



Commission for Energy Regulation

An Coimisiún um Rialáil Fuinnimh

**Gas Safety Regulatory Framework for Ireland – Safety Case Guidelines
for Licenced LPG Undertakings**

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CER – Information Page

The Electricity Regulation Act of 1999 gives the Commission for Energy Regulation (“the CER”) specific functions in the area of safety regulation of the Natural Gas industry. Further amendments in recent years have given the CER regulatory responsibility with respect to the safety of areas of the Liquefied Petroleum Gas industry that are not already regulated, including the regulation of LPG installers. The CER currently regulates natural gas undertakings through the Natural Gas Safety Regulatory Framework. It proposes to regulate LPG undertakings within the same Framework, using a safety case regime. As part of its responsibility to regulate LPG, the CER has been given the power to licence LPG undertakings operating piped distribution networks to final domestic customers. These licences will contain safety conditions only; there will be no economic conditions. As part of the licence requirements, LPG undertakings are required to submit a Safety Case to the CER. In order to assist LPG undertakings in drafting a Safety Case, the CER has drafted these Safety Case Guidelines document, for reference by LPG undertakings.

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1.0 Introduction

The Commission for Energy Regulation (“the CER”) currently regulates natural gas undertakings with respect to safety through a safety case regime. Under the 2012 Energy (Miscellaneous Provisions) Act (“the 2012 Act”), the CER has also been given the responsibility to regulate LPG undertakings with respect to safety, and to licence LPG undertakings operating piped distribution networks for individual domestic final customers. The CER intends to regulate LPG undertakings via a safety case regime and to expand the natural gas safety framework to include requirements for LPG licences. The CER proposes to enforce the framework via the conditions of these licences. The details of the new Safety Regulatory Framework for LPG undertakings are outlined in the *Consultation Paper Natural Gas Safety Regulatory Framework for Ireland (Ref: CER/13/029)* and the *Gas Safety Regulatory Framework for Ireland – Response to Consultation and Next Steps (CER/13/127)*.

These guidelines form part of the overall Gas Safety Regulatory Framework; they are one element of the suite of documents that form the Framework. The CER intends to licence LPG Distribution Undertakings from April 2014 and is working towards putting arrangements in place for this. Licence applications must be accompanied by a Safety Case for the individual undertaking making the application.

The CER carried out a consultation on the initial draft of the Safety Case Guidelines for licenced LPG undertakings. This was published on August 23rd 2013 and invited comment from industry and the public on the proposed guidelines. The responses received were favourable towards the CER’s proposals. Comments and responses are contained in the Consultation Response Paper “Safety Case Guidelines for Licenced LPG Undertakings – Consultation Response Paper” which is being published concurrently with this paper. In drafting this decision paper, the CER has taken into account any comments that were made in the responses received.

1.1 Purpose of this Paper

These Safety Case Guidelines ('the Guidelines') have been developed to assist LPG undertakings in the development of their respective safety cases for submission to the CER. Similar guidelines exist for Natural Gas undertakings. Although the Guidelines provide guidance on the appropriate contents of a safety case, they do not give absolute instructions on the information required for every safety case, as each safety case will vary slightly according to the undertaking in question. It is the responsibility of the undertaking to provide a safety case which demonstrates that the undertaking is implementing the safety management system described in the safety case.

The Safety Case is a working document that must be maintained and continually updated by the undertaking, such that it reflects the ongoing activities of the LPG undertaking in supplying LPG through piped distribution networks to multiple final domestic customers

1.2 Who do these Guidelines apply to?

The CER has a responsibility to licence LPG undertakings operating piped distribution networks to final domestic customers. The 2012 Act states that LPG shall not be made available by way of a piped LPG distribution network for use by individual domestic final customers unless a LPG Safety Licence is in force in respect of the activity¹. It defines a piped LPG distribution network as *"a pipeline system connected to a central storage bulk tank or LPG cylinder but not including a bulk tank or LPG cylinder as the case may be, and includes pipework above and below ground and all other equipment necessary upstream of the point of delivery and downstream of the emergency control valve, supplying gas to two or more customers."*²

¹ Section 9JE(1), Electricity Regulation Act 1999 (Inserted by the 2012 Act)

² Section 2(1)(a), Electricity Regulation Act 1999 (Inserted by the 2012 Act)

As previously stated, the CER will licence and regulate LPG undertakings operating piped distribution networks, via a safety case regime. These Guidelines describe the key aspects of LPG safety to be addressed by undertakings in the preparation of a safety case with respect to the use of LPG in such distribution networks. The focus of the safety case is on the safe management of the flow of LPG and response to emergencies by undertakings to ensure the safety of their customers and the general public. In particular this relates to the management of the safety risks associated with the design, construction, operation, maintenance, and modification/refurbishment and de-commissioning of LPG infrastructure. It is not the CER's intention that the safety case should address occupational health and safety or environmental aspects and impacts, as these areas are the responsibility of the Health and Safety Authority (the 'HSA') and the Environmental Protection Agency (the 'EPA'). Clearly, there are important safety issues and potential adverse environmental impacts that will need to be addressed in the safety case, however, it is not the intention that the safety case will contain extensive, detailed information on undertaking's occupational health, safety and environmental management systems.

1.2 Structure of Paper

This paper is structured in two sections. The sections are as follows:

- Section 2: This section provides an overview of the Safety Case submissions process, and the process for modifications to the Safety Case; and,
- Section 3: This section contains proposed safety case requirements for LPG undertakings operating piped distribution networks

2.0 Safety Case Process

2.1 Safety Case Submission Process

There are two stages to the safety case submission and assessment process; initial screening followed by detailed assessment.

