Hazardous Installations Directorate
Gas & Pipelines Unit

Major Hazard Safety Performance Indicators in Great Britain's Onshore Gas and Pipelines Industry

Annual Report 2009/10

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Executive Summary

This report presents a broad range of safety performance indicators (SPIs) across Great Britain's gas transmission, distribution and other hazardous pipelines sectors. The Health and Safety Executive (HSE) publishes this report annually in order to monitor and compare the sector's safety performance year-on-year. Where necessary the Gas & Pipelines Unit incorporates the findings of this report into its operational strategy.

In 2009/10 the following improvements in the safety performance of Great Britain's gas and pipelines industry have been reported:

- There were no fatalities as a result of gas mains or service failures due to fractures or corrosion and there was only one mains and service related incident. This is the best performance in this area since 1991/92.
- Collectively the gas Distribution Network Operators' (DNOs') progress with the iron Mains Replacement Programme exceeded the approved target by 137 km
- The overall 12-hour gas escape prevention performance by the DNOs in response to public reported gas escapes has risen above 50%.
- The number of third party damage incidents reported across all the DNOs has fallen to 93, the lowest level since 2005.
- The number of events where the operating pressure on National Transmission System pipelines has risen above the maximum operating pressure (but by less than 2.5%) was at its lowest level since 2005.

The other key findings of this report are:

The Gas & Pipelines Unit recorded five Dangerous Occurrences (DOs) at its Control of Major Accident Hazard (COMAH) sites.

In 2009 there were eight incidents recorded in the most serious category in the UKOPA transmission pipeline infringement database report. No pipeline ruptures were reported.

1.0 Introduction

1.1 Safety Performance Indicators

Major incidents in the gas and pipelines industry occur infrequently and as such do not provide sufficient data with which to monitor the sector's safety performance. SPIs are used to monitor trends and provide assurance that the arrangements to minimise the risk of a major incident are effective. SPIs can be chosen from near-miss data such as low-level incidents or from precursors which might give rise to a major incident.

HSE's definition of a major incident and further information on HSE's response to such an event can be found at the following web-address:

http://www.hse.gov.uk/foi/internalops/og/ogprocedures/majorincident/

1.2 This Report

This annual report covers the period from 1 April to 31 March with the exception of SPI data provided by National Grid Gas plc for the National Transmission System (NTS) and pipeline data provided by UKOPA, which cover calendar years. The purpose of this report is to monitor and present a broad range of major hazard safety performance indicators across Great Britain's gas transmission, distribution and other hazardous pipelines sectors.

1.3 Great Britain's Gas and Pipelines Industry

The gas and pipelines industry in Great Britain operates both natural gas and other hazardous pipelines across the country. It also includes natural gas import and storage facilities. In Great Britain there are approximately 22,000 km of pipelines defined as Major Accident Hazard Pipelines (MAHPs) by the Pipelines Safety Regulations 1996. Approximately 21,000 km of these MAHPs transport natural gas at above 7 barg. The remainder transport ethylene and other dangerous fluids. In addition to the MAHPs, eight gas DNOs transport natural gas at pressures below 7 barg.

Prior to 1 June 2005, Transco plc operated nearly all of the natural gas MAHPs in the UK and owned all eight gas distribution networks (DNs). After 1 June 2005 four of the DNs were sold to Southern Gas Networks plc, Scotland Gas Networks plc, Wales & West Utilities Ltd and Northern Gas Networks Ltd respectively. National Grid Gas plc

retained DNs in London, the West Midlands, the East of England and the North West. National Grid Gas plc also retained the NTS which delivers high pressure gas throughout the country to each of the DNs and other direct off-takes such as power stations.

1.4 The Gas & Pipelines Unit

As a part of HSE the Gas and Pipelines Unit regulates health and safety in Great Britain's gas and pipelines industry. The focus of the Gas and Pipelines Unit's interventions are to improve health and safety outcomes in Great Britain through progressive improvements in the control of risks. This is achieved by ensuring that risks are properly controlled at onshore major hazards sites (including pipelines) and working with Offshore Division (OSD) to ensure the safety integrity of installations and associated pipelines. The Gas & Pipelines Unit contributes to OSD's targets by ensuring the integrity of emergency shutdown valves; pig traps; risers; pressure protection systems; sub-sea isolation valves; and wellhead pipework.

More information about the work of the Gas & Pipeline Unit can be found on HSE's website at:

http://www.hse.gov.uk/gas/supply/ and http://www.hse.gov.uk/pipelines/index.htm.

2.0 Gas and Pipelines Unit Safety Performance Indicators

2.1 Background

HSE is required by the Department of Work and Pensions (DWP) to monitor and set targets for the reduction of the number of DOs reported under the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) 1995 at onshore COMAH sites. These targets contribute to HSE's Major Hazards Strategic Programme and provide a good foundation for the Gas & Pipeline Unit's SPI report. However, DOs in the gas and pipelines sector occur in limited numbers and do not provide a sufficiently broad base against which to monitor the safety performance of the industry as a whole. As a result the Gas & Pipelines Unit has adopted an additional range of SPIs to reflect the principal risks in the sector. Some of the additional SPIs take account of recent changes to the gas distribution industry. The SPIs also include damage and loss data provided by UKOPA, as well as information which is required to be sent to HSE under the Gas Safety (Management) Regulations 1996 (GS(M)R) and the Iron Mains Replacement Programme (MRP).

HSE held extensive discussions with duty holders and other stakeholders in the gas and pipelines sector to ensure that the SPIs contained in this report are:

- Indicative of the principal risks generated and faced by the sector,
- Reasonably practicable for the dutyholders to produce, and
- If possible, use data already provided to other regulators, such as Ofgem.

2.2 Public Service Agreement Targets

HSE's Public Service Agreement target requires the Gas & Pipelines Unit to achieve a 47.5% reduction in the number of relevant DOs reported to it by 2011. Set against the 2001/2 baseline of 19 incidents the number of DOs reported to the Gas & Pipelines Unit should be reduced to 13 in 2009/10 and 10 in 2010/11.

The RIDDOR DO categories relevant to the Gas & Pipelines Unit are:

i. Electrical short circuit or overload;
ii. Pipelines or pipeline works;
iii. Explosion or fire;
iv. Escape of flammable substances;
v. Escape of substances.

2.3 Additional Safety Performance Indicators

Additional SPIs have been selected to be indicative of the sector's safety performance and relate to the potential occurrence of a major incident. They are:

i. The number of MAHP infringements caused by third parties and recorded by UKOPA in their Infringement Database report.
ii. The number of pipeline failure incidents arising from corrosion and other causes and reported by UKOPA in their Pipeline Fault Database report.
iii. Numbers of incidents on the NTS where:
    a. Terminal Flow Advice (TFA) has been issued to prevent off specification gas entering the NTS,
    b. Gas transmission pressure has risen above 102.5% of the pipeline maximum operating pressure,
    c. Off-take pressure has fallen below the 38-barg "drop-off" point.
iv. The number of GS(M)R reports submitted by gas DNOs.
v. Annual reports on progress with the MRP made by all five gas DNOs.

vi. Annual SPI reports made by all five gas DNOs. This includes:
   a. Total km of iron mains remaining in each DN,
   b. Number of Gas in Buildings (GIB) incidents,
   c. Number of mains and service related major incidents,
   d. Number of public reported escapes (PREs) requiring repair and prevented within 12 hours of the DNO being informed of the escape,
   e. Number of third party damage incidents to pipelines and mains.

