolation, Critical Transportation Constraint, Gas Deficit or Safety Monitor Breach Emergency

If the firm load shedding arrangements available to the primary transporter at stage 2 are insufficient to address the supply-demand imbalance or the transportation constraint the NEC will consider authorising a stage 3 Network Gas Supply Emergency. A stage 3 NGSE will exist when there is no action available to the primary transporter that could be taken in the time available to re-balance the primary system without the recourse to measures available in stage 3.

The arrangements available to the primary transporter at stage 3 of a Gas Deficit Emergency, Safety Monitor Breach or a Critical Transportation Constraint are shown in Figure 17.

Figure 17 Emergency actions available at Stage 3

Stage 3 Arrangements	GDE	Safety Monitor Breach	CTC
Allocation of Available Supplies	✓	✓	✓
Isolation of secondary systems	✓	✓	✓

In the event that insufficient supplies are available from the primary system, isolation of secondary systems may be required. To support this process the JRT have arrangements in place for providing additional resources to affected transporters in the event of individual domestic consumers requiring isolation from the Network.

The JRT also has arrangements in place to facilitate the use of self-isolation and self-restoration media material. The JRT in conjunction with the NEC will confirm if this approach is to be implemented.

11.3.2 Allocation of Available Supplies

If insufficient gas is available to supply the network or parts of the network as applicable, even with firm load shedding, the NEC allocates the available gas to secondary systems and must instruct the primary transporter to physically restrict the offtake of gas by secondary systems to the allocated amount. If secondary transporters are unable to maintain acceptable minimum pressures in their systems they must apply to the NEC via the primary transporter for an increased allocation. If no additional gas allocation is possible, the affected secondary transporters in liaison with the associated supplementary transporters must isolate their systems, or part of their systems, in order to reduce demand to match the allocation available from the primary system and preserve the pressure in the transmission pipelines (>7 bar).

Those parts of the network supplying domestic consumers are particularly vulnerable to supply emergencies due to the large number of individual consumers taking gas from the Network. The NEC's arrangements for allocation of gas, therefore, gives priority to maintaining gas supplies to secondary systems supplying domestic consumers.

The criteria for the allocation of gas to secondary systems and associated supplementary systems are as follows:

a) The NEC must issue gas allocations directly to the primary transporter. The primary transporter must notify the secondary transporters (including transporters exporting gas from Great Britain) of their allocations. Secondary transporters must liaise with their associated supplementary transporters on the affect of the allocations.

b) The primary, secondary and supplementary transporters must be responsible for maintaining the supply-demand balance within their parts of the network and protecting supplies to domestic consumers by appropriate demand management which could include more frequent public appeals, or physical isolation of industrial/commercial premises.

c) The NEC and the primary transporter in liaison with the secondary transporters must review the allocation of gas across all the secondary systems to determine if any systems have "surplus" allocated gas that could be redistributed to those systems in "deficit".

11.3.3 System Isolation

If the NEC is unable to increase the allocation of gas to one or more secondary systems it must in consultation with the primary and secondary transporters and DECC review the allocation of gas in order to match network supply and demand by selected system isolation by either:

- Maintaining partial supplies to all affected secondary systems and associated supplementary systems with some consumers isolated in each affected secondary system with the possibility of supplementary systems being isolated also; or
- Maintaining full supplies to one or more secondary systems whilst isolating some or all consumers in one or more other secondary and associated supplementary systems.
- Where a secondary transporter is not allocated sufficient gas to maintain minimum pressures at the extremities of its system it must take steps to isolate

the extremities of those systems to maintain the pressure in the upstream pipelines operating at 7 bar or above. This should protect the primary system and preserve the bulk transportation capability of the secondary system for as long as possible.

Isolation of these lower pressure systems should result in a loss of gas pressure to consumers.

Each transporter should use their own procedure for system isolation identified in their operational procedures.

Through regular communications with the affected secondary transporters the primary transporter will monitor the actual effect of the measures implemented during stage 3.

If the supply-demand imbalance is deteriorating, the NEC will direct the primary transporter to reduce the gas allocation until the primary system can maintain a supply-demand balance. This may require all secondary systems to be isolated.

At this point the network is now completely shut down with pressure maintained in all systems above 7 bar.

If the supply-demand balance is improving the NEC must authorise the primary transporter to progress to stage 4 - restoration.

