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TECHNICAL ASSOCIATION
OF THE EUROPEAN NATURAL GAS INDUSTRY

Report on European Gas Safety, Gas Distribution (EGAS B) (2006 to 2015)

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1 Summary

Safety of gas distribution infrastructure in Europe is subject to a continuous surveillance towards improvement, even if its records are good ones. Accident statistics show that the accident rate in the distribution sector is very low, i.e. less than 0,5 fatalities per year and per 100.000 km of distribution network length. Furthermore statistics reveal a clear downward trend in number of injuries and number of fatalities over the past years.

2 Introduction

Utilisation of large quantities of natural gas in industry as well as in commercial, domestic and traffic applications is ranked as very safe among industry experts.

Nevertheless the public awareness and the media are more focused on spectacular accidents than on safety records or statistical values. But rational discussion about safety and risk in the gas installations is only possible if it is based on unbiased facts and figures.

Furthermore the gas industry itself wants to show its safety record and wants to identify its own weak points to be able to allow for risk-oriented improvements.

Therefore, in 1995 nine major gas companies and national industry associations began to gather data on gas-related accidents in their countries. Collection of data, exchange of views and development of improving measures was formalised by setting up the ETPS (European Third Party Safety) group.

In 2005 this ETPS group joined Marcogaz to allow for a broader data base in new European countries and above all to allow for a better communication of the safety performance of the European natural gas industry.

In 2008 Marcogaz, taking into account the unbundling of companies, decided to split ETPS into two specific groups, ensuring thus a more accurate and reliable data collection:

- "Gas Distribution" under the designation EGAS B,
- "Gas Installation" under the designation EGAS C.

This report gives an overview on the EGAS Distribution data base and on the main analyses and results in a statistical way, shown in tables and different graphs. Some conclusions at the end aim at easier understanding of the statistical findings. The accident parameters represent a set of safety performance indicators used in the European Natural Gas Industry.

3 EGAS B Data Base and Definitions

Period:	2006 – 2015
Participating countries:	6 – 14
Included number of customers (average):	64.553.800
Included length of mains (average):	1.026.540 km

Contributing countries from 2006 to 2015:

- Austria
- Belgium
- Czech Republic
- Denmark
- Finland
- France
- Germany
- Greece
- Ireland
- Italy
- The Netherlands
- Norway
- Portugal
- Romania
- Slovakia
- Spain
- Switzerland
- United Kingdom

Table 1 EGAS B data base general information

year	2006	2007	2008	2009	2010
number of accidents	36	52	65	53	33
mains length (km)	1.179.540	931.480	932.850	1.043.485	751.150
number of customers	78.987.230	62.923.460	65.099.870	65.522.850	39.191.360
participating countries	6	6	10	8	7
year	**2011**	**2012**	**2013**	**2014**	**2015**
number of accidents	70	51	7	16	22
mains length (km)	1.457.670	1.253.255	1.082.130	1.186.190	1.026.530
number of customers	93.204.200	63.428.550	60.584.700	64.292.300	53.017.140
participating countries	12	14	13	14	11

Table 2 Basic data from 2006 to 2015

Accident - An unintentional event, related to natural gas, which has caused physical injuries or fatalities or big material damage

Fatality - Death, as a consequence of a natural gas accident; immediately or within 30 days of the event.

Injury - Injury, as a consequence of a natural gas incident that needs a hospitalization of at least one night.

Substantial Material Damage - any damage greater than 100,000€, e.g. to houses, cars, excavators etc, except damage on the gas distribution system itself.

Note: data of fatalities and injuries of internal personal/contractors are excluded

Distribution Network - Is defined by the following parts under responsibility of the Distribution System Operator (DSO):

- distribution mains
- service lines (piping, valve, regulator, (usually) meter)
- pressure regulating stations

Table 3 Definitions for the EGAS B data base

4 Analysis and Results

4.1 Evolution of Accidents

In figure 1 the evolution of accidents for the years 2006 to 2015 is given related to a distribution network length of 100.000 kilometres. The range varies from 0.62 to nearly 7 accidents per 100.000 kilometres.

This broad variation is surely due to the number of participating countries in this period which ranges from 6 to 14 countries (see table 2).