Three hard copies of the Safety Case are to be submitted to the CER. Upon receipt of the submitted Safety Case, the document is registered, given a unique reference number and a file opened to contain all relevant documents and correspondence. An initial '**Content Scrutiny**' is carried out to ensure that the Safety Case document is complete as described in its own contents.

Subsequently, an '**Initial Screen**' of the document is undertaken by the CER to enable:

- a decision to be made on whether the document is suitable for further assessment;
- in consideration of the document and its initial screen, the development of an assessment plan, outlining team members, responsibilities and areas for detailed examination.

It is envisaged that Stage 1 of the process should be completed within **10 working days** of the date of receipt of the submitted document.

Stage 2 – Detailed Assessment

The detailed assessment of the submitted Safety Case will be undertaken upon completion of the activities outlined in Stage 1.

The major objectives are as follows: -

- determine the areas of the submission that are satisfactorily covered and can be accepted;
- identify areas where further information or clarification is required to enable suitability or otherwise to be determined;
- discuss and resolve issues with the representative of the LPG undertaking;
- agree areas where improvement is required;
- compile a report to recommend acceptance or rejection of the safety case; and
- identify topics for post acceptance inspections; these may include areas of perceived strength or weakness encountered during the assessment process.

It is envisaged that this process should be completed within **six** weeks of the date of receipt of the submitted document.

It is **not** the intention of the CER to make publicly available all, or any part, of an undertaking's Safety Case. Safety Cases are regarded by the CER as confidential documents and will be treated as such.

2.2 Safety Case Assessment

The CER's aim in carrying out assessments of submitted safety cases is to satisfy itself that LPG undertakings operating piped distribution networks have made appropriate and sufficient arrangements to ensure that the LPG safety risks that arise from the carrying out of the undertakings business activities are reduced and controlled to a level that is as low as reasonably practicable. Safety cases will be assessed according to criteria developed by the CER to verify that:

- A sufficiently detailed description of the undertakings organisational arrangements, key safety responsibilities, operational characteristics and the nature and extent of any infrastructure assets are provided such that an assessment of the LPG related safety risks can be made;
- A detailed and systematic assessment of LPG related safety risk has been undertaken that is based on the range of activities described in the Facility Description, and that the risks are managed to a level that is considered by the CER to be as low as reasonably practicable;
- The undertaking's safety management systems, as described , are adequate to control the LPG safety risks that arise from the operations of the LPG undertaking and are identified in the Formal Safety Risk Assessment; and
- In the event of a LPG emergency situation or a major accident arises, the undertaking's emergency procedures and arrangements are adequate to provide a coordinated and effective emergency response and restoration of supply.

The purpose of the assessment is to examine the evidence as presented in the safety case. It is the responsibility of the undertaking to demonstrate that suitable safety arrangements are in place and that LPG safety risks are being managed and controlled to an acceptable level. The emphasis of the safety case regime is on 'demonstration' by the LPG undertaking that acceptable safety arrangements for the management of LPG-safety related risks are in place and working effectively. In this context, demonstration involves a higher standard than simply describing the way measures work or are expected to work. There will be a requirement on the undertaking to provide evidence that the measures described in the safety case work in practice and are monitored

to ensure that this actually happens. Appendix 4 gives more information on what is meant by 'demonstration'.

The CER's role with respect to the safety case will be to:

- develop and update the Safety Case Guidelines for providing the safety information requirements within the agreed structure of the safety case utilising a formal change control procedure;
- reviewing and assessing submitted safety cases according to established assessment criteria for acceptance or approval of the safety case.
- issuing safety licences to LPG undertakings operating piped distribution networks, following assessment of their safety case;
- monitoring and auditing the activities of undertakings to assess compliance with their safety cases on a programmed basis; and
- requiring LPG undertakings to carry out a full independent review of the safety case every 3 years to ensure that the safety case remains as a 'living document' within the organisation and fully reflects the current safety operating measures and practices and to report to the CER on the findings of the review.

Safety cases that have undergone assessment and subsequent acceptance or approval by the CER will be required to be implemented within a timescale agreed by the CER and the undertaking. Safety case assessment is not a 'one-off' activity and each undertaking's safety case will be subject to an ongoing audit and inspection regime to verify that the arrangements in the safety case are actually operating in practice.

2.3 Safety Case Modifications

2.3.1 Material Changes

An undertaking's safety case is regarded by the CER as a 'living document' within the organisation and should be maintained as an up-to-date document in order to reflect what the CER may regard as material changes.

Material changes are considered by the CER to include:

i) *Facility Description:*

- changes in ownership and/or operating responsibility;
- changes in management structure and key safety responsibilities, particularly with respect to the safety case duty holder and the person responsible for the ongoing management of the safety case; and,
- significant changes to the capacity, configuration and/or operation of the undertaking's LPG infrastructure assets

ii) *Formal Safety Risk Assessment:*

- changes in risk levels that are identified via the ongoing assessment of safety risks, which may include:
 - new or previously unidentified safety risks; and
 - increases in the level of a previously identified risk.

iii) *Safety Management System*

- amendments to key safety related policies and procedures;
- outsourcing of gas related safety functions, e.g. emergency response;
- changes in the responsibilities of key safety staff; and
- changes in O&M practices.

iv) *Emergency Procedures*

- changes that are implemented as a result of the outcome of investigations into emergency incidents

The above list is not intended to be exhaustive but to provide an indication of changes that would, in the opinion of the CER, be of sufficient materiality to warrant a modification to the undertaking's safety case. It is anticipated that undertakings will liaise closely with the CER during the development, submission and assessment of their respective safety cases and identify those aspects of the safety case where future proposed changes to the facility description, formal safety risk assessment, safety management system or emergency procedures would be regarded as material and require a safety case modification and re-assessment by the CER. Additionally, undertakings should recognise that the cumulative effect of a series of relatively minor, non-material changes may well result in the need for a safety case modification. As such, all changes in the undertaking's operating practices should be considered in the context of the potential impact on the safety case, which has been accepted or approved by the CER.