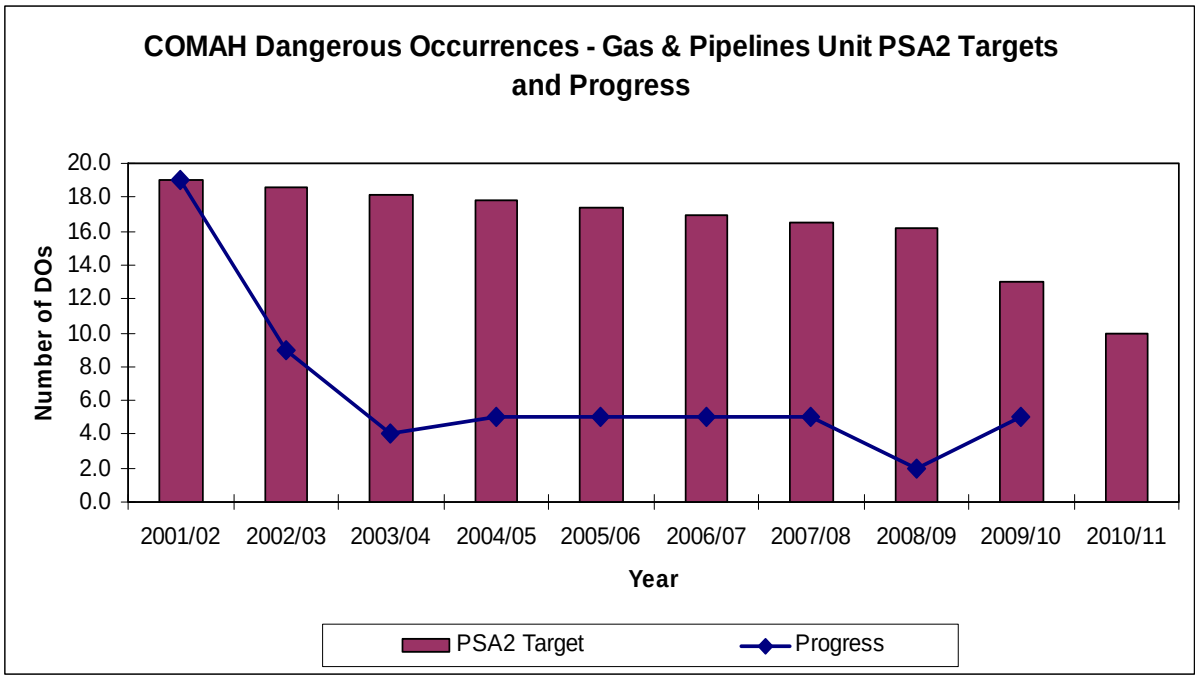
Note: These reporting categories are defined in Appendix 1.

3.0 Safety Performance in 2009/10

3.1 COMAH Site Dangerous Occurrences

In 2009/10 five DOs were reported to HSE's Gas & Pipelines Unit by upper COMAH site operators set against a target of 10. The graph below shows the Gas & Pipelines Unit's contribution to HSE's major hazard PSA2 target.

Graph 3.1.1: Contribution by Gas & Pipelines Unit to HSE's PSA2 Targets

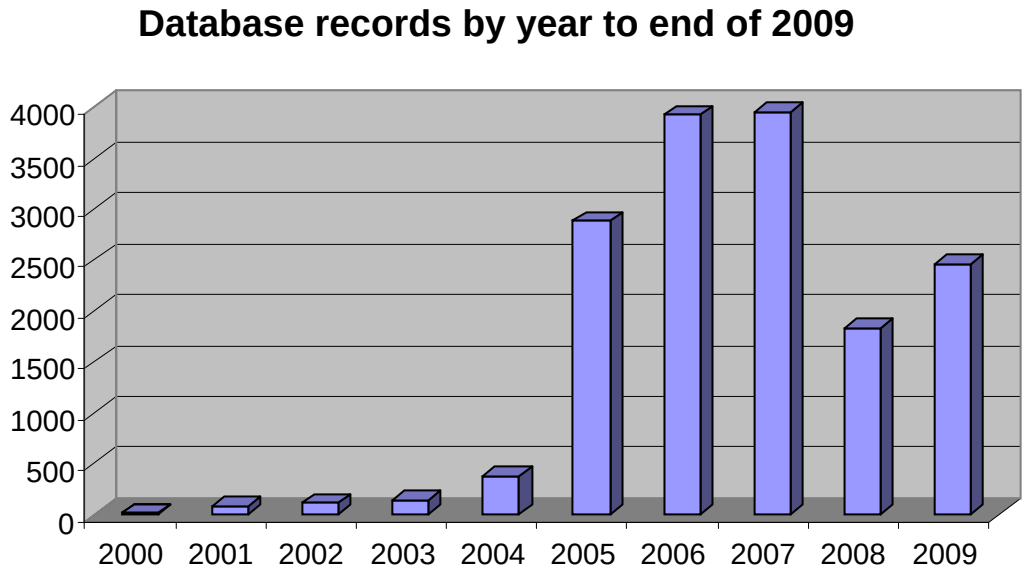


3.2 UKOPA Infringement Database

Third party infringement is one of the largest causes of transmission pipeline damage and rupture in the UK and abroad. An infringement is any activity that either causes damage to a pipeline or pipeline coating or may be a precursor to such damage. UKOPA collects data on infringements within the legal easement around a pipeline or in the pipeline operator's declared zone of interest and includes activities such as excavation; ditch digging; post-hole boring; directional drilling and earth movement or levelling activities in general. The UKOPA infringement database provides a framework for recording third party infringements and enables the collection of pipeline data on a national basis. The purpose of the database is to build on year-by-year data to identify trends in pipeline infringement and key factors leading to damage incidents. Not all of the data included in the UKOPA infringement database refers to MAHPs. However, all the transmission pipelines included in the infringement database have the potential to give rise to a major incident if ruptured.

The graph below shows the number of infringements recorded by UKOPA from 2000.

Graph 3.2.1: Infringements recorded on the UKOPA Database from 2000



The UKOPA infringement database report has been compiled annually from 2004. Prior to 2005 contributions to the database were from chemical and oil sector pipeline

operators only. With the addition of data from the high-pressure natural gas pipeline operators' data in 2005-07 the database content increased significantly.

The apparent fall in the number of reported infringements in 2008 is attributed by UKOPA to a re-assessment of raw pipeline infringement data supplied from the oil and gas pipeline operators. The rise in 2009 is attributed to improvements made in collecting data from all of the UKOPA members in that year.

The complete UKOPA reports can be found at on the UKOPA internet website at the following address: UKOPA :: ukopa excavation safety ::.

UKOPA categorises the third party infringement data it collects in order to create a more detailed picture of the severity of infringements around pipelines. Table 3.2.1 shows the categories used to describe actual damage or potential risk of damage to pipelines. Table 3.2.2 shows the categories used to describe the location of excavations in relation to a pipeline. Graph 3.2.2 shows the number of reported third party infringements by risk and location.

Table 3.2.1: UKOPA Infringement Risk Categories

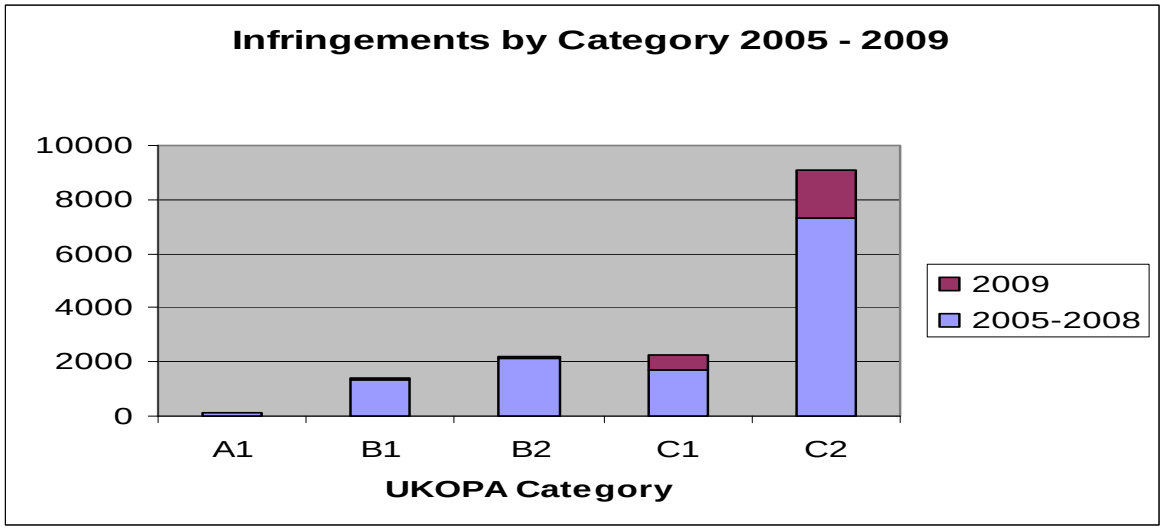
Risk	Infringement Type	Infringement Description
A	Pipeline Damage or Leak	Includes damage to wrap or protective sleeve
B	Serious Potential for Damage	Methods or equipment used could cause significant damage had excavation taken place
C	Limited Potential for Damage	Methods or equipment would not have resulted in serious damage

Table 3.2.2: UKOPA Infringement Location Categories

Location	Description
1	Within the pipeline wayleave or easement. Typically, this is the zone within which the pipeline operator has legal rights, including a requirement by the landowner to notify planned work.
2	Within the pipeline operators zone of interest, but outside the pipeline wayleave or easement. It is the area within which the operator would have reasonably expected a competent third party to have given notification in the prevailing circumstances.