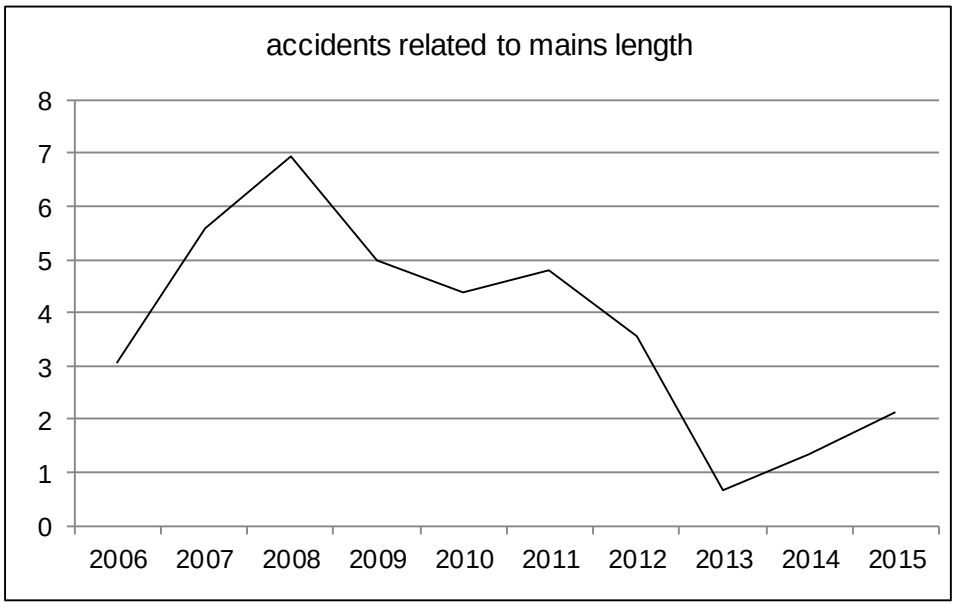

Figure 1 – Number of Accidents related to the length of main lines (by 10^5 km)

Up to the year 2009 the statistical tables are stating the number of accidents with injuries and the number of accidents with fatalities.
Beginning with the year 2010 the data collection was changed to the number of injured people and to the number of fatalities caused by accidents instead of the number of accidents with injuries and fatalities respectively.

In order to give an overview for the period 2006 to 2009 over the accidents with injuries figure 2.1 is presented, the number of accidents with fatalities is given in figure 3.1.

In figure 2.1 the evolution of accidents with injured people is indicated related to 100.000 kilometres of distribution network length. The range varies from 3 to 3,9 accidents with injuries per 100.000 kilometres.

Figure 2.2 is giving the number of individuals injured by accidents related to 100.000 kilometres of distribution network length. Due to the small amount of values, a resilient statement regarding the development is not possible.

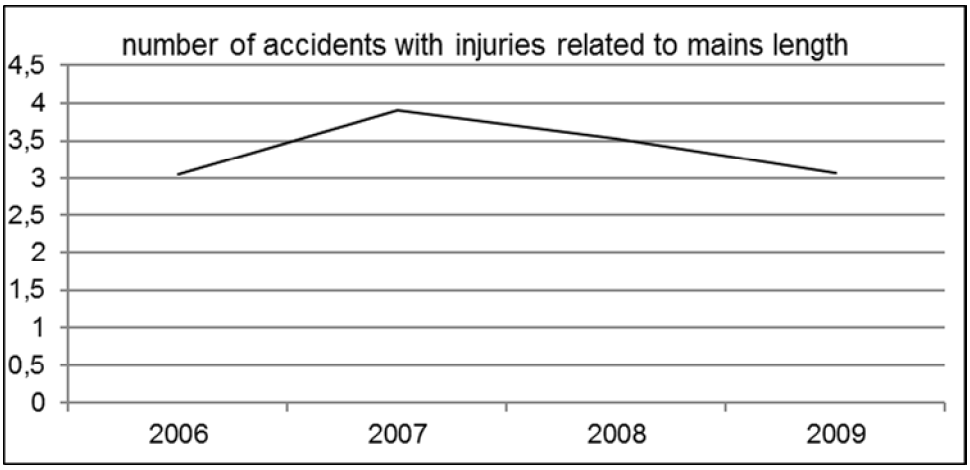

Figure 2.1 – Number of accidents with injuries related to the length of mains (by 10^5 km)