The CER will work with undertakings to develop an understanding of what may constitute a material or non-material change with the objective that, over time, undertakings will be in a better informed position to make their own judgement within the context of the above.

2.3.2 Safety Case Modifications Process

2.3.2.1 Material Changes

Where proposed changes in the undertakings safety arrangements are regarded by the undertaking as material, the undertaking shall:

1. Inform the CER of the proposed change and provide:
 - the details of the proposed change; and
 - the reasons for the change

2. Undertake a safety risk impact assessment of the proposed change and submit the results of the safety risk impact assessment to the CER for review;
3. Modify and update the safety case;
4. Provide the CER with an updated version of the modified safety case for acceptance/approval; and,
5. Implement the change within the agreed timescale.

2.3.2.2 *Non-Material Changes*

For changes that are considered by the undertaking to be relatively minor or non-material, the undertaking shall:

1. Undertake a safety risk impact assessment of the proposed change;
2. Where the level of safety risk resulting from the proposed change remains the same without the application of additional constraints, or is lowered, the undertaking shall update its safety case to reflect the change and make a record of the change and the associated risk assessment. There will be no requirement to notify the CER in this circumstance; and
3. Where the safety risk impact assessment shows that the proposed change increases the level of inherent safety risk, the undertaking shall notify the CER. The CER will then liaise with the undertaking in order to determine if the proposed change can be implemented whilst maintaining safety risk at an acceptable level. Alternatively, the CER may view the proposed change as material and the undertaking will follow the process described above for material changes.

2.3.3 Recording Changes and Modifications

An important requirement with respect to changes in safety arrangements and modifications to safety cases is the need to safely assess all proposed changes prior to implementation and record such risk assessments and changes by updating all relevant documentation, whether held centrally or circulated amongst staff and operatives to provide an audit trail of changes. In this way, there is 'demonstration' that the safety case is maintained as a 'living document' within the undertaking and is evidence that the undertaking is operating in compliance with their safety case.

2.4 Safety Case Reporting Framework

The safety case regime includes a Safety Reporting Framework that will be used to assess the overall effectiveness and performance of the Gas Safety Regulatory Framework. Where relevant, it is proposed undertakings will be required to report on the following basis:

- (i) **Immediate Incident Reporting** by LPG undertakings to the CER whereby a LPG emergency incident has occurred or there has been a LPG related injury or fatality. The CER will write regulations to this effect³;
- (ii) **Quarterly Safety Reporting** by LPG undertakings to the CER based on a suite of key safety performance indicators (KPIs) that are specific to the operational activities of the undertaking. These safety performance indicators will be developed within the context of the Safety Case Guidelines and through liaison between the CER and the individual undertakings. A suggested suite of safety KPIs for all undertakings is included in Appendix 3 of this document ; and

³ Section 9JG of the 1999 Electricity Regulation Act

- (iii) An **Annual Safety Report** to the CER which should provide a detailed description of the overall safety performance of the undertaking during the year and the actions that the undertaking proposes to undertake to improve gas safety. This will feed into the process whereby the CER will provide an annual report to the Minister on the safety outcomes for both the natural gas and LPG industries and the performance of the Gas Safety Regulatory Framework.

Individual undertakings will need to develop safety-specific key performance indicators, which are relevant to their business, and liaise with the CER on the appropriateness of the KPI's for assessing the safety performance of the undertaking.

3.0 Requirements for LPG Distribution System Undertakings

This section of the Guidelines contains the specific minimum information requirements for the development of the safety case for **LPG undertakings operating piped LPG distribution system(s)**, as defined in Section 1.1. These are minimum information requirements and it is the responsibility of the relevant undertaking to provide sufficient information in order to allow the CER to make an assessment of the adequacy of the safety case. A balance will need to be struck between the material to be included in the safety case and supporting information, which can be cross-referenced and provided on request. As a guiding principle, safety cases should be presented as self-contained documents which:

- present the main safety arguments clearly and succinctly so that the core principles can be readily understood; and
- include sufficient detail to establishing a convincing case for the safety arrangements.

This section describes the layout of the Safety Case, and the information that should be contained in each section.

3.1 Executive Summary

An Executive Summary should be included at the beginning of the document. It should explain the LPG undertaking's approach to risk management, describes the generic LPG safety risks that arise from the LPG distribution operations and give a brief description of the structure of the safety case. The aim is to demonstrate that there are comprehensive safety management systems in place to identify, assess, manage and control the risks associated with the safe management of the supply of LPG and the response to emergencies.

3.2 Introduction

The safety case should commence with an Introduction that provides information on:

- 1.1 Scope and objectives of the safety case;
- 1.2 References to licence conditions;
- 1.3 Identification of those person(s) responsible for the preparation and maintenance of the safety case;
- 1.4 The contact details of the person with whom the CER will liaise on matters regarding the safety case; and
- 1.5 A description of the formal change control procedure(s) that will be applied to the safety case.