11.4 NGSE Stage Four Arrangements

11.4.1 System Restoration, Gas Deficit Emergency, Safety Monitor Breach or Critical Transportation Constraint Emergency

When sufficient supplies are available to restore pressure to isolated systems or revoke emergency actions taken during stage 1, 2 and 3 the NEC must initiate the restoration process and, on completion, declare the end of the NGSE. The primary transporter must communicate the revocation as detailed in section 7 - Communications.

11.4.2 Restoration

If the supply-demand balance is improving, the primary transporter will develop a strategy to progressively revoke the measures taken during the various stages of the emergency. The primary transporter will propose a strategy for the NEC to approve and co-ordinate the actions of secondary transporters to revoke emergency measures on secondary systems. Secondary transporters must co-ordinate actions with the supplementary transporters to revoke the emergency measures taken on supplementary systems.

If allocation and isolation actions have been taken during the emergency it is likely to take a considerable amount of time to restore all affected customers. When the supply situation has returned to normal and restoration has been completed, apart from those in sections of the network isolated at stage 3, the NEC must notify the primary transporter of the revocation of the NGSE.

To help facilitate restoration of their systems, secondary transporters may declare a Local Gas Supply Emergency. This process does not affect the ability of the NEC to revoke any stage nor declare the end of the NGSE.

11.4.3 Restoration Procedure

The restoration procedure could be affected by the weather conditions, the available supply sources and the availability of primary system and secondary system plant and pipelines. There are many permutations and it is not practicable for gas transporters to prepare detailed specific restoration procedures in advance.

Certain basic principles must be applied to the process of restoration:

- No restoration of end users will take place until and unless the security of the primary system is assured.
- Restoration of end users is matched to available primary system supply.
- In the event of a Safety Monitor Breach being declared, the safety monitor will be restored by injection to the affected storage facilities. LNG storage has a lower injection capability and so other storage sites may need to increase their levels to compensate for the lower LNG injection rates. These actions or any alternative actions must be agreed by the NEC.
- The actions taken by the relevant conveyors are co-ordinated by the NEC. Where more than one secondary system has been affected the NEC consults with the primary transporter and may consult with the JRT on the restoration priorities.
- Restoration of supplies to systems operating below 7 bar may take a long time due to the complexity of the system and the large numbers of consumers involved. Where there is sufficient quantity of gas available the supplies to industrial/commercial consumers (including VLDMCs) supplied from higher pressure systems may be restored before domestic consumers.
- Affected transporters must prepare procedures before commencing restoration of pressure in order to avoid a supply emergency arising or continuing in any part of its system during the restoration process.

If required, the JRT may have arrangements in place to facilitate the restoration process through the provision of additional resources or the implementation of self-restoration. These options would be progressed in conjunction with the Distribution Networks.

12. ROLES AND RESPONSIBILITIES

The following section outlines the responsibilities of the NEC and primary transporter during a gas supply emergency on the primary system. These responsibilities provide a high level overview and act as a reference guide. They do not replace detailed operational procedures that would be followed during a NGSE.

12.1 NEC Responsibility

Stage 1	GDE	Safety Monitor Breach	CTC	NEC Actions
Establish if there is a NGSE	✓	✓	✓	Identify from the strategy proposed by the primary transporter whether a potential or actual NGSE exists.
Declare NGSE (applies to all stages)	✓	✓	✓	Approve the strategy and declare the required stage.
Gas conforming to Schedule 3 Part II of GS(M)R	✓	x	✓	The NEC may authorise the admittance of gas conforming to GS(M)R Part II Schedule 3 to the network if it would prevent, as far as possible, a supply emergency developing, and where it cannot be prevented, admit gas conforming to Schedule 3 Part II of GS(M)R to minimise the safety consequences of the emergency.
Communications (applies to all stages)	✓	✓	✓	NEC will issue a notice, via the primary transporter, of the NGSE stage setting out the nature and location of the problem, the action required to avert escalation to the next stage and the time by which the remedial action must be taken. The NEC will request transporters to implement the strategy identified by the primary transporter and seek co-operation from those parties listed in GS(M)R Regulation 6(2).
Public Appeal (applies to stages 1 to 3)	✓	✓	✓	Although the NEC normally only authorises the use of public appeals to conserve or stop using gas during stage 2 of a NGSE, the NEC may direct gas conveyors to call for Public Appeal at other stages if this would further prevent the deterioration of the situation.
Escalation to next stage (applies to stages 1 and 2)	✓	✓	✓	If the supply-demand imbalance is deteriorating the NEC may escalate the NGSE to the next emergency stage.