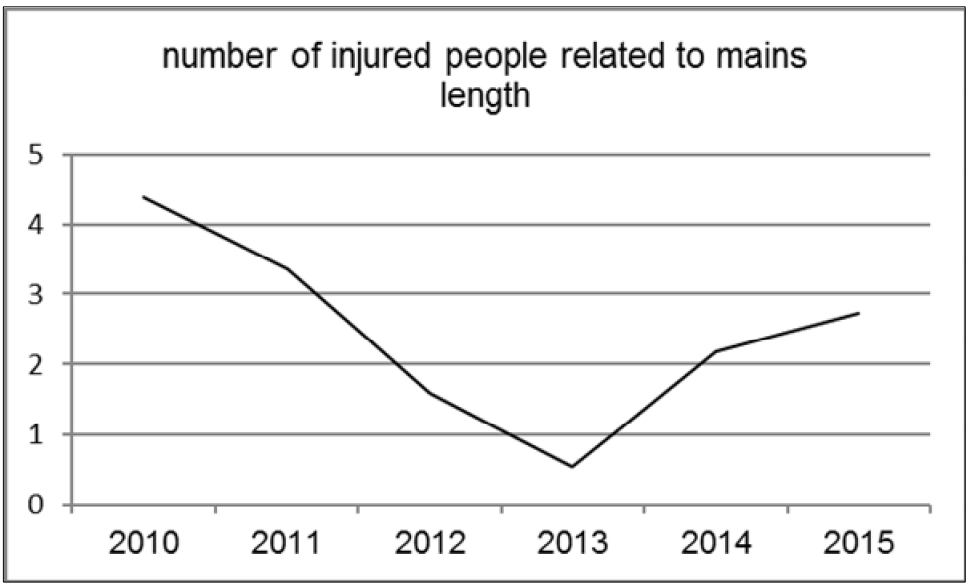

Figure 2.2 – Number of injured people related to the length of mains (by 10^5 km)

In figure 3.1 the evolution of accidents with fatalities is indicated related to 100.000 kilometres of distribution network length. The range varies from 0,5 to 0,08 accidents with fatalities per 100.000 kilometres.

Figure 3.2 is giving the number of fatalities caused by accidents related to 100.000 kilometres of distribution network length. Due to the small amount of values, a resilient statement regarding the statistical trend is not possible.

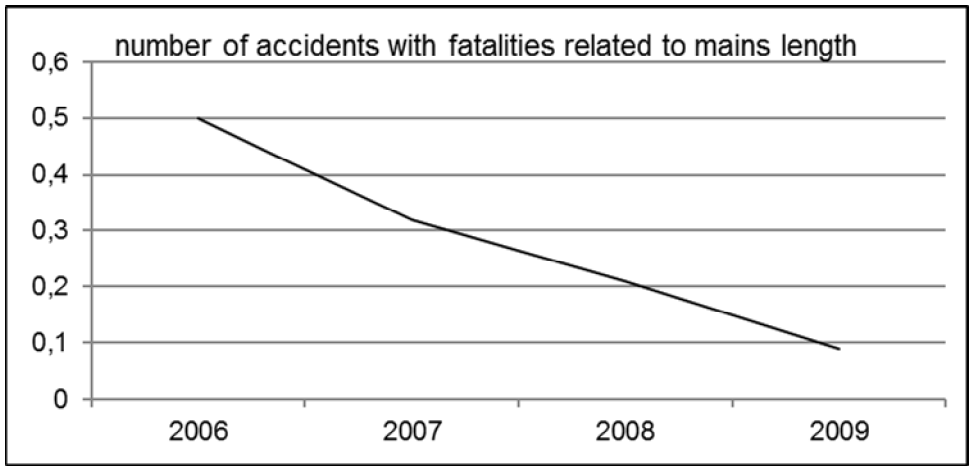

Figure 3.1 – Number of accidents with fatalities related to the length of mains (by 10^5 km)