3.3 Facility Description

A **‘Facility Description’** that describes the nature, activities, location, organisation structure, safety related responsibilities and LPG infrastructure assets (where applicable) employed, or with involvement in, in carrying out the piped distribution activities. The Facility Description must provide sufficient information to enable the extent and scope of the assets and operations of the LPG undertaking in relation to the facility and the risks associated with those assets and operations to be assessed. It should provide information on the following aspects of the undertaking’s operations:

- The name of the person and position who has overall managerial responsibility for the part of the business that manages piped LPG distribution networks;
- The name of the ‘Duty Holder’ with respect to the safety case, and their position within the organisation. The ‘Duty Holder’ will be a person who is a representative of the operation of the undertaking’s facility – i.e. the person who represents the ‘controlling mind’ with regard to the day-to-day operating decisions that are taken;
- The name of the person who is responsible for the preparation and submission of the safety case;
- details of personnel with key LPG operational responsibilities and a description of how LPG technical safety competencies are resourced;
- The geographic areas covered by the company and the numbers of domestic customers supplied by piped LPG distribution networks;

- The location of the undertaking's headquarters or main office, the location of subsidiary offices and a description of the activities (relevant to piped LPG distribution systems) undertaken at each location;
- A management organisation structure for the part of the business that deals with LPG piped distribution networks, that describes how the management of LPG safety is undertaken, who has responsibilities for LPG safety, the numbers of personnel employed in each department/function and the key safety interfaces with operational staff;
- A description of the activities relevant to piped LPG distribution systems undertaken within the LPG business, how these are organized and the resources employed to manage the operations of the distribution networks side of the business; and
- A description of the different methods of LPG distribution to individual final domestic customers including:
 - a description of the network assets that includes:
 - commonly used length, diameter, pipe materials & operating pressures of the distribution pipe systems
- Suitable maps, drawings, tables, charts and diagrams should be used to convey information wherever appropriate.

The Facility Description must provide sufficient information to enable the extent and scope of the assets and operations of the LPG undertaking in relation to the facility and the associated risks to be assessed

3.4 Formal Safety Risk Assessment

A '**Formal Safety Risk Assessment**' that is consistent with the activities described in the Facility Description. It is based on a detailed and systematic assessment of risk, including the likelihood and consequence of a LPG safety related incident occurring and a description of the mitigation measures adopted to ensure that identified risks are maintained at a level that is as low as reasonably practicable. The risk assessment process should take into account the safety risks inherent at each of the stages of design, construction, operation, maintenance, modification and decommissioning of LPG infrastructure assets. It is not the intention of the CER to be prescriptive on the approach to risk management as many businesses will already operate within the context of recognised risk management frameworks. However, an important requirement of the Formal Safety Risk Assessment is that identified safety risks are mitigated to a level that is as low as reasonably practicable (ALARP). The Formal Safety Risk Assessment for a facility should provide:

- investigations undertaken and a description of the methodology used for the Formal Safety Risk Assessment;
- an identification of all hazards and initiating events with the potential to cause a LPG incident on a piped LPG distribution network;
- a detailed and systematic assessment of risk, including the likelihood and consequence of a gas incident;
- a description of technical and other measures undertaken, or to be taken, to reduce that risk to a level that is ALARP; and
- Copies of any reports arising from the studies and investigations undertaken for the purposes of the Formal Safety Risk Assessment.

It should be noted that the CER's judgements on whether risks are being managed to a level that is as low as reasonably practicable will be based on a combination of factors. There is no general interpretation of what constitutes 'right' or 'wrong' in this sense as what is tolerable for one safety risk will be different to what is considered tolerable for a different safety risk. If necessary, the CER will discuss its interpretation of ALARP with individual undertakings on a case by case basis.

The safety case should provide information on the processes adopted to systematically identify and assess all reasonably foreseeable hazards for LPG incidents on piped distribution networks, in order to determine the likelihood and consequence of the actual risks that they present to persons and property at each stage of the asset lifecycle – i.e. design, construction, operation & maintenance, modification/refurbishment and de-commissioning.

The descriptions should include the methods of any analyses made and details of any assumptions made regarding asset and human performance and reliability. The level of detail required (including with respect to the sophistication of the risk assessment) should be proportional to the nature and complexity of the operations of an undertaking operating piped distribution networks, and hence to the risks being controlled at a level that is as low as reasonably practicable .

3.4.1 Hazard and Risk Identification and Assessment

With respect to hazard identification, the LPG undertaking should identify all significant hazards that arise from the operation of distribution networks. An assessment should be made of all the identified hazards in order to determine the likelihood and consequences of the risks that may arise. The assessment may be carried out using qualitative and/or quantitative techniques as considered appropriate by the distribution undertaking. The results of the hazard and risk assessments should be used to identify and rank major risk contributors. Risk management strategies should include prevention,

protection and mitigation activities and risk reduction strategies should be established for all significant risks.

3.4.2 Recording of Risks

The results of the hazard and risk identification and assessment process should be recorded in a suitably formatted 'risk register' that record details of:

- identified hazards and initiating events and their causes;
- existing safety controls that are used to manage the risk;
- an assessment of the risk based on the likelihood and consequence of the risk occurring and tolerability of the risk according to the principle of ALARP;
- a description of any additional control measures that are required to reduce the risk to ALARP;
- a revised assessment of risk based on the implementation of the additional control measures to demonstrate ALARP; and
- the name of the person who is responsible for the day-to-day management of the risk(s).

3.4.3 Monitoring and Review of Hazards and Risks

There should be a description of the processes used to ensure that any new risks are identified and that existing risks are regularly reviewed to ensure that they are still valid, have not altered in terms of likelihood and/or consequence and are not outdated or redundant as a result of changes in organisational or operational circumstances.