	GDE	Safety Monitor Breach	CTC	NEC Actions
Revocation of stage (applies to stages 1, 2 and 3)	✓	✓	✓	If the supply-demand imbalance is improving the NEC may authorise the primary transporter to progress to NGSE stage 4, restoration.
Stage 2				
Communicate with the JRT	✓	✓	x	Liaise with the JRT if additional gas is available via the use of an Order in Council.
Review Strategy and Firm Load Shedding quantities	✓	✓	✓	NEC directs the conveyors to physically restrict the flow at an end user if the required reduction in flow is not apparent in agreed timescales.
Stage 3				
Allocation	✓	✓	✓	NEC authorises gas allocation directions to the primary transporter and relevant secondary transporters.
Allocation review	✓	✓	✓	NEC in consultation with the primary transporter and the relevant secondary transporter will review the allocation of gas in order to match network supply and demand.
Isolation	✓	✓	✓	If necessary the NEC may authorise further reductions in gas allocation until a gas supply-demand balance is achieved on the primary system.
Stage 4				
Restoration	✓	✓	✓	NEC may instruct the primary transporter to progressively revoke the measures taken during the emergency.
Revocation of the NGSE	✓	✓	✓	When the supply-demand imbalance is resolved the NEC notifies the primary and secondary transporters of the revocation of the NGSE.

12.2 Primary Transporter Responsibility

Stage 1	GDE	Safety Monitor Breach	CTC	Primary Transporter Actions
Develop emergency strategy	✓	✓	✓	Develop an emergency strategy.
DN Utilisation	✓	✓	✓	Seek co-operation from gas transporters to reduce their take from the primary system by releasing storage from their secondary system and any contractual interruption.
Use of primary system (NTS) Linepack	✓	x	✓	Optimise use of primary system linepack.
Curtail storage delivery to the primary system	x	✓	x	The primary transporter will request those relevant storage operators and shippers to curtail their delivery of storage gas to the primary system.
Gas conforming to Schedule 3 Part II of GS(M)R	✓	x	✓	Demonstrate to the NEC the requirement for the admittance of gas conforming to GS(M)R Part II Schedule 3.
Revocation of Stage 1	✓	✓	✓	Progress to NGSE stage 4, restoration.
Stage 2				
Suspend National Grid's residual balancing role in the OCM. Shippers continue to trade	✓	✓	x	Uniform Network Code states that National Grid's market activities will be suspended in a Gas Deficit Emergency from declaration of stage 2.
Implement Emergency Strategy	✓	✓	✓	Requests implementation of measures set out in emergency strategy.
Communicate with the JRT	✓	✓	x	Liaise with the NEC and JRT if additional gas is available via the use of an Order in Council.
Progression to Stage 4 Restoration	✓	✓	✓	Progress to NGSE stage 4, restoration.
Firm Load Shedding	✓	✓	✓	Implement established arrangements for firm load shedding and request secondary transporters to implement their arrangements.

Specification of Firm Load reduction	✓	✓	✓	Identify the reduction in gas demand in the affected system or systems for each conveyor.
Review Strategy and Firm Load Shedding quantities	✓	✓	✓	Physically restrict the flow at an end user if the required reduction in flow is not apparent in agreed timescales.
Public Appeal	✓	✓	✓	Notify secondary transporters to commence public appeals.
Progression to 4 Restoration	✓	✓	✓	Progress to NGSE stage 4, restoration.
Stage 3				
Allocation	✓	✓	✓	Notify secondary transporters of allocations.
Allocation review	✓	✓	✓	In consultation with the NEC and the relevant secondary transporters review the allocation of gas in order to match network supply and demand.
Progression to Stage 4 Restoration	✓	✓	✓	Progress to NGSE stage 4, restoration.
Stage 4				
Restoration after Stages 1 and 2	✓	✓	✓	Progressively revoke the measures taken during stages 1 and 2.
Re-instatement of National Grid's residual balancing role in the OCM.	✓	✓	✗	Re-instatement of National Grid's residual balancing role in the OCM. will be take place at start of next gas day. (Market not suspended in a CTC).
Restoration after Stage 3	✓	✓	✓	Progressively revoke the measures taken during stages 1, 2 and 3.
Restoration after Isolation	✓	✓	✓	No restoration of end users will take place until and unless the security of the primary system is assured.