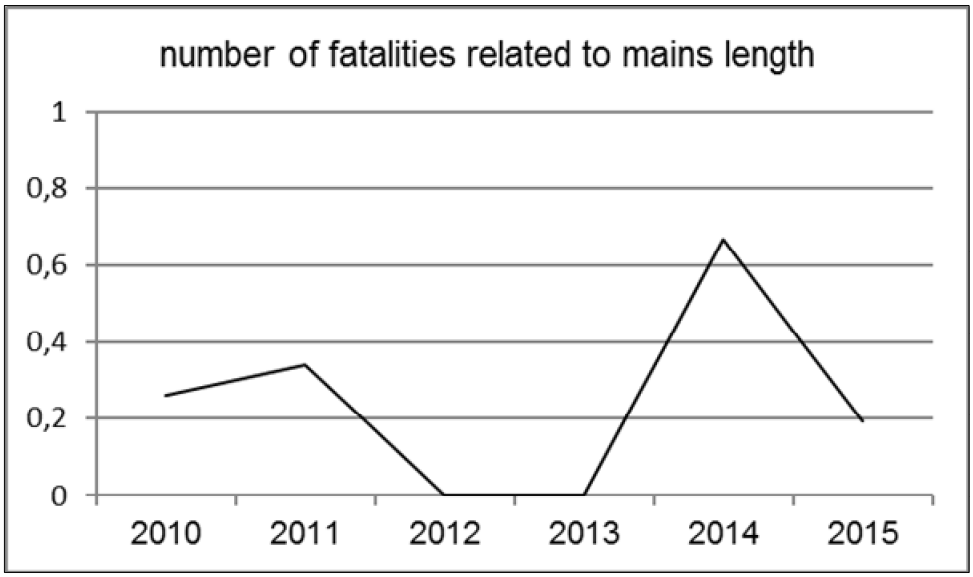

Figure 3.2 – Number fatalities related to the length of mains (by 10^5 km)

4.2 Causes of accidents

In 2007 EGAS B started collecting data with a new more detailed form asking now also for causes of accidents in distribution networks.

The following causes for accidents are listed:

- third party damage (TPD)
- ground movement due to e.g. settlement
- activities of workers (own staff or contractor) or operators error
- component or construction defects
- corrosion or aging
- vandalism or theft
- others e.g. impact by defect of electrical cable

In figure 4 an overview over the annual reported causes of accidents for the years 2007 to 2015 is given.

