



Gasunie & Safety



gasunie
crossing borders in energy

Foreword

Gasunie is a European gas infrastructure company. We are responsible for the transmission of natural gas and green gas in the Netherlands and northern Germany.

To get the gas to customers safely and reliably, we have a high-grade gas transmission grid. Our staff and those of our contractors comply with the strictest safety standards while working. We work in a safe and appropriate manner, causing the least possible harm to people, the environment, and the area around our infrastructure.

We aim to:

- ▶ prevent accidents, serious incidents and damage to pressurised systems (such as pipelines)
- ▶ reduce the environmental impact of our commercial activity
- ▶ contribute to sustainable energy supply

Gasunie has been transporting natural gas safely and reliably since 1963. You and we have become so familiar with this that you might almost forget that it does not happen by itself. Our staff work 24/7 to ensure that gas continues to flow safely and that it is available on demand. Safety is not self-evident; we must always strive to do our best. And we do. Our motto is 'Think Safety'.



This publication gives you an insight into how we deal with safety within our company. We discuss the importance of safety, examine the safety policy in general and look at four specific areas in more detail: safety at the workplace, external safety, process safety and technical safety.

We can look back on an outstanding performance over the past 50 years, thanks partly to our strict safety policy. We are doing all we can to ensure that this good performance carries on into the future, because gas and the gas infrastructure will remain important even in a sustainable future. Gas is the cleanest fossil fuel, with flexible use options, and the range of gas-related products is growing all the time. Natural gas is complemented by other forms of gas such as green gas, biogas and hydrogen. In short: the gas infrastructure will continue to play an important role in our society and economy. The same applies to the safe and reliable transmission of gas irrespective of the source. Because safety will always be Gasunie's top priority.

Groningen, December 2013

Geert Graaf

Acting CEO N.V. Nederlandse Gasunie

In brief

Gasunie has taken safety very seriously ever since its foundation in 1963. We have acted to ensure that natural gas transmission is always safe and reliable. We also think that it is important that everyone working for Gasunie has safe working conditions. This is why we monitor and control the most important work processes, use comprehensive technical standards and have procedures to ensure that everyone always knows what he or she has to do. Some of the safety rules are so crucial that they are incorporated into the Gasunie Golden Rules of Safety. These apply to anyone working for us.

Changes to the energy world

The world in which Gasunie operates is changing all the time: national borders become European borders, companies enter into joint ventures, new parties come into the market while others disappear. Gasunie itself is also present on the international scene. We are a leading European gas infrastructure company and own gas transmission networks in the Netherlands and Germany. We also offer other services that our customers need, such as gas storage and LNG (Liquefied Natural Gas).



Government role

The Dutch State is Gasunie's only shareholder, and so is closely involved in the company's policy. There are also close contacts with the government in other areas, such as legislation, regulations and supervision. The government wants to know about our processes and how we have developed our HSE policy. It also assesses external safety risks on the basis of specified standard calculations, and monitors safety at the workplace. Broadly, Gasunie's entire asset management system, from staff training through to incident recording, is closely followed by various authorities.

Both the shareholder and the Authority for Consumers & Markets (ACM) supervise Gasunie's organisational structure and its cost accounting.

Key issues over the next few years

Gasunie is involved with internal and external developments, leading to some changes in emphasis with regard to safety.

Parts of Gasunie's transmission system are starting to show their age, and so it is becoming increasingly important to keep a close eye on the condition of pipelines and installations. This is why we are launching renovation programmes, such as the current programmes for the regional gas transmission network (Gasunie Network Improvement Programme) and the main gas transmission network (Rotating Equipment Optimization Programme). These programmes entail the modification, and where necessary replacement, of installations and stations in our gas transmission network. This will enable us to continue carrying gas safely and reliably in the future, while meeting environmental requirements.





Gasunie has been in existence for over 50 years. The gas network in the Netherlands has grown constantly over that time. It is important to keep knowledge of the network over the years up to date and to incorporate this knowledge into new information systems. We want to have the latest data on the quality and quantity of our transmission system (the assets) available at all times. This (detailed) information about our assets is constantly being improved, adjusted to reflect the requirements that the government imposes, and made accessible by bundling it for the whole of the transmission system. Government attention, which is sometimes translated into regulation on the basis of this kind of information, is increasing. This will be reflected in the context of the introduction of standardised asset management systems (incorporated into NTA 8120) and is already taken into account in the regulated part of Gasunie (Gasunie Transport Services B.V.). Standardised asset management systems promote the transparency and accessibility of information and processes.