The graph below shows the number of infringements subdivided by the infringement category.

Graph 3.2.2: Third Party Infringements by Location and Risk Category



In 2009, there were eight reported infringements in the highest category, A1, in which external damage was caused to UKOPA members' pipelines, There were no pipeline ruptures in 2009. Of the other infringement categories, C2 continues to make the largest contribution to the number of recorded infringements.

3.3 UKOPA Pipeline Fault Database

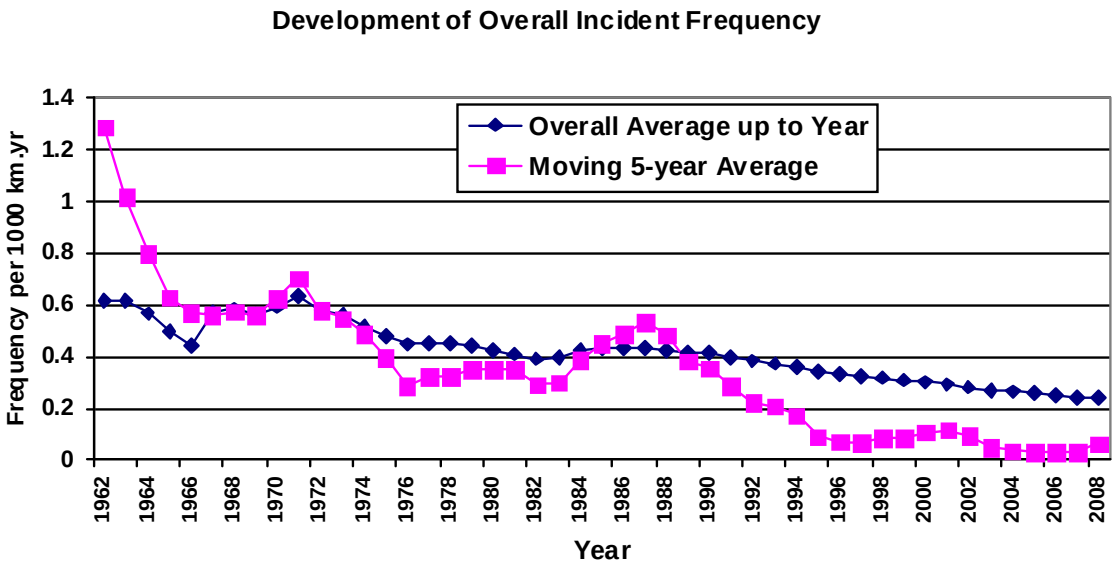
One of UKOPA's objectives is to develop a comprehensive view on risk assessment and risk criteria as they affect Land Use Planning aspects adjacent to high hazard pipelines. To help meet this objective UKOPA has compiled a pipeline fault database, the purpose of which is to:

- Estimate leak and pipeline rupture frequencies for UK pipelines, based directly on historical failure rate data for UK pipelines
- Provide the means to estimate failure rates for UK pipelines for risk assessment purposes based on analysis of damage data for UK pipelines
- Provide a more realistic and rigorous approach to design and routing
- Provide the means to test design intentions and determine the effect of engineering changes (e.g. wall thickness of pipe, depth of burial, diameter,

protection measures, inspection methods and frequencies, design factor etc.)

UKOPA define a product loss incident as an unintentional loss of product from the pipeline within the public domain and outside the fences of installations excluding associated equipment (e.g. valves, compressors).

Graph 3.3.1: UK Product Loss – Incident Frequency 1962 – 2008



In 2008 there were four pipeline product loss incidents. This compares to zero in 2007 and one in each year between 2004 and 2006. Whereas this has resulted in a small increase in the five-year average incident frequency the trend in the overall average incident frequency continues to be downwards. The next UKOPA pipeline fault report will be available in 2011 and the full 2008 report can be found at:

http://www.ukopa.co.uk/publications/pdf/UKOPA-07-0050.pdf.

3.4 Gas National Transmission System Gas Quality and Pressure Excursions

3.4.1 Gas Quality

National Grid Gas manages the quality of gas entering the NTS by issuing TFA communications to the Delivery Facility Operators (DFO). If the gas supplied to the

NTS by a DFO has the potential to fall below the standard required by GS(M)R, a TFA is issued requesting the DFO to reduce or cease supply.

In 2009 National Grid Gas issued 44 TFAs for the following reasons:

Table 3.4.1: Summary of TFAs issued for gas quality reasons

Gas Characteristic	**Number of TFAs Issued**				
	2005	**2006**	**2007**	**2008**	**2009**
Hydrocarbon Dewpoint	13	17	6	17	13
Hydrogen Sulphide	7	4	3	8	5
Carbon Dioxide *	3	4	0	0	0
Incomplete Combustion Factor	7	4	16	14	11
Wobbe Number	5	2	3	0	15
Calorific Value **	1	3	0	0	0
Water Dewpoint	1	2	3	1	0
TOTAL	**37**	**36**	**31**	**40**	**44**

* not required under GS(M)R Schedule 3.
** not required under GS(M)R Schedule 3 but used to calculate Wobbe Number.

The overall number of TFAs issued by National Grid Gas between 2005 and 2009 has not varied significantly, with an annual mean 38. However, in 2009 there has been a sharp increase in the number of TFAs issued for Wobbe Number excursion.

3.4.2 Pipeline Maximum Operating Pressure (MOP)

The Institution of Gas Engineers and Managers 'Recommendations on Transmission and Distribution Practice for Steel Pipeline for High Pressure Gas Transmission', (IGE/TD/1) states "The sustained operating pressure for a pipeline system should not exceed Maximum Operating Pressure (MOP)". However, the sustained operating pressure is the maximum set pressure for the pressure regulating devices, and when operating at or near the MOP, this pressure may be exceed by no more than 2.5% of its value due to the variations of pressure regulating devices and instruments. IGE/TD/1 Edition 4 also allows for an incidental pressure rise, above MOP plus 2.5%, provided the pressure does not reach the Maximum Incidental Pressure (MIP) of the pipeline. The MIP described in IGE/TD/1 Edition 4 is 10% above the MOP. When an event of this nature occurs it should not last for more than 5 hours in excess of MOP at any one time or for more than 20 hours per year.

The table below shows the number of events where pipeline pressure has risen above the MOP and how many pipelines were affected.

Table 3.4.2: Summary of Pipeline MOP Events

Operating Pressure Level	**Number of Events/ Number of Pipelines Affected**				
	2005	**2006**	**2007**	**2008**	**2009**
Operating Pressure reached MIP	0/0	0/0	0/0	0/0	0/0
Operating Pressure exceeded MOP+2.5% for no more than 5 hours	1/3	0/0	0/0	0/0	0/0
Operating Pressure exceeds MOP but was less than MOP+2.5%	9/15	29/46	7/10	4/5	3/3

Note: This data does not include any events where instruments have been identified as faulty or where the pipeline pressure was increased to facilitate a planned operation for testing prior to up-rating a pipeline.

In 2006 the number of events where the operating pressure on NTS pipelines rose above the MOP but by less than 2.5% was significantly higher than in other years. In 2007 National Grid Gas put in place a process to monitor and review all MOP excursion events so that appropriate action is taken when such events occur. Since 2007, the number of events where the operating pressure on NTS pipelines rose above the MOP but by less than 2.5% has continued to decrease.