3.5 Safety Management System

The '**Safety Management System**' describes the system that the LPG undertaking employs to effectively manage the safety risks as identified in the Formal Safety Risk Assessment – i.e. the safety policy, organisation, planning, implementing, audit and performance monitoring and reviewing systems used by the gas undertaking to manage their business-specific safety risks to an acceptable level and ensure that there is a process for continual improvement in place. The Safety Management System should also address the human factors (competencies and capabilities) of staff and contractors that are important in managing and controlling the safety hazards and risks that are identified in the Formal Safety Risk Assessment. The Safety Management System should address the safety risks identified in the Formal Safety Risk Assessment in a manner that reduces all identified risks to a level that is (ALARP).

The Safety Management System should describe, at a minimum, how the LPG undertaking provides for the safe and reliable flow of LPG within a piped distribution network for the duration of the lifecycle of these assets. The essential elements of the Safety Management System are outlined in the following sections.

3.5.1 Safety Management Policy

The Safety Management System should make reference to the specific Safety Policy documents published by the distribution undertaking that set out the safety management objectives with regard to the safe management of LPG distribution networks. This section should describe the approach and methodology used to ensure that the LPG distribution systems are designed, constructed and operated and maintained in a safe manner, and how this will be achieved.

There should be a clear statement of the undertaking's intention to implement its Safety Policy regarding the prevention of risk and the protection from hazards to all persons who may be affected by its activities and how the undertaking proposes to meet its safety objectives. The policy documents must be endorsed by a responsible person with sufficient authority to ensure that all safety-related commitments within these documents are met.

3.5.2 Technical Standards

The Safety Management System should contain a list of all relevant Irish, European and other international codes, standards and recommendations (referred to collectively as "authoritative best practice") that are used by the LPG undertaking for the design, construction, operation and maintenance, modification and decommissioning of a piped LPG distribution system. These should include a list of updated current technical standards and legacy or historical technical standards used for the design and construction of existing assets. It is important that the LPG undertaking has a system for assuring itself that the technical standards and specifications that are currently being used are the latest version. As such, the Safety Management System should describe the process for ensuring that all amendments and new editions are recorded and an up to date list of standards is maintained and published.

3.5.3 Asset Lifecycle Safety

3.5.3.1 Design

The Safety Management System should describe in detail the design principles applied to ensure that all identified hazards and risks are eliminated or reduced to a level as low as reasonably practicable during the life cycle of the network assets. The design requirements should include both the physical assets and the associated monitoring systems for networks.

3.5.3.1.1 Design Inputs

Key inputs to the design process should include:

- a list of identified design hazards and risks;
- a statement of the piped LPG distribution system design policy;
- a description of the system design parameters for all network assets – e.g. mains, services, equipment and fittings, and meters; and
- identification of the various codes, standards and recommendations adopted.

3.5.3.1.2 Design Process Controls

Controls over the design process should include a description of:

- the policies and procedures used for piped LPG distribution system design;
- the risk mitigating measures adopted;
- the systems and tools used for design and modeling; and
- the design validation and approval process.

3.5.3.1.3 Design Outputs

The outputs from the design should include:

- construction plans and specifications;
- performance standards, both in terms of risks and operational performance; and
- specific operational procedures required for safe operation.

3.5.3.2 Construction, Testing & Commissioning and Work Recording

The Safety Management System should describe in detail how the Operator manages the processes of installation (includes pipe replacement, reinforcement and alterations/diversions), testing and commissioning in accordance with the adopted codes,

standards and specifications. The Operator should provide demonstration of the processes for:

- ensuring that construction activities are undertaken by staff and/or contractors who possess the requisite qualifications, training, skills & experience and competencies to undertake the work in a safe manner;
- assessing and verifying that the construction work undertaken complies with the specifications;
- ensuring that post-construction and pre-commissioning testing is undertaken in a safe and competent manner and is sufficient to prove that the installed asset is suitable for its intended use;
- ensuring that assets are commissioned as per an agreed procedure; and
- recording the as-laid locations of piped LPG distribution networks.

3.5.3.3 *Operation and Maintenance*

The Safety Management System should describe in detail how the operation and maintenance of network assets are undertaken, taking into account the particular risks posed by the asset under consideration. This should also extend to the associated systems that are in place to support the operation and maintenance of the assets – e.g. drawings, plans, maintenance records, permitry etc.

3.5.3.3.1 Preventative Maintenance, which includes such activities as:

- third party damage prevention;
- prevention of ground movement, e.g. subsidence;

- meter maintenance, including customer's downstream equipment; and
- permit-to-work systems.

3.5.3.3.2 Corrective Maintenance, which includes such activities as:

- attending public reported escapes (PREs) both inside and outside the property, including 3rd party damage, reports of 'no gas', fires, explosions, CO incidents etc;
- other asset-related emergency maintenance that may be required to be undertaken as identified in the Formal Safety Risk Assessment.

3.5.3.3.3 Supporting Systems Maintenance, which includes such activities as:

storing and updating asset records – i.e., drawings, plans, databases, etc. The Safety management system should describe how installations are installed in accordance with the relevant Irish Standards before LPG is supplied or re-supplied to the premises.

3.5.3.4 *Modification, Replacement and Reinforcement*

The Safety Management System should describe in detail the processes that the Operator uses for undertaking network modifications, replacements and reinforcements including the processes for:

- identifying the need for modification, replacement or reinforcement;
- developing, designing and selecting the chosen approach to modification, replacement or reinforcement;
- approving the selected design; and
- updating asset records.