The gas sector has a number of high standards specific to the sector, which are at least as stringent as legislation and regulations. We are investing at international level in knowledge to develop new standards. As understanding changes over time, and legislation is revised to reflect this, we map and update the safety risks of both existing and new pipelines and installations. A risk-based approach allows us to set priorities to achieve (continuous) improvement. For example, ground cover above pipelines is not the same everywhere. It can also change over time, particularly if earth-moving activities are carried out. The distance between our pipelines and other objects, such as a planned residential area, is also subject to change. At one moment a pipeline can be in an empty field, but the next moment it can be hemmed in by new roads and homes as a result of rezoning. We monitor these developments and alter the gas transmission network accordingly if necessary.

Among other things, our procedures ensure that at Gasunie we operate safely. Both internal processes (such as reorganisations) and increasing attention on the part of the authorities mean that we need a clear asset management system with well-defined quality indicators to produce accurate management information.

The government assesses the external safety risks associated with the transmission of natural gas on the basis of risk analyses. The results of the analyses are checked against standards. This means that a representative calculation



method is vital for all our systems. This topic therefore requires permanent attention and close cooperation between the government, which sets down the rules, and Gasunie, which has knowledge and experience of the gas transmission network.

We are expected to continue to strive for the most efficient management of the gas transmission network. The challenge is to do this more intelligently, at lower cost, while maintaining or if possible improving safety.

Gasunie takes internal and external safety communication very seriously because of the potential risks to people and the environment posed by the transport of large volumes of gas under high pressure. The purpose of communication is to promote the safety culture within the company, to keep the public informed, and to give a clear picture of our safety policy in contacts with authorities and social groups.



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Organisation and policy

Gasunie's Executive Board is responsible for corporate safety policy, with the assistance of the HSE department. The various units flesh out the safety policy on the basis of corporate principles, and the HSE department can give advice and verify unit policies. This department has a number of safety experts, each of whom specialises in a particular field. They are managed from the HSE department, but some of them work on an embedded basis on the line. Operational departments also have their own staff with specific HSE tasks.

Gasunie also has an HSE Support Team that acts as an additional sounding board for new safety policy, and ensures that feedback from the field is reflected in the policy.

- ▶ Gasunie's aim is to avoid incidents, but they can never be completely ruled out. We can however learn from incidents. Gasunie operates a comprehensive form of incident registration. Where necessary, an in-depth investigation (such as TRIPOD) is carried out to ascertain the causes and take appropriate action. Incident statistics are recorded to detect possible connections and trends so that any similar incidents can be anticipated. Management holds regular meetings to discuss what can be learned from incidents and to keep the organisation tightly focused;
- ▶ Attention to safety also takes the form of an HSE website which contains information on several subjects with which our employees and employees of third parties working for us may have to deal. The Golden Rules of Safety are prominently displayed on the website. These rules are also displayed on special notice boards at Gasunie locations.



Four areas of the safety policy

Our safety policy covers the following areas:

- ▶ safety at the workplace
- ▶ external safety
- ▶ process safety
- ▶ technical safety

What does safety mean in each of these areas?

- ▶ Safety at the workplace: having a safe workplace and working safely in order to guarantee the health and safety of our own employees and contract staff.
- ▶ External safety: a safe situation for people working, living or spending leisure time close to our installations and pipelines.
- ▶ Process safety: safe design, safe management - i.e. regular maintenance - and safe use of the infrastructure so as to prevent accidents that might involve the discharge of a hazardous substance.
- ▶ Technical safety: safe design and construction of the infrastructure throughout its life and under all conditions.





These safety areas are interconnected.