3.4.3 Distribution Network Entry Pressure

National Grid Gas monitors the pressure at the inlet to Distribution Network Offtakes to ensure it does not fall below the recognised normal design operating pressure of 38 barg. There was one such event in 2009. This did not lead to any failures to supply at the Offtakes.

Table 3.4.3: Number of incidents where DN inlet pressure fell below 38 barg

Number of DN Offtake Incidents	**2005**	**2006**	**2007**	**2008**	**2009**
	1	0	3	2	1

3.5 Gas Safety (Management) Regulations 1996 Reports

Gas Conveyors have a duty under Regulation 7(13) of GS(M)R to investigate and report certain gas escapes that occur on their networks, i.e. those escapes that have, or are likely to have resulted in a fire or explosion. The investigation should be carried out to establish the source of the escape and, so far as is reasonably practicable, the reason for it. The criteria used by gas conveyors to decide whether to make a GS(M)R report are where the following have occurred:

i. A GIB event where the gas concentration has exceeded 20% of the Lower Explosive Limit (LEL) or where more than 10kg has been released, or,
ii. An external release exceeding 500kg, or,
iii. An escape of gas, either within a building or on a network, which has resulted in a fire or explosion.

The GSMR report data for 2009/10 is currently unavailable.

3.6 Iron Mains Replacement Programme

In September 2001 HSE published its enforcement policy for the replacement of iron gas mains for the 30-year period 2002-2032. This followed concern about the potential consequences of gas mains failure. At that time records showed there were about 91,000km of iron mains within 30m of property, although in 2004 this was revised to 101,000km. Since June 2005 the responsibility for meeting the requirements of the MRP has belonged to all five DNOs.

Graph 3.6.1: Profile for the decommissioning of iron gas mains from 2002 to 2032

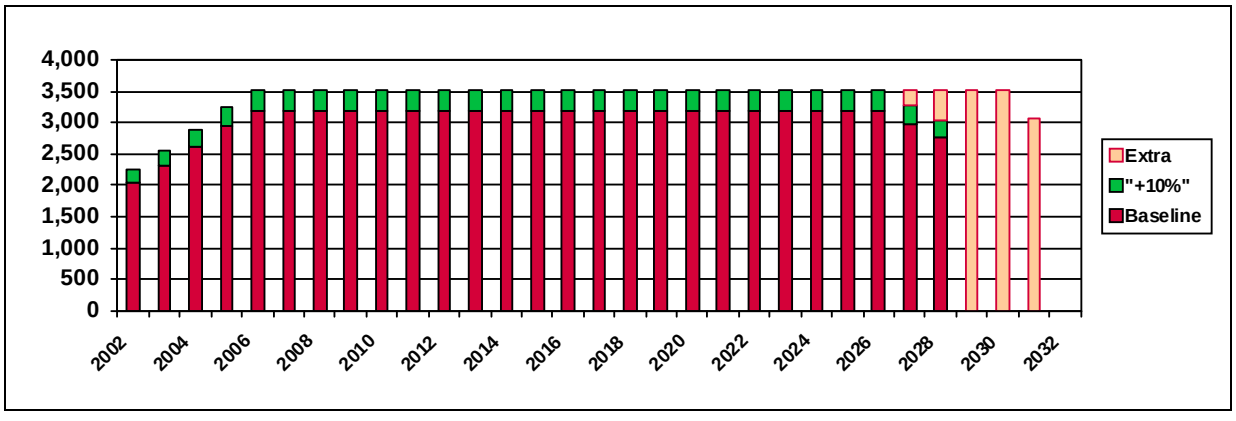


Table 3.6.1 below shows the 30/30 iron mains decommissioning performance from 1 January 2002. The iron mains decommissioned during the period 1 January 2002 to 31 May 2005 were under Transco plc ownership and afterwards were under the ownership of five gas DNOs.

Table 3.6.1: Mains Decommissioning Performance from January 2002

30/30 iron mains decommissioned (km)	**Jan 02 - March 03**	**03/04**	**04/05**	**05/06**	**06/07**	**07/08**	**08/09**	**09/10**
Baseline + 10%	2575	2549	2882	3286	3514	3600	3678	3728
Actual	2846	2673	2847	3287	3562	3639	3819	3865
Variance	271	124	-35	1	48	39	141	137

Table 3.6.2: DNOs' Mains Decommissioning Performance in 2009/10

Gas Distribution Network	**Baseline + 10% target (km)**	**Actual (km)**	**Variance (km)**
National Grid Gas plc – North West	544.0	541.0	-3.0
National Grid Gas plc – East of England	601.0	626.0	25.0
National Grid Gas plc – West Midlands	347.0	380.0	33.0
National Grid Gas plc – London	364.0	384.0	20.0
(National Grid Gas plc – Total)	*1856.0*	*1931.0*	*75.0*
Northern Gas Networks Ltd	528.1	534.8	6.7
Scotland Gas Networks plc	271.0	281.6	10.6
Southern Gas Networks plc	712.3	748.8	36.5
(Scotia Gas Networks – Total)	*983.3*	*1030.4*	*47.1*
Wales & West Utilities Ltd	361.0	369.3	8.3
Total of all Distribution Networks	**3728.4**	**3865.5**	**137.1**

In 2009/10 the mains decommissioning performance for the combined gas distribution networks exceeded the national target by 137.1 km (3.7%). Of the

101,000 km of ‘at risk’ iron mains identified in 2004, 26,539 km have now been decommissioned. This is 727 km ahead of target.

Further information on the Iron Mains Replacement Programme can be found on HSE’s Gas Industry website at the following address:
http://www.hse.gov.uk/gas/supply/mainsreplacement/irongasmain.htm

3.7 Gas Distribution Network Reports

Full definitions for the terms and reporting categories used in this section of the report are given in Appendix 1.

3.7.1 Iron Mains Remaining

The table below shows the length of all iron mains remaining within each DN, (regardless of proximity to an occupied building) on 31 March for the year reported.

Table 3.7.1: Total Iron Mains Remaining in each gas DN from 2006

Gas Distribution Network	**2006 (km)**	**2007 (km)**	**2008 (km)**	**2009 (km)**	**2010 (km)**
National Grid Gas plc – North West	13,241	12,681	12,208	11,567	11,047
National Grid Gas plc – East of England	17,000	16,363	15,772	15,086	14,405
National Grid Gas plc – West Midlands	10,337	9,890	9,534	9,141	8,785
National Grid Gas plc – London	10,713	10,400	10,102	9,739	9,391
(National Grid Gas plc – Total)	*51,291*	*49,334*	*47,616*	*45,533*	*43,628*
Northern Gas Networks Ltd	14,571	14,085	13,603	12,907	12,355
Scotland Gas Networks plc	7,599	7,238	6,934	6,608	6,291
Southern Gas Networks plc	19,695	18,941	18,297	17,601	16,867
(Scotia Gas Networks - Total)	*27,294*	*26,179*	*25,231*	*24,209*	*23,158*
Wales & West Utilities Ltd	10,471	10,174	9,805	9,381	8,977
Total of all Distribution Networks	**103,627**	**99,772**	**96,255**	**92,030**	**88,118**
(Mains removed since previous year)		3,855	3,517	4,225	3,912