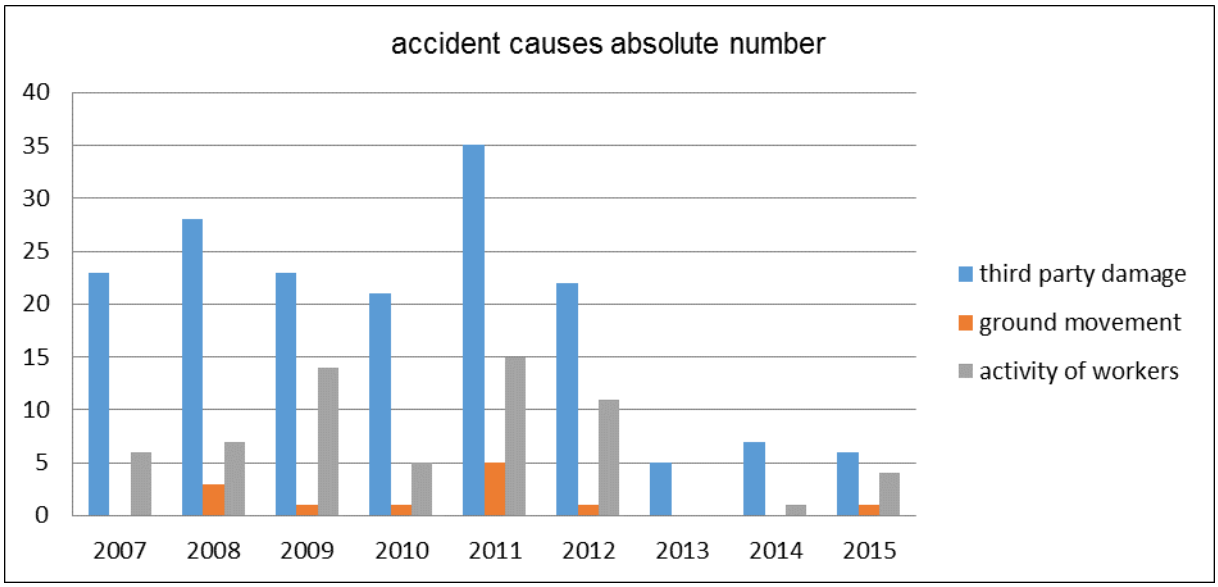

Figure 4 – Annual reported causes of accidents

There is a clear indication that the two main causes for accidents are

- Third Party damage and
- Activities of workers.

In figure 5 the main accident causes are given in relation to 100.000 kilometres length of distribution network.
The development over the years (2007 to 2015) can be considered as on a relatively constant low level.

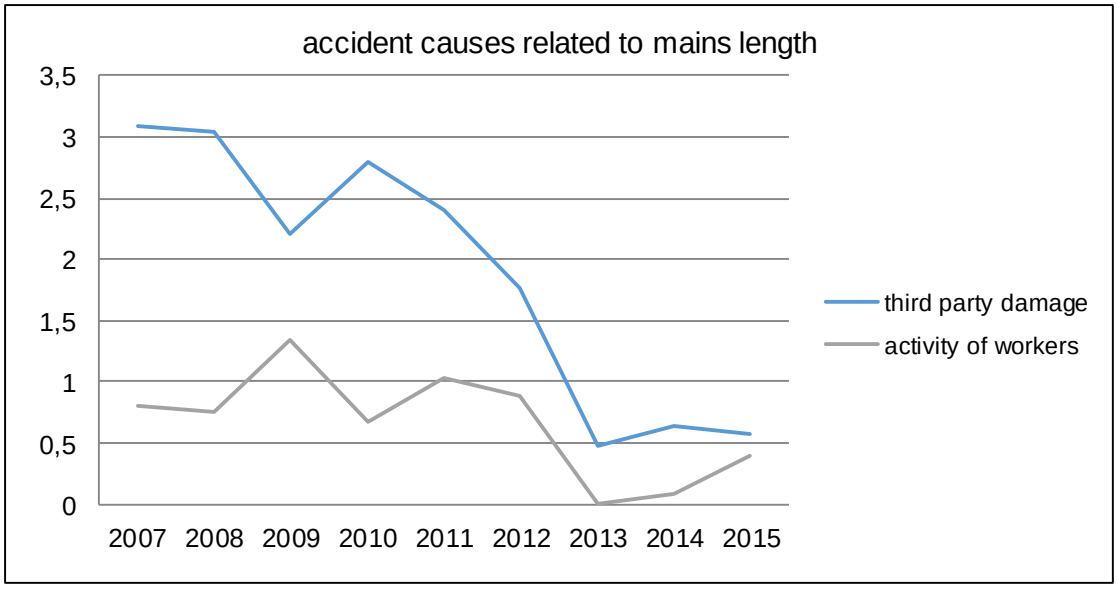

Figure 5 – Main causes of accidents related to the length of mains (by 10^5 km)

5 Conclusions

a) The EGAS B data base proves clearly its statistical representativeness in the field of the European distribution networks, based on up to sixteen countries and on more than 66 million gas customers;

b) The number of fatalities on the gas distribution system caused by accidents is very low with an average frequency of 0,24 per 100.000 km of length of mains (see figure 3.2);

c) The number of fatalities commensurate with the millions of customers has been maintained at a low level over the last years;

d) The ratio of number of accidents to the length of the distribution network is quite low and demonstrates the high level of safety. The presented figures show that third party damage is the main cause of the accidents. The European Gas Industry is aware of this fact. As a result to reduce the third party damage, e.g. special trainings of operators of construction machinery are offered or one call systems are developed;

e) Although the European Gas Industry can display excellent Safety Performance Indicators in the field of gas distribution, it will keep up maintaining and improving technical measures towards a safety level as high as possible.

NOTE
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