Safety at the workplace and external safety are the aspects of safety which are most visible to the government and society. Process safety and technical safety are important to Gasunie to guarantee safety at the workplace and external safety. The technical integrity of the gas transmission network (technical safety) is after all a key determining factor in the prevention of incidents. This also applies to working with and on gas-carrying systems under high pressure (process safety). For this reason, Gasunie regards process safety and technical safety as important, if not critical, conditions for the more high-profile areas of safety at the workplace and external safety.

Gasunie draws a distinction between process safety and technical safety, although the industry in general only uses the term 'process safety'. We deliberately draw this distinction so as to focus attention on process safety from the point of view of the person/machine relationship. The purely technical side of process safety has always been among our core activities in the field of safety.

Legislation and regulations

Safety legislation and regulations are quite complex and contain many specific terms and abbreviations. But we pay considerable attention to them because Gasunie regards it as very important to at least comply with legislation and regulations.

The PBZO (Major Accidents Prevention Policy) document sets out Gasunie's policy for installations that are covered by the BRZO (Major Accidents (Risks) Decree) and other regulations. In this context, the installations have to have a safety management system (NTA 8620). The testing framework for external safety is described in the BEVI (Decree on the External Safety of Facilities). A similar testing framework was introduced on 1 January 2011 for pipelines: BEVB (Decree on the External Safety of Pipelines). This also contains a description of an asset management system for pipelines (NTA 8000). Our largest installations are known as BRZO facilities. Installations of a given size and with given pipeline situations are subject to the QRA obligation (quantitative risk analysis), which is used to test the situation against the risk standards that apply in the Netherlands.

Gasunie has also decided to operate in accordance with the environmental management system ISO 14001, NTA 8120 and ISO 17020. Gasunie's definitive asset management system is therefore the integrated outcome of NTA 8620, NTA 8000, NTA 8120, ISO 14001 and ISO 17020. Regular internal and external audits are conducted to confirm that we are working according to these asset management systems.





Safety at the workplace

The working conditions at Gasunie protect the health and safety of employees and third parties while they are working. We also operate according to the Golden Rules of Safety. These are not a new set of procedures or rules, but are the translation of Gasunie's HSE policy and Code of Conduct into specific rules for our conduct and our attitude to working safely. In general we regard the safety culture and safe behaviour as very important. A key principle in everything we do is not to make any assumptions but always to check whether we can work safely in a given situation. It is crucial that we have well-trained staff who are alert to safety so that Gasunie can work safely.

Gasunie's safety objective is to prevent all incidents. This is reflected in a comprehensive package of operational safety measures. We strive for continuous improvement when implementing the safety policy. In accordance with health and safety legislation, Gasunie follows the state of the art when developing its safety policy. We also make use of lessons learned: we learn from our mistakes, and adapt our policy in the light of these mistakes if necessary.



For contract staff too

Contractors working for Gasunie are subject to the same standards as our own staff. All work must be done in a safe, environmentally responsible way. Contractors, sub-contractors and their employees must be familiar with and work according to Gasunie's Health, Safety and the Environment policy.

Reporting incidents

Accidents, incidents, environmental problems and hazardous situations that occur on Gasunie premises or land must be reported by Gasunie employees or contractors.

The aim of internal and external notifications, investigations, reports and records of these events, which can affect both safety and the environment, is to learn from them and prevent recurrence in the future.

Risk analyses

The safety at the workplace policy follows the legislation and regulations introduced by the Ministry of Social Affairs and Employment. Occupational risks at Gasunie are inventoried and described in a company-wide Risk Inventory and Evaluation (RIE) document, along with the action taken. Major occupational risks are described separately in an ARIE, which is a report required under the BRZO (Major Accidents (Risks) Decree).

As risk can never be entirely ruled out when work is being done, it is important that (residual) safety risks are assessed correctly. Various methods are available for this type of risk assessment or risk analysis. Gasunie uses risk matrices that have been developed internally to assess risks to safety at the workplace and external safety risks. The government also requires this type of risk matrix to be used as a form of summary reporting of risks and safety policy (in the PBZO, NTA 8620 and NTA 8000 referred to above).

Gasunie uses these kinds of matrices for many processes. The first step in risk assessment is to estimate the possible consequences of a scenario and then estimate or calculate its frequency or likelihood. Then the relevant risk can be determined in the matrix. The matrix also shows which risks receive particular attention.