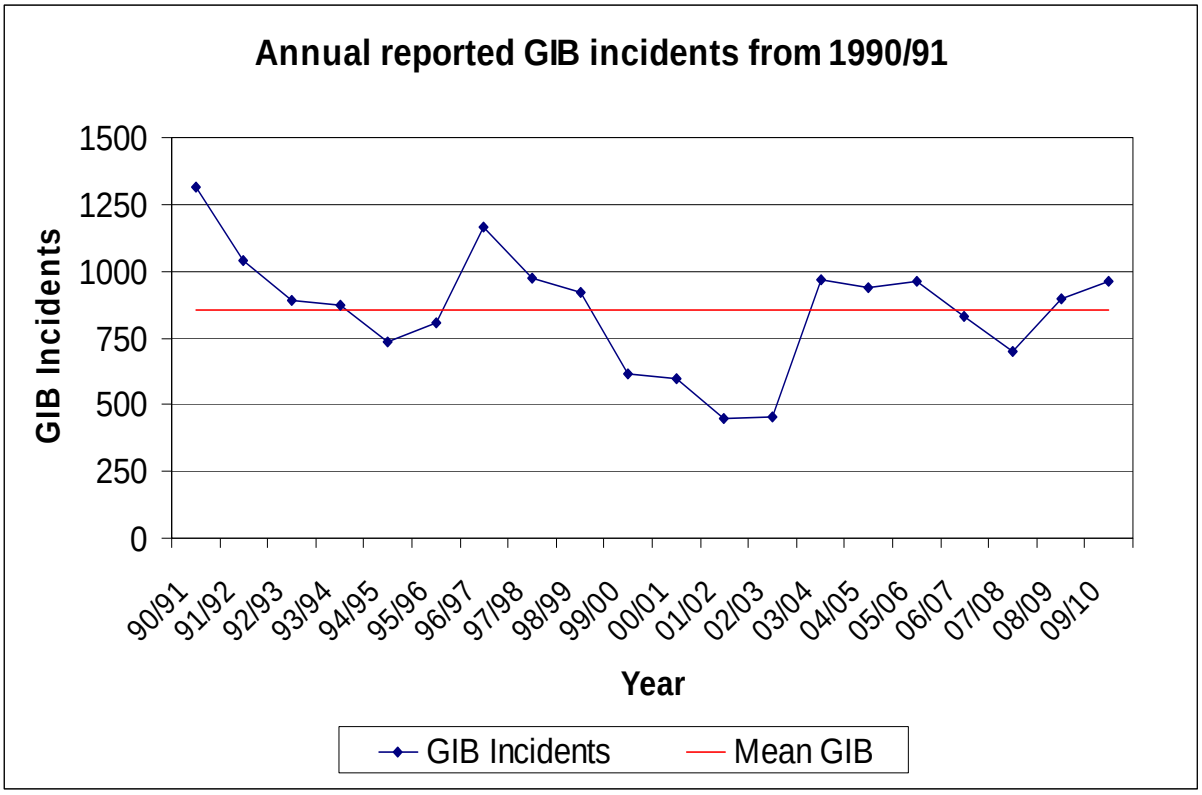
This table shows the gradual decrease in total length of all iron mains across all DNs and includes iron mains decommissioned as part of the MRP as well as those removed due their condition or as part of other network maintenance or upgrading.

3.7.2 Gas in Buildings Incidents

A GIB incident occurs when gas escaping from an outside gas main enters a building. Further information on how this is categorised is provided in Appendix 1.

The graph below shows the annual number of GIB incidents which have occurred since 1991/92. The mean value for the same period is also shown.

Graph 3.7.2: Annual reported GIB incidents from 1990/91



The significant increase in reported GIB incidents which occurred during 2003 has been attributed to data capture improvements and does not indicate general system deterioration.

The mean number of incidents since 1990/91 is 855. In 2009/10 the number of GIB incidents increased from 897 to 963, an increase of 66 incidents or 7%. However, this is not significantly above the mean value.

The table below shows the number of GIB incidents reported annually by each gas DNO since 2005/06. A year-on-year comparison can be made for the same DN. However, since each DN is comprised of varying mixtures of urban and rural pipelines it is not possible to compare fairly the GIB performance of the different DNs on the basis of the length of mains they operate.

Table 3.7.2: Number of GIB incidents across the gas DNs

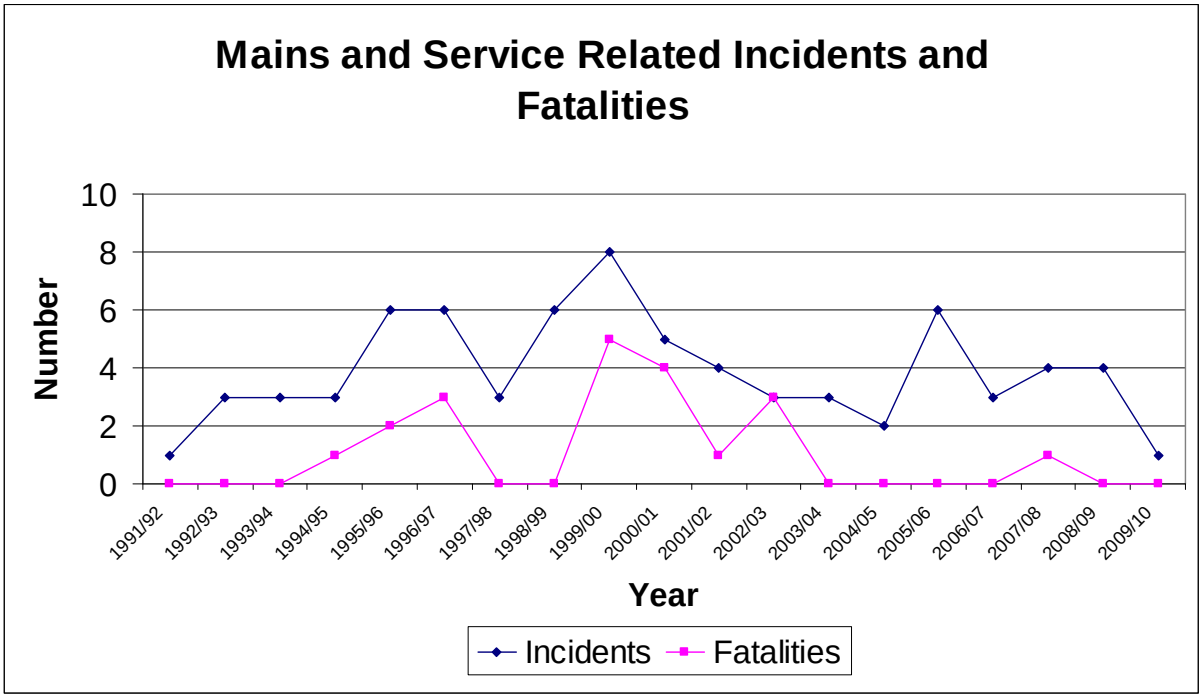
Gas Distribution Network	**05/06**	**06/07**	**07/08**	**08/09**	**09/10**
National Grid Gas plc – North West	143	104	96	150	184
National Grid Gas plc – East of England	198	149	133	215	183
National Grid Gas plc – West Midlands	68	97	72	115	138
National Grid Gas plc – London	56	72	53	73	72
(National Grid Gas plc – Total)	*465*	*422*	*354*	*553*	*577*
Northern Gas Networks Ltd	207	173	97	90	120
Scotland Gas Networks plc	67	62	67	54	86
Southern Gas Networks plc	105	99	121	127	108
(Scotia Gas Networks - Total)	*172*	*161*	*188*	*181*	*194*
Wales & West Utilities Ltd	119	74	61	73	72
Total of all Distribution Networks	**963**	**830**	**700**	**897**	**963**

Numbers highlighted in green indicate a decrease from the previous year. Numbers highlighted in amber indicate an increase on the previous year and numbers highlighted in red indicate a sequential increase over the previous two years.

3.7.3 Number of Mains and Service Related Major Incidents

The graph below shows the numbers of mains and service related incidents across all of the gas DNs which caused death, major injury or significant structural damage from 1 April 1990 onwards.

Graph 3.7.3: Number of Mains and Service Related Major Incidents and Resulting Fatalities from April 1990



In 2009/10 there was a single mains and service related incident and no fatalities.

In the 12 years prior to the start of the iron mains replacement programme in 2002, there were, on average, 4.58 mains and service related incidents per year and 1.42 fatalities per year.

Since the start of the iron mains replacement programme in 2002 there have been, on average, 3.25 mains and service related incidents per year and 0.5 fatalities per year.

