

***IGEM/GL/8 Edition 3
Communication 1776***

Reporting and investigation of gas-related incidents



*Founded 1863
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Patron: Her Majesty the Queen*

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SECTION 1 : INTRODUCTION

1.1 This Standard supersedes IGE/GL/8 Edition 2, Communication 1721, which is obsolete.

1.2 This Standard is part of a series of Institution of Gas Engineers and Managers (IGEM) publications providing practical guidance to support the Gas Safety (Management) Regulations (GS(M)R) and the Pipelines Safety Regulations (PSR). IGE/GL/8 also supports certain requirements under the Gas Safety (Installation and Use) Regulations (GS(I&U)R) and Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR). It has been drafted by an IGEM Panel appointed by IGEM's Gas Transmission and Distribution and Gas Utilization Committees, and has been approved by IGEM's Technical Co-ordinating Committee on behalf of the Council.

1.3 This Standard is for gas transporters (GTs), gas conveyors and suppliers, consumers, gas operatives and others and covers reporting and investigating incidents and dangerous occurrences (including gas fittings found to be dangerous) associated directly with the supply and use of fuel gases.

Note: Later references to GT's responsibility, equally applies to a gas conveyor.

1.4 The principles of sound health and safety management need to be taken into account to ensure the gas system can be constructed, operated and maintained safely and effectively.

Guidance on such principles is set out in HSG65.

1.5 The relevant parts of IGE/GL/8 may be cited in a GT's safety case.

1.6 This Standard makes use of the terms "must", "shall" and "should" when prescribing particular procedures. Notwithstanding clause 1.7:

- the term "must" identifies a requirement by law in Great Britain (GB) at the time of publication
- the term "shall" prescribes a requirement which, it is intended, will be complied with in full and without deviation
- the term "should" prescribes a requirement which, it is intended, will be complied with unless, after prior consideration, deviation is considered to be acceptable.

Such terms may have different meanings when used in legislation, or Health and Safety Executive (HSE) Approved Codes of Practice (ACoPs) or Guidance, and reference needs to be made to such statutory legislation or official guidance for information on legal obligations.

1.7 Notwithstanding clause 1.6, this Standard does not attempt to make the use of any method or specification obligatory against the judgement of the responsible engineer. New and improved practices may be adopted prior to this Standard being updated. Amendments to this Standard will be issued when necessary, and their publication will be announced in the Journal of the Institution and other publications, as appropriate.

1.8 The primary responsibility for compliance with legal duties rests with the employer. The fact that certain employees, for example "responsible persons", are allowed to exercise their professional judgement does not allow employers to abrogate their primary responsibilities. Employers must:