01R



01R

Personal protective equipment

Gasunie does all it can to make work as safe as possible. However, risks cannot always be ruled out. Both Gasunie employees and contract staff are required to use personal protective equipment (such as work clothing, shoes, helmets, goggles and gloves) in order to avoid injury as much as possible. Personal protective equipment has to meet high standards, which is why it is sufficiently comfortable and offers the right protection. Wearing work clothing also means that people are more easily seen at the workplace. Agreements on how work is to be done are contained in Gasunie standards and manuals. Work permits are also required for work. Work permits apply to all maintenance and new build activities at Gasunie installations and pipeline locations.

Critical Performance Indicators (CPIs)

Gasunie operates a system of CPIs, which indicate the extent to which targets that have been set previously have been met. The ultimate aim is: no incidents. CPI trends are monitored and targets are set for individual CPIs in order to enhance the impact on performance.



External safety

Our goal is to ensure the safety of everyone (local residents, people working, passers-by, and people spending leisure time) near our installations and pipelines. This is why we set high standards for the quality of our pipelines and installations, aiming at the highest safety level possible. We are constantly adapting our infrastructure to changing circumstances. We keep a close eye on what is being built along pipelines, and whether the work is being done safely, in order to prevent damage to pipelines. We also make sure that buildings do not encroach on our facilities, as this could endanger the safety of local residents. Where necessary we take steps, such as extra protection for the pipeline, or move a pipeline on the basis of building plans. This enables us to maintain security of supply and safety at the desired level.

It is important that safety zones are respected, both to protect our assets (such as protecting underground pipelines against the possible consequences of mechanical earth-moving operations) and to protect people against the very small chance of a major incident.

Aim

The aim of the external safety policy is to minimise the likelihood and consequences of the unwanted release of natural gas as a result of damage to the gas infrastructure.

In order to guarantee the safe and reliable transport of gas it is important that there is no interference with the location of the infrastructure. This means that we make every effort to prevent possible damage to the infrastructure. We aim to constantly reduce the number of cases of pipeline damage, and in addition, to have no such cases at all that involve the escape of natural gas. This is why strict work agreements apply at installations. In order to avoid the possibility of unwanted escalation of an incident, important components of installations are automatically made gas-free if incidents occur.

Preventive measures

We take a number of preventive steps to keep underground pipelines in good condition. Pipelines above ground are coated and undergo regular visual inspections. Underground pipelines are coated and given cathodic protection against corrosion. An ongoing programme of inspection is carried out to monitor the integrity of the transport system. Internal inspections are carried out with 'intelligent pigs' which pass through the gas stream and measure the condition of every tiny part of the pipeline. The data is collected and analysed, and adjustments are made to the network if necessary. Hundreds of kilometres of pipeline undergo internal inspection every year, and pipelines for which this is not possible undergo surface inspection.

Excavation by third parties

Mechanical excavation is still the main cause of damage to the underground pipeline network. Although preventing such damage is not entirely within Gasunie's control, we do all we can to reduce the chance of it happening. The Underground Networks Information Exchange Act (WION) came into force in the Netherlands on 1 July 2008. This law requires excavation contractors to report excavation activities to the Cable and Pipeline Information Centre (KLIC), which is part of the Land Registry. The law also specifies precautionary measures for the networks affected, such as marking the pipeline at the location where work is planned and supervision during the work. Strict adherence to the requirements set out in the law should further reduce the already small risk associated with pipelines. The Radiocommunications Agency monitors compliance with the law.





VELIN

Gasunie is a member of VELIN, the Association of Pipeline Owners in the Netherlands. It works with other members to achieve harmonisation in communication about precautionary measures. A standard template for KLIC notifications has been drawn up, along with general excavation conditions for work close to transmission pipelines.

Good performance

European gas transmission companies record their pipeline incidents in comparable ways. A comparison of our pipeline incidents involving the escape of gas with those of other European gas transmission companies (source: database of the European Gas Pipeline Incident Data Group (EGIG)) shows that on average we do better than the European average.