13. GLOSSARY

Additional Gas	Gas that would be available to the Network at stage 2, (using whatever existing arrangements the primary transporter has in place for the delivery of such gas), but is either not available, or is not offered, to the Network at stage 1.
ANS	Active Notification System, one of the mediums used by GNCC to communicate with the shippers.
Blending Point	A point where out of specification gas is mixed with other gas on the network to produce a gas of a new composition which is within the specification set out in GS(M)R Part I of Schedule 3*. *GS(M)R Guidance Note: Paragraph 14
Critical Transportation Constraint	Where there are sufficient gas supplies available to the primary system in aggregate but the primary transporter is unable to maintain adequate offtake pressures at one or more secondary system offtakes due to problems in transporting the gas within the primary system.
DFN (Daily Flow Nomination)	A Daily Flow Nomination is the notification to the primary transporter of the planned flow from the terminal for the next gas day.
DMC (Daily Metered Consumer)	Daily Metered Consumer supply points are firm or interruptible supply points where the meter is read every day. The meter readings are stored in dataloggers at each site and downloaded by telephone every day. DM supply points taking more than 2 mtpa are individually nominated.
DECC	Department for Energy and Climate Change.
Duty Holder (GS(M)R)	A person conveying gas in the network. A duty holder may undertake the management of the gas flow within its system itself or it may delegate the performance of the duties to another person.
DN Utilisation	Includes releasing available gas from secondary system through storage or any available contractual Interruption. The notice period and restriction on the number of days of interruption is waived during an emergency.
ESP	Emergency strategy programme used by GNCC to estimate the status of the primary system during an emergency.
Firm Load Shedding	The procedure used by transporters to secure a graduated, controlled, reduction in firm demand on all or part of their system in order to keep the system fully pressurised.* *Whilst the Network is fully pressurised there is no possibility of a supply emergency occurring.
Firm Supply Point	A supply point where the offtake of gas is not subject to contractual interruption.

Gas Processing Facility	Any gas processing facility which:- a. blends or purifies gas, removes from gas any constituent gases or separates from gas any oil or water; and b. is situated at a terminal which receives gas directly or indirectly from a gas production facility.
Gas Supply Emergency	Any situation which has resulted in, or could result in, a loss of pressure to consumers which would require action to prevent one or more supply emergencies occurring.
GFN (Gas Flow Nominations)	A Gas Flow Nomination* is the means by which the shipper advises National Grid how much gas it requires National Grid to transport or store on a certain gas day**. *Uniform Network Code Section C **A gas day runs for 24 hours starting from 06:00 hours.
GS(M)R	Gas Safety (Management) Regulations 1996.
GT (Gas Transporter)	Own and operate a pipeline system for the supply of gas to a customer base that may include domestic customers. There are also transporters of gas that are not licensed GTs. They own and operate pipeline systems that do not supply domestic customers. Several of the systems taking gas from the NTS fall into this category. The GS(M)R applies equally to those transporters that hold a GT licence and those that do not.
HSE	Health & Safety Executive.
IGMS	Integrated Gas Management System.
IMO	Independent Market Operator.
Interruptible Supply Point	A supply point where the offtake of gas is subject to interruption in accordance with the Uniform Network Code Section G Paragraph 6.
Interruption	The procedure whereby, by prior agreement, Distribution Networks direct shippers to stop the offtake of gas at specified* industrial/commercial supply points. * Interruptible supply points must have an estimated gas usage >200,000 tpa.
LDZ	Local Distribution Zone.
Linepack	A function of volume and pressure. Linepack is required for normal operation. In a gas supply emergency there may be a surplus linepack available, the quantity determined by location and demand conditions.
LNG	A Liquefied Natural Gas facility is a storage facility in which gas is liquefied, stored as LNG and either re-gasified for purposes of withdrawal or withdrawn as LNG by tanker.

Local Gas Supply Emergency	Any situation which has resulted in, or could result in, a loss of pressure to consumers which would require action to prevent one or more supply emergencies occurring, and where the loss of pressure is caused by a fault in plant or pipes within the secondary or supplementary system, i.e. sufficient gas is available from the primary system.
GNCC	Gas National Control Centre (National Grid).
NDM	Non-daily Metered supply points are supply points taking less than 75,000 tpa where the meter is not read every day. This includes domestic consumers.
NEC	Network Emergency Co-ordinator.
NEMT	Network Emergency Management Team.
Network (Part of the gas supply chain)	A connected network of pipes used for the conveyance of gas from a gas processing facility, storage facility or an interconnector except those used exclusively for piping gas to non-domestic premises*. The network starts from a gas processing facility, storage facility or interconnector importing gas into Great Britain but does not include it**. The end of the Network is the outlet of the emergency control valve*** at the end of the service pipe. * GS(M)R Regulation 2(3). ** GS(M)R Guidance Notes Paragraph 10. *** As defined by GS(M)R Guidance Notes: Paragraph 2.
Uniform Network Code	A document which describes the commercial arrangements made between a GT and shippers for the operation of a pipeline system.
Network Entry Facility	A part of the network and may be a blending point* as defined by GS(M)R. * GS(M)R Guidance Notes: Paragraph 14.
Network Gas Supply Emergency	Any situation which has resulted in, or could result in, a loss of pressure to consumers which would require action to prevent one or more supply emergencies occurring, and where the loss of pressure occurred, or could occur, in the primary system, resulting in a loss of pressure in one or more secondary/supplementary systems.
Network Operations	Department within National Grid responsible for the duties of gas flow management in the primary system.
NGSEP	Network Gas Supply Emergency Procedure.
Notice of Direction	Issued by the Secretary of State under the Gas Act 1986 and 1995 directing a gas transporter to maintain supplies to a consumer.
NTS	The National Transmission System is the network of pipes, compressors and pressure reduction equipment that is part of the primary system.
Offtake	An installation through which a secondary system or large industrial consumer takes gas from the NTS.
Ofgem	Office for the Gas and Electricity Markets.