3.7.4 Public Reported Escapes Requiring Repair Prevented within 12 Hours

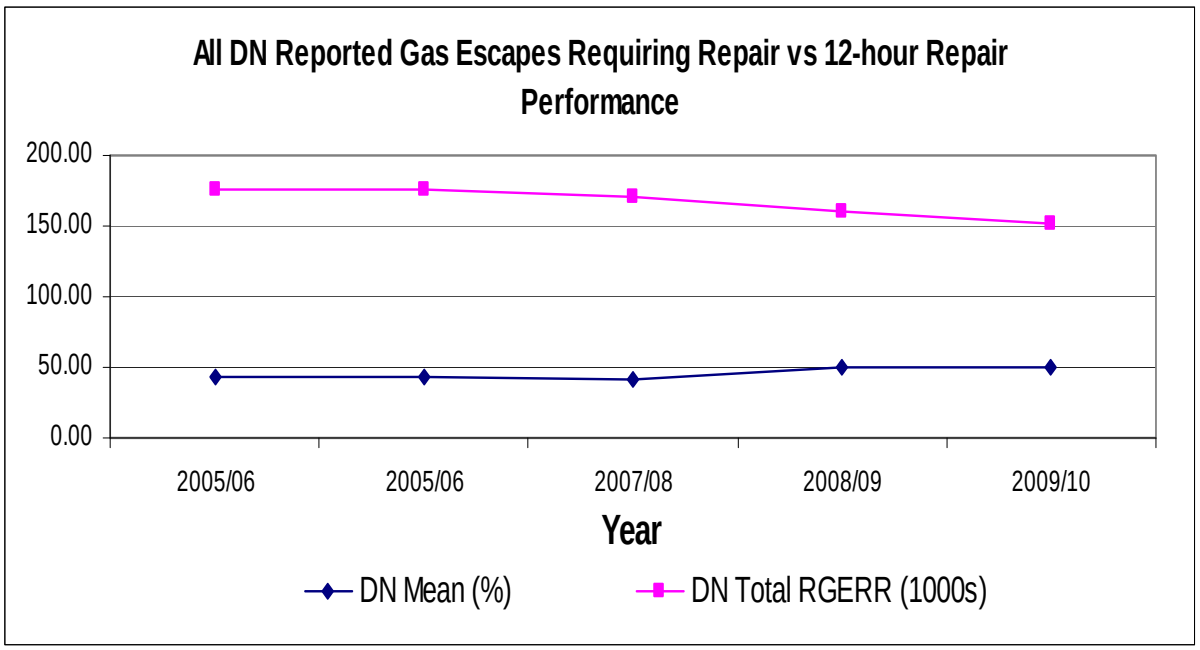
When a member of the public makes an emergency call to report a gas escape the relevant gas DNO records a Public Reported Escape or PRE. The DNO then dispatches a First Call Operative (FCO) to investigate any potential leak. If the FCO finds a gas escape from a main, service or Emergency Control Valve (ECV) then a reported gas escape requiring repair will be logged by the DNO.

Each DNO has to comply with regulation 7(4) of GS(M)R. This requires that after a PRE has been reported any gas leak should be attended as soon as is reasonably practicable and prevented within 12 hours of being informed of the escape unless it is not reasonably practicable to do so. Occasionally no trace of escaping gas is found and sometimes a number of PREs are found to relate to a single gas leak. The PRE repair performance of each DNO is therefore based only on those gas escapes requiring repair. In this context repair means:

i) a permanent repair,
ii) a temporary repair where the gas escape has been prevented,
iii) isolation of the gas supply.

The graphs and table below show the number of reported gas escapes requiring repair and the 12-hour repair performance of each DNO as well as a summary of performance across all of the DNs. The 12-hour repair performance is given as a percentage of the number of reported gas escapes requiring repair.

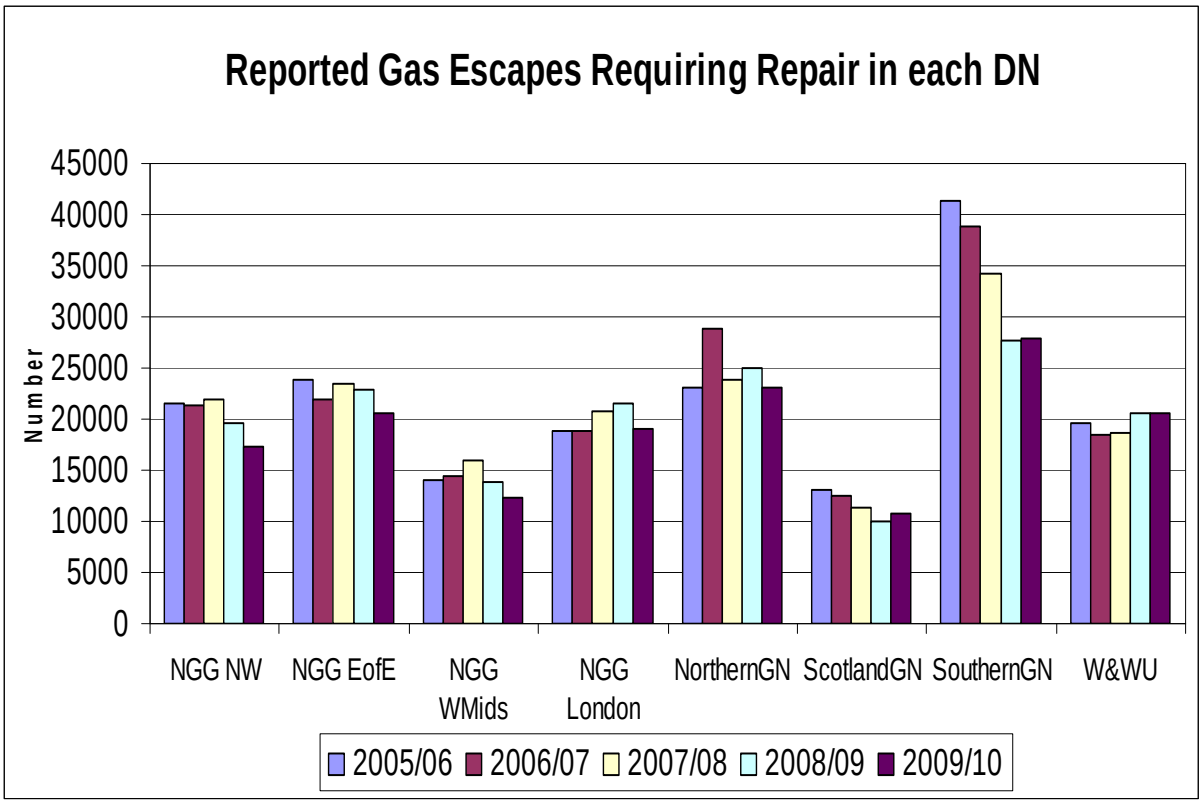
Graph 3.7.4.3: DN Mean 12-hour repair performance and DN total Reported Gas Escapes Requiring Repair from 1 April 2005



Between 2005/06 and 2009/10 the percentage of reported gas escapes requiring repair across the gas DNs and prevented within 12 hours has increased from 43.8% to 50.1%. Over the same period, the number of reported gas escapes requiring repair across the DNs has fallen from 175,295 to 151,668, a decrease of 13%.

The graph below shows annual number of reported gas escapes requiring repair received by each DNO since 2005/06. The DN operated by Southern Gas Networks shows the most marked reduction in the numbers of reported gas escapes requiring repair.