Safety of installations

Our installations also comply with strict standards, and so also meet strict external safety requirements laid down in legislation and regulations. This is recorded in extensive safety reports. Large sites are also subject to a reporting obligation under the BRZO (Major Accidents (Risks) Decree) and/or the Supplementary Risk Inventorisation and Evaluation (ARIE).

Process safety

Our installations are designed, constructed and maintained with safety as a prime consideration. We also ensure that they can be operated in an ergonomically responsible way, and that they are properly managed and operated by competent personnel.

Aim

Gasunie's aim is to prevent process safety incidents and constantly improve the level of process safety. We work to achieve this policy aim in all four phases of the infrastructure's life cycle: design, construction, operation and maintenance.

Integral approach

Attention is paid to aspects of process safety throughout the organisation. Over the coming years we will focus even more on an integral approach to this area of safety. Among other things, this will involve ensuring that process safety is better reflected in the existing management system, further increasing awareness of process safety, and internal information. A full set of CPIs is one of the points to be taken into consideration here. We also want to learn from relevant (potential) incidents affecting either Gasunie or contract staff in order to make any improvements. We have already made a start by mapping all aspects of process safety and recording how these aspects are covered within Gasunie.



Technical safety

The technical safety of gas infrastructure is a major priority for us. We reflect this in various ways, including making sure that our installations and pipelines are designed, built and operated safely and sustainably. The age of the infrastructure is an important issue in the years to come, and we will also have to give the necessary thought to the transmission of gases other than natural gas (such as hydrogen gas and biomethane) and the long-term effects of this on the integrity of the gas transmission system.

Aim

The aim of technical safety is to guarantee the intrinsic safety of gas infrastructure throughout its lifetime. We aim to improve the safety level continuously by the use of specific cases, trend analyses and modern inspection methods.





Gasunie Technical Standard (GTS)

Gasunie has set itself high standards for the design, installation and maintenance of its infrastructure. These are set out in the Gasunie Technical Standard (GTS). This set of documents contains the fruit of our many years of experience and expertise, and ensures that new infrastructure is constructed according to current understanding and legislation and regulations. We also operate inspection programmes involving period inspections to demonstrate and guarantee the integrity of the infrastructure. All new-build activities and maintenance work is carried out in accordance with GTSs and subject to (periodic) inspection.

Gasunie has implemented the NTA 8000 on integrity management as well as a safety management system.

Accreditation

Gasunie has been accredited by the government to inspect gas equipment used by large-scale users. This inspection service is part of the HSE department. It carries out all (inspection) tasks arising from the Commodities Act (Pressure Equipment) Decree (WWBD). All tests and inspections, both in the new-build phase and the use phase, are conducted internally to ensure the technical integrity of the infrastructure.



In conclusion

The safe and reliable transmission of gas is and remains Gasunie's core activity. For this reason we monitor our performance closely and are constantly looking for ways to improve it. Good and timely communication with people living or working in the surrounding area remains important, particularly as they are also important in ensuring that our infrastructure remains safe. The subsoil in the Netherlands is full of cables and pipelines, which can easily be (and often are) touched. This is why we must continue to make every effort to warn people who intend to use machinery on soil of the possible consequences. Interruptions to gas and electricity supplies cause major economic and social damage, and can be dangerous.

One important lesson that we have learned from experience is that we should never assume anything, but should always check ourselves whether a situation is safe. This is also why work permits are important. Consultation with the authorities on legislation and regulations, and their implications for the infrastructure, also remains high on our agenda. Within the company we constantly focus on the safety-consciousness of our employees and other people working for us. We think that management has an important role to play in this, and so we have introduced the HSE management code.

We believe that good HSE results are achieved by a skilled, motivated organisation. Management at all levels of

the organisation plays a critical part in this. Members of management commit themselves to the HSE objectives, act as role models both inside and outside the company, define clear tasks and responsibilities and make the necessary resources available, as guided by the HSE management code.

Gas infrastructure in a sustainable future

Gas, in the form of green gas or other products, and the gas infrastructure are an important part of a sustainable energy supply. They ensure stability and continuity when sustainable sources, such as sun and wind, are not available at the right time or in the right place. Gasunie's robust transmission network enables an affordable, sustainable energy supply. Safe and uninterrupted gas transmission will still be vital to society and the economy in the future.





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