3.5.3.5 *De-Commissioning and Abandonment*

The Safety Management System should describe in detail the processes that the Operator uses for de-commissioning and abandoning distribution assets including:

- identifying the need for de-commissioning and abandonment of an asset;
- assessing the impact of the decision to de-commission and abandon an asset; and
- recording of de-commissioned and abandoned assets on the company's asset database

Abandonment procedures are only of concern for partial abandonment of piped distribution systems, where there is a need to ensure that redundant supplies are appropriately isolated from live networks.

3.5.4 New Connections and Re-connections

The Safety Management System should provide a description of the control processes in place for ensuring that customers downstream (of the meter) installations are installed in accordance with relevant Irish Standards before LPG is supplied, or re-supplied, to the premises.

3.5.5 Procurement

The Safety Management System should provide a description of the controls which will be applied to ensure that contractual arrangements entered into with third parties give appropriate assurance of safety. In particular, they should ensure that no person is exposed to unacceptable risk from the actions and services or from the equipment and products provided to the LPG Undertaking by external providers. The controls should include processes for:

- undertaking pre-contract checks on competency of personnel and conformity of products and equipment with relevant standards and specifications;
- assessing the overall safety management systems of the provider; and

- arrangements for monitoring of compliance with agreed safety standards.

It must also be ensured that appropriate contractual arrangements are in place for outsourced safety-critical expertise.

3.5.6 Human Factors

The Safety Management System should describe how the LPG Undertaking addresses the human factors that are important to the management of the safe flow of LPG in piped distribution systems and managing the response to LPG emergency incidents. In particular, the Safety Management System should include processes for:

- identifying safety critical roles, responsibilities and tasks at all levels in the organisation, including management, operational staff and contractors;
- identifying the role specific competencies and capabilities that are required to ensure the safe management of the flow of LPG and the response to emergencies;
- selecting, recruiting, training, assessing and re-assessing staff and contractors;
- demonstrating that there is adequate availability of competent personnel (including contractors) for the safe management of the flow of gas and the response to emergencies; and
- demonstrating that adequate supervision of personnel in safety critical roles is provided, and that a satisfactory teamworking culture is maintained.

3.5.7 Consultation, Communication and Cooperation

The Safety Management System should describe the systems in place for involving staff, either directly or through their representatives, in the development and implementation of the Safety Management System, and for consulting with staff and their representatives generally on issues relating to safety.

A description of the processes for the communication of safety information both internally and externally to the organisation and cooperation with external bodies with respect to LPG safety should be provided. This should include a description of the processes for the communication of safety information:

- upwards and downwards within the undertaking;
- to and from other market participants;
- to and from other utilities, local authorities, construction industry and other third parties with respect to the protection of plant;
- to and from the CER; and
- to and from end-use customers and the general public.

The Safety Management System should also describe any cooperative arrangements that exist between the undertaking and other external bodies that have interests in gas safety issues. For example these external bodies include:

- architects, building design consultants and developers;
- installation contractors;
- gas consumer representative bodies;
- Health and Safety Authority;
- National Standards Authority for Ireland; and
- Government departments and other public and institutional bodies.

3.5.8 Documentation, Data and Records Management

The Safety Management System should describe the documentation, data and records management systems that relate to asset and operational safety performance, including:

- the type and extent of asset and operational data to be collected;
- the mechanisms that are used to collect, analyse, interpret and record the data;
- how asset and operational documentation and data is made available to those authorized persons requiring access to the data;
- how changes to documentation, data and records are communicated to the relevant staff; and
- how obsolete documents, data and information are removed from points of issue and use.

The Safety Management System should also describe the IT systems, databases and any other means of recording asset and operational safety performance data and how the data is protected, updated, retrieved, 'backed-up' and archived.

3.5.9 Change Management

The Safety Management System should describe the systems and procedures implemented to ensure that the risks arising from changes to the undertaking are assessed and properly controlled both during the change process and after its completion. Examples of such changes include:

- major organisational changes that impact key safety related roles and responsibilities;

- changes to operating policies and procedures that may affect piped distribution activities; and
- outsourcing of key activities.

The Safety Management System should also contain procedures for analysing proposed changes through the Formal Safety Risk Assessment process. Where a change is deemed by the undertaking to be 'material', the CER should be notified in accordance with the guidance on 'Safety Case Modifications' as explained in Section 2.3.2 of these Guidelines.

3.5.10 Accident and Incident Investigation

The Safety Management System should provide evidence of appropriate arrangements for investigating LPG safety-related accidents and incidents. It should show that sufficient skill will be applied to ascertain not only the immediate cause(s) but also the 'root cause' of such accidents and incidents. The arrangements for carrying out accident and incident investigation should also describe how recommendations to prevent recurrence are made and how follow-up actions are managed.

3.5.11 LPG Safety Promotion and Public Awareness

The Safety Management System should provide a description of how the LPG Undertaking promotes LPG safety to raise public awareness of the potential dangers of LPG. This will include for example:

- advertising the undertaking's national LPG emergency number;
- advising on the actions to be taken in the event of a suspected LPG leak;
- protecting underground LPG assets or services from the activities of third parties; and

- issuing advice on safe working in the vicinity of underground LPG equipment.

3.5.12 Safety Reporting

The Safety Management System should provide details of the safety reporting framework that the distribution undertaking uses to demonstrate that LPG safety is being managed effectively, that safety trends are analysed and progress towards safety performance objectives and targets are being achieved. The safety reporting framework should provide details of:

- the reporting regime for LPG emergency incidents, a definition of the various categories of incident that may arise and the process and person interfaces involved in incident reporting and subsequent investigation;
- the structure and contents of the quarterly safety reports that the LPG undertaking will be required to submit to the CER. This should include a description and explanation of the safety key performance indicators (KPIs) that are used in measuring LPG safety performance. Suggested KPIs are included in Appendix 3 of this paper; and
- the structure and content of the annual safety report that the LPG undertaking will be required to submit to the CER. This should include a detailed description of the overall safety performance of the LPG Undertaking during the year and the actions that the undertaking proposes to take to improve LPG safety on distribution networks.