Graph 3.7.4.2: Number of Reported Gas Escapes Requiring Repair in the gas DNs from April 2005

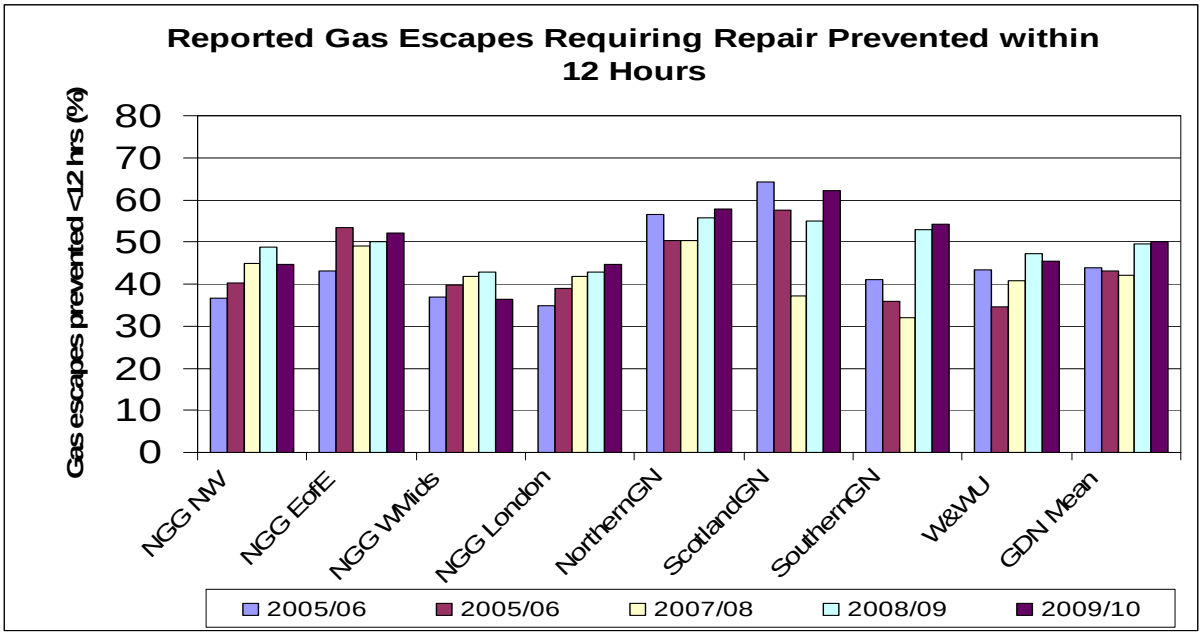


The table below shows the 12-hour repair performance of each DNO as a percentage of the reported gas escapes requiring repair received by each DNO since 2005/06. The following graph also illustrates this.

Table 3.7.4.1: Percentage of Reported Gas Escapes Requiring Repair prevented within 12 hours of receipt of a PRE in the gas DNs from 1 April 2005

Gas Distribution Network	**05/06 (%)**	**06/07 (%)**	**07/08 (%)**	**08/09 (%)**	**09/10 (%)**
National Grid Gas plc – North West	36.7	40.3	44.9	48.7	44.8
National Grid Gas plc – East of England	43.2	53.4	49.0	50.1	52.2
National Grid Gas plc – West Midlands	37.0	39.8	41.9	42.7	36.4
National Grid Gas plc – London	34.8	38.9	41.8	42.9	44.6
(National Grid Gas plc – Total)	*38.3*	*43.6*	*44.7*	*46.4*	*45.4*
Northern Gas Networks Ltd	56.5	50.3	50.4	55.6	57.9
Scotland Gas Networks plc	64.3	57.6	37.3	54.9	62.3
Southern Gas Networks plc	41.0	35.9	31.9	53.0	54.1
(Scotia Gas Networks - Total)	*46.6*	*41.2*	*33.2*	*54.0*	*58.2*
Wales & West Utilities Ltd	43.4	34.5	40.7	47.2	45.4
Mean of all Distribution Networks	**43.8**	**43.0**	**42.0**	**49.6**	**50.1**

Graph 3.7.4.3: Percentage of Reported Gas Escapes Requiring Repair prevented within 12 hours of receipt of a PRE in the gas DNs from April 2005



In 2009/10 the majority of DNOs have reported an improvement in their 12-hour gas escape prevention performance. However, the results for Wales & West Utilities and two of the DNs operated by National Grid Gas have been affected by the introduction of new, risk-prioritised systems, which have, in some cases, redirected resources towards higher risk gas escapes that have taken longer than 12 hours to prevent. Scotia Gas Networks and Northern Gas Networks are in the process of introducing similar risk-prioritised gas escape prevention systems in their DNs.

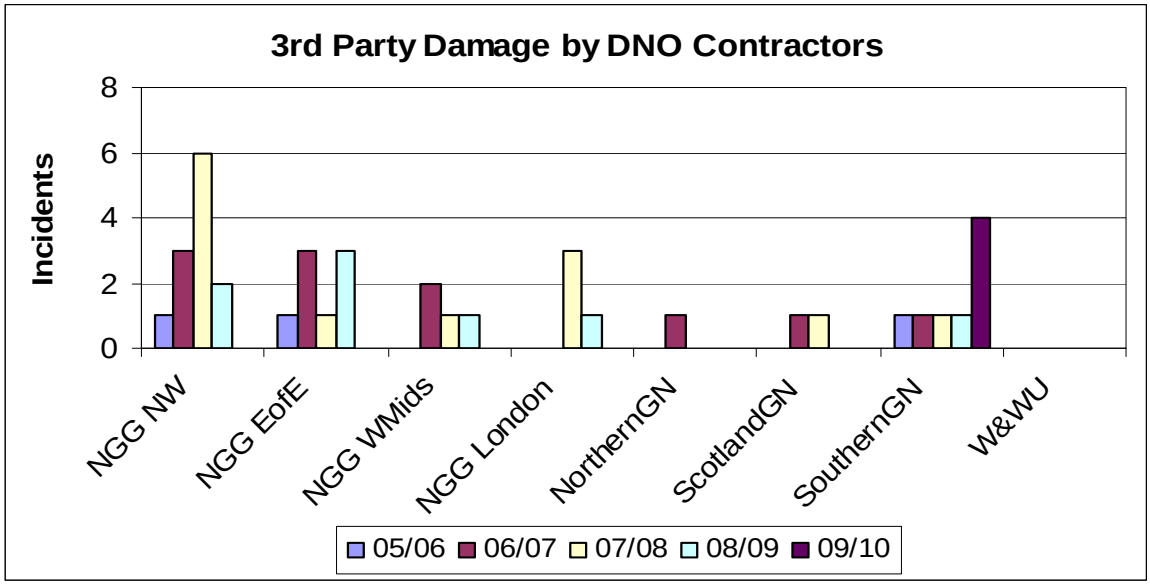
3.7.5 Third Party Damage Incidents

The table and graphs below show the number incidents of third party damage to distribution mains in each gas DN. The data is further broken down by whether or not the damage was caused by a contractor working for the gas DNO.

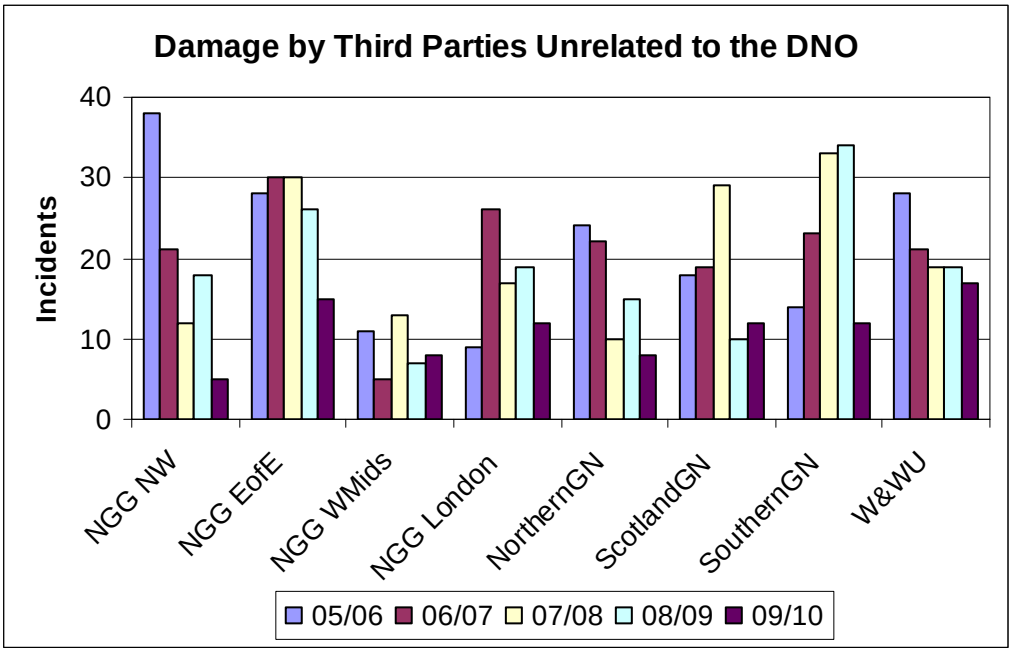
Table 3.7.5.1: Total number of third party damage incidents across all DNs from 1 April 2005

Number of incidents	**05/06**	**06/07**	**07/08**	**08/09**	**09/10**
	173	178	176	156	93

Graph 3.7.5.1: Number of third party damage incidents caused by contractors working for the gas DNOs from 1 April 2005



Graph 3.7.5.2: Number of damage incidents caused by third parties unrelated to the gas DNOs from 1 April 2005



The total number of third party damage incidents reported by all the DNOs has fallen significantly from 156 in 08/09 to 93 in 09/10.