OCM	On the Day Commodity Market.
OM	Operating Margins.
1 in 20 Peak Day Demand	The peak day demand that, in a long series of winters, with connected load being held at the levels appropriate to the winter in question, would be exceeded in one out of twenty winters, each winter being counted only once.
Operational Balancing	The process of addressing any physical mismatch between supply and demand.
Operational Guidelines	A document which National Grid is required to establish in accordance with of its GT licence. Its purpose is to identify the various balancing measures available to National Grid and the basis on which National Grid must employ particular balancing measures during any day.
Primary System	The NTS, the associated network entry facilities and blending points.
Primary Transporter	Transporter of gas through the primary system.
Priority End User/Consumer	A customer type, such as hospitals, for whom the potential consequences of a loss of gas supply are such as to warrant priority status under government criteria.
Secondary System	Pipeline systems connected directly to the NTS.
Secondary Transporter	Transporter of gas through a secondary system.
Shipper	Holder of a licence authorising the person to arrange with any GT for the gas to be introduced into, conveyed by means of, or taken out of a pipeline system operated by that transporter. Shippers can buy gas from offshore or onshore gas production facilities, from storage facilities, under a trade at the beach, or within the system*. Also included as shippers are businesses which buy gas from producers for their own use, e.g. power generation companies. Shippers have a contract with the GT at each supply point which may be for continuous (firm) or discontinuous (interruptible) transportation. *At the national balancing point (NBP).
Supplementary System	Pipeline systems taking gas directly or indirectly* from a secondary system. *A supplementary system could take gas from another supplementary system.
Supplementary Transporter	Transporter of gas through a supplementary system.

Supplier	<p>Holder of a supplier's licence authorising that person to enter into contracts with industrial, commercial, or domestic consumers for the supply of gas.</p> <p>The contract may be for a firm supply or an interruptible supply. Suppliers have contracts with shippers but no direct contractual relationship with the GT.</p> <p>Any person only supplying gas to premises taking more than 2 million therms per annum (mtpa) does not need a supplier's licence.</p> <p>Suppliers have a direct relationship with individual gas consumers.</p>
Supply Emergency	<p>An emergency endangering persons and arising from a loss of pressure in a network or any part thereof.*</p> <p>*GS(M)R Regulation 2(1).</p>
System	<p>A discrete pipeline or a number of interconnected pipelines operated by one transporter and which can be considered to be independent of other systems for the purpose of firm load shedding.</p>
Terminal	<p>A gas processing facility* or a treatment point.**</p> <p>*GS(M)R Regulation 2(1).</p> <p>**GS(M)R Guidance Notes Paragraph 14.</p>
TPA	<p>Therms per annum.</p>
Trade	<p>An offer of flexibility between and amongst shippers and National Grid for their respective balancing purposes.</p>
Transmission System	<p>See primary system.</p>
Transportation capacity	<p>The maximum quantity of gas that can be delivered through the gas distribution network. This is dependant on demand and supply conditions, that may effect all or part of the network.</p>
Transportation Constraints	<p>Transportation constraints arise where the demand on the primary system or a part of the primary system exceeds the capability of the primary system to transport gas.</p>
Transporters	<p>Transporters own and operate pipeline systems which may supply domestic consumers.</p>
Treatment Point	<p>A point where out of specification gas is brought within the specification of GS(m)R Part I of Schedule 3 before it enters the network.</p>
VLDMC	<p>Very Large Daily Metered Consumer supply points are very large supply points taking more than 50 mtpa.</p>