3.5.13 Audit and Inspection

The Safety Management System should describe the arrangements for safety audit and inspections as a continuing management and monitoring tool and

the resources which will be applied to it. The audit and inspections regime should be based on the assessment of risk as it applies to the asset or activity under consideration. There should be a description of the approach to undertaking audit and inspection, which should include:

- the timing of routine audits and inspections – daily, weekly, monthly, quarterly, annually;
- the structure of audits and inspections – activity v. process; and
- persons undertaking audits and inspections.

There should be a description of how the results of audits and inspections are fed back into the performance monitoring and review process.

3.5.14 Performance Monitoring and Review

The Safety Management System should describe how the LPG undertaking reviews and assesses the safety performance of its assets and operations and should include the following:

- the approach to setting safety performance objectives and targets and the details of the intended frequency of monitoring progress towards the targets and who will be directly involved in reviewing the results;
- the methodology used to process data in order to monitor trends and progress towards safety performance objectives and targets and identification of the resources used to undertake such data processing and analysis;
- the process for determining whether the safety performance objectives and targets have been achieved and how the extent of any safety performance 'gaps' are assessed; and

- the process for making recommendations on the corrective actions to be taken, approving the proposed corrective actions and monitoring outcomes for the results of corrective actions.

3.5.15 Continual Improvement

The Safety Management System should provide a description of the procedures for the regular and ongoing re-evaluation of the Safety Management System and the initiation of any necessary improvements. The inputs to this process should include the outcomes of the actions taken under the following headings:

- Accident and Incident Investigation;
- LPG Safety Promotion and Public Awareness;
- LPG Safety Reporting;
- Audit and Inspection; and
- Performance Monitoring and Review.

3.6 Emergency Procedures

The Emergency Procedures section should describe in detail how the LPG undertaking will fulfill its duties and obligations in an emergency situation on a piped distribution network.

The Emergency Procedures should describe clearly the actions that the undertaking will undertake at each step of a LPG emergency situation and how, and by whom, these actions will be carried out.

The Emergency Procedures should also identify:

- the structure of the emergency management team that will coordinate the response to the LPG emergency incident;

- the individual persons that will undertake any emergency management roles required;
- the contact details of the personnel on the emergency standby rota;
- the training that is given to ensure that these roles can be fulfilled safely and competently;
- the resources (personnel and facilities) that will be employed in providing an effective emergency response; and
- the frequency of testing of the emergency response capability that the undertaking carries out in order to assure itself that an effective emergency response can be provided both during and out of normal working hours.

Due to the nature of LPG emergencies, significant interaction with emergency services is to be expected. Along with detailing the LPG undertaking's emergency arrangements, the Safety Case should describe any arrangements that are in place with third party emergency services such as Fire Services, Gardaí, etc to manage LPG incidents.

APPENDIX 1 - TECHNICAL SPECIFICATIONS

The following list of relevant technical specifications as proposed by the National Standards Authority for Ireland (NSAI) is considered suitable and relevant to the activities falling within the scope of this document.

This list contains undated references. The user is expected to use the latest version together with all amendments and corrections if any. It should be noted that the list is not exhaustive and there may be other specifications relevant to the scope.

1. I.S. 265: Parts 1 and 2
Installation of Gas Service Pipes.
2. I.S. 329 :
Gas distribution mains
3. I.S. EN 331:
Manually operated ball valves and closed bottom taper plug valves for gas installations for buildings
4. I.S. EN 334:
Gas pressure regulators for inlet pressures up to 100 bar
5. I.S./EN 549:
Rubber Materials for Seals and Diaphragms for Gas Appliances and Gas Equipment
6. I.S. EN 682:
Elastomeric seals - Materials requirements for seals used in pipes and fittings carrying gas and hydrocarbon fluids
7. I.S./EN 751-1:
Sealing materials for metallic threaded joints in contact with 1st, 2nd

and 3rd family gases and hot water - Part 1: Anaerobic jointing compounds

8. I.S./EN 751-2:

Sealing materials for metallic threaded joints in contact with 1st, 2nd and 3rd family gases and hot water - Part 2: Non-hardening jointing compounds

9. I.S./EN 751-3:

Sealing materials for metallic threaded joints in contact with 1st, 2nd and 3rd family gases and hot water - Part 3: Unsintered PTFE tapes

10. I.S. 813:

Domestic gas installations

11. I.S. 820:

Non-domestic gas installations

12. I.S./EN 1057:

Copper and copper alloys - seamless, round copper tubes for water and gas in sanitary and heating applications

13. I.S. EN 1106:

Manually operated taps for gas burning appliances

14. I.S. EN 1359:

Gas meters - Diaphragm gas meters

15. I.S. EN 1555-1:

Plastics piping systems for gaseous fuels supply - Polyethylene (PE) – General

16. I.S. EN 1555-2:

Plastics piping systems for gaseous fuels supply - Polyethylene (PE) – Pipes

17. I.S. EN 1555-3:

Plastics piping systems for gaseous fuels supply - Polyethylene (PE) –

Fittings

18.I.S. EN 1555-4:

Plastics piping systems for gaseous fuels supply - Polyethylene (PE) –
Valves

19.I.S. EN 1555-5:

Plastics piping systems for gaseous fuels supply - Polyethylene (PE) –
Fitness of purpose of the system