In 2009/10 four third party damage incidents were caused by the gas DNOs' own contractors whilst, Wales & West Utilities continues to have no incidents in this category. The overall figure remains small compared to the damage caused by unrelated third parties, which in 2009/10 amounted to 89 incidents.

4.0 Summary of Results

This is the fifth year that the Gas & Pipelines Unit has reported SPIs in Great Britain's gas and pipeline industry. The report does not provide an absolute assessment of the state of the industry's major hazard safety performance although the data collected so far may allow for some limited identification of trends.

In 2009/10 improvements in safety performance have occurred in:

- The number of mains and service related incidents and fatalities
- The length of iron mains decommissioned by the gas DNOs
- The overall 12-hour gas escape prevention performance by the DNOs in response to emergency calls from the public
- The number of third party damage incidents reported across all DNs
- The operating pressure levels on the National Transmission System

A more detailed summary is given below.

Public Sector Targets

In 2009/10 the Gas & Pipelines Unit recorded five DOs at COMAH sites. This contribution to HSE's Public Service Agreement has exceeded the Unit's target of a 47.5% reduction in the number of relevant DOs reported to it by 2011 set against the 2001/2 baseline.

UKOPA Databases

i. UKOPA Pipeline Infringement Database

In 2009 there was an apparent decrease in the total number of all categories of pipeline infringement reported in the UKOPA infringement database report. However this has been attributed to a re-assessment of the incident data reported by the contributing pipeline operators.

In 2009 there were eight incidents recorded in the most serious infringement category although no pipeline ruptures resulted.

ii. UKOPA Pipeline Fault Database

In 2008 four pipeline product loss incidents were reported in the UKOPA pipeline fault database report. Although this is an increase in the number of incidents in recent years the overall incident frequency trend is not significantly affected and remains downwards.

This UKOPA report will be next updated in 2011.

National Transmission System

Overall the safety performance indicators reported by the gas NTS operated by

National Grid Gas have not changed significantly between 2005 and 2009.

In 2009 the number of events where the operating pressure on NTS pipelines rose above the MOP but by less than 2.5% was at its lowest level since 2005. However, there has been a sharp increase in the number of TFAs issued for Wobbe Number excursions.

Gas Safety (Management) Regulations Reports

Pending a review of HSE's GSMR database and internal handling processes for GSMR reports the data for 2009/10 is currently unavailable.

Iron Mains Replacement Programme

The Mains Replacement Programme performance in 2009/10 was again above target across all DNOs with the total length of iron mains decommissioned exceeding the approved target by 137 km.

Iron Mains Remaining

The lengths of all iron mains operated by the gas DNOs has continued to fall due to the Mains Replacement Programme and additional decommissioning works.

Gas in Buildings Incidents

In 2009/10 the number of GIB incidents reported by the gas DNOs increased to 963. This is not significantly above the 1990/91 to 2009/10 mean of 855 incidents per year.

Mains and Service Related Incidents

In 2009/10 there were no fatalities as a result of gas mains or service failures due to fractures or corrosion. Overall, there was one mains and service related incident. This is the best industry performance in this area since 1991/92.

Public Reported Escapes

Between 2005/06 and 2009/10 the percentage of reported gas escapes requiring repair across all of the gas DNs and repaired within 12 hours has risen from 43.8% to 50.1%. Over the same period, the number of reported gas escapes requiring repair

across the DNs has decreased by 13%.

National Grid Gas and Wales & West Utilities have both introduced risk-prioritised gas escape prevention systems in their DNs. Scotia Gas Networks and Northern Gas Networks are in the process introducing similar systems across their DNs.

Third Party Damage

Between 2005/06 and 2009/10 the total number of third party damage incidents across all of the gas DNs has decreased from 173 to 93, with the most significant reduction occurring in the last year.

The number of third party damage incidents caused by the gas DNOs' own contractors has remained small compared to the damage caused by unrelated third parties. Wales & West Utilities have reported no contractor third party damage since the start of this report.

Appendix 1 - DNO Annual SPI Reporting Definitions

IRON MAINS REMAINING

DNOs report the total iron mains population (in km) for each network regardless of proximity to a building.

This information should be useful in allowing HSE to compare safety performance across each DN. However, since the ratio of the ± 30m populations will vary across DNs, this will not provide the basis for a precise measure of residual risk.

GAS IN BUILDINGS

DNOs report the number of 'Gas in Buildings' (GIB) events where any gas readings have been detected within a building as a result of an iron distribution mains pipe failure, specifically:

i. A fracture or corrosion of a cast/spun iron main
ii. Corrosion of a ductile iron main

Reportable GIB events will exclude incidents arising from:

iii. Non-iron materials (polyethylene, steel, etc)
iv. Non-pipe specific components (e.g. joints, clamps, encapsulations, internal appliances, etc.)
v. Services
vi. Other failure causes such as third party interference

Note: To be consistent with the data already reported to Ofgem, GIB events will be reported regardless of the LEL concentration level.

MAINS & SERVICE RELATED INCIDENTS

DNOs report the number of failures upstream of the ECV leading to gas entering a building, where subsequent ignition causes death, major injury (as defined by RIDDOR 1995) or significant structural damage. This category covers only those incidents arising from mains fractures and corrosion and does not include third party damage.

Note: National Grid Gas has previously defined significant structure damage where

the estimated cost of repair is in excess of £10,000. Incidents not meeting this criterion but where the concentration of gas is ≥20% LEL inside buildings (when evacuation is required) or where 500kg has been released externally will continue to be reported under RIDDOR and GS(M)R.

PUBLIC REPORTED ESCAPES

a) DNOs report the number of 'reported gas escapes requiring repair' made on their Networks instead of the number of 'Escapes on the Network'. The reason for this is to remove any inflation of numbers caused by multiple 0800 111 999 calls. This also removes any need for the DNOs to report on "No Trace" incidents.

A 'reported gas escape requiring repair' is a repair made to a distribution mains or service pipe following a gas escape. This includes Third Party Damage and excludes leaks and repairs downstream of the ECV. In this context repair means:

i. a permanent repair
ii. a temporary repair where the gas escape has been prevented
iii. isolation of the gas supply

b) DNOs report the number of escapes on their Networks prevented by a within 12 hours from receipt of the first emergency call.

Note: Since this data will be extracted from the emergency call centers it may include situations where multiple calls have been received for a single gas escape.

5. THIRD PARTY DAMAGE

DNOs report the number of third party damage incidents on their Networks. In this case, "Third Party" excludes the DNO's own employees but includes the DNO's contractors and any other unrelated parties. Only the following categories will be reported:

a) Incidents on mains operating below 7 barg, and
b) Incidents where a report of a dangerous occurrence has (or should) have been made under RIDDOR Schedule 2, paragraph 14, parts (a), (b) and (c), specifically where, using GS(M)R criteria:

i. Damage resulting in a GIB event where > 20% LEL gas in air concentration or

>10Kg gas escape has occurred,

ii. Damage resulting in an external release > 500Kg,

iii. Damage and release leading to the ignition of gas.

Note: The DNO should follow a gas measurement procedure which provides the best indication of the risk of ignition in GIB events where > 20% LEL concentration or >10Kg has occurred.

DNOs also categorise the number of incidents in two ways, these being:

c) Incidents caused by the DNO's own contractors

d) Incidents caused by unrelated parties.