20.I.S. EN 1643:

Valve proving systems for automatic shut-off valves for gas burners
and gas appliances

21.I.S. EN 1775:

Gas supply - Gas pipework for buildings - Maximum operating pressure
less than or equal to 5 bar - Functional recommendations

22.ISO 4437:

Buried polyethylene (PE) pipes for the supply of gaseous fuels -- Metric
series -- Specifications

23.I.S. EN 12007-1:

Gas supply systems - Pipelines for maximum operating pressure up to
and including 16 bar – Part 1: General functional recommendations

24.I.S. EN 12007-2:

Gas supply systems - Pipelines for maximum operating pressure up to
and including 16 bar – Part 2: Specific functional recommendations for
polyethylene (MOP up to and including 10 bar)

25.I.S. EN 12007-3:

Gas supply systems - Pipelines for maximum operating pressure up to
and including 16 bar – Part 3: Specific functional recommendations for
steel

26.I.S. EN 12007-4:

Gas supply systems - Pipelines for maximum operating pressure up to and including 16 bar – Part 4: Specific functional recommendations for renovation.

27.I.S. EN 12261:

Gas meters - Turbine gas meters

28.I.S. EN 12279:

Gas supply systems - Gas pressure regulating installation on service lines - Functional requirements

29.I.S. EN 12327:

Gas supply systems - Pressure testing, commissioning and decommissioning procedures - Functional requirements

30.I.S. EN 12405-1:

Gas meters - Part 1: Volume conversion

31.I.S. EN 12480:

Gas meters - Rotary displacement gas meters

32.I.S. EN 13090:

Means for resealing threaded joints of gas pipework in buildings

33.I.S. EN 13774:

Valves for gas distribution systems with maximum operating pressure less than or equal to 16 bar - Performance requirements

34.I.S. EN 13787:

Elastomers for gas pressure regulators and associated safety devices for inlet pressures up to 100 bar

35.I.S. EN 14141:

Valves for natural gas transportation in pipelines – Performance requirements and tests

36.I.S. ENV 14236:

Ultrasonic domestic gas meters

APPENDIX 2 – SUGGESTED KEY PERFORMANCE INDICATORS

No.	Key Objective	Gas Safety Performance Indicator (SPI)
1	Minimising the Risk of Loss of Containment	1.1. No. of public reported escapes: a) external; and b) internal 1.2. No. of 3 rd party damages to: a) distribution services 1.3. No. of joint leaks 1.4. No. of mains leak repairs 1.5. No. of gas in building events 1.6. No. of evacuations undertaken 1.7. No. of distribution pipeline corrosion defects detected
2	Maintaining Safe System Operating Pressures	2.1. No. of verified poor pressure complaints 2.2. No. of over-pressure events
3	Minimising the Risk of Gas of Non-Conforming Quality	3.1. No. of non-compliant gas odorant test results
4	Providing an Efficient and Coordinated Response to Gas Emergency Reports and Incidents	4.1. No. of distribution system related gas emergencies attended 4.2. No. of gas quality related gas emergencies
5	Minimising the Risks Associated with the Utilisation of Gas	5.1. No. of residential completion certificates issued 5.2. No. of residential installations inspected 5.3. Average number of defects per residential installation inspected 5.4. No. of metering tampering events discovered 5.5. No. of internal gas related incidents attended: a) fires b) explosions

		c) CO related
6	Promoting Public Awareness of Gas Safety	To be discussed with individual undertakings

APPENDIX 3 - REQUIREMENTS FOR DEMONSTRATIONS

Under the current regulatory framework for natural gas undertakings, the emphasis of the Safety Case regime is on ‘**demonstration**’ by the undertaking that acceptable safety arrangements for the management of gas-safety related risks are in place and working effectively on a day-to-day basis. The same will be required of LPG undertakings that apply for a safety licence. In this context, demonstration involves a higher standard than simply describing the way measures work or are expected to work. There will be a requirement on the undertaking to provide evidence that the measures described in the safety case work in practice and are monitored to ensure that this actually happens”.

The safety case contents describe the safety management systems that the undertaking has put in place to ensure that LPG safety risks arising from the activities of the undertaking in operating piped distribution networks are controlled to a level that is considered by the undertaking to be as low as reasonably practicable. The safety management systems consist of various policies, procedures, processes, codes, recommendations, technical standards and specifications that are used by the undertaking to manage and control LPG safety risks and these will be referenced in the safety case. However, it will not be acceptable to merely quote such documents within the safety case as evidence that safety management systems are based on robust management arrangements. There will be a requirement to provide evidence of:

- How the safety-related policies and procedures are effectively implemented within the undertaking and who has responsibility for implementation;
- What monitoring and control measures are in place to ensure that the safety-related policies and procedures are implemented effectively;

- How often policies and procedures are reviewed;
- How safety-related data is collected and stored – what systems, databases are used;
- Who reviews safety-related data, how often and how does this inform decision-making as to what actions are required;
- Etc.

The CER will seek evidence that the undertaking has made a robust 'case' that the necessary safety measures are in place and that management has the ability to support and maintain the arrangements on an ongoing basis. The CER recognises that there is a practical limit to the amount of information that can be logically presented in a safety case document. However, the safety case should be suitable cross-referenced (and hyper-linked where practical) to supporting internal company documents that collectively constitute the safety management system. There should also be references to the company IT systems and databases that are used for storing and analyzing safety-related data.

The assessment of the undertaking's safety case will include a detailed review of the both the safety case contents and the undertaking's safety management systems as referenced in the safety case. This process will be described in more detail in the Safety Case Assessment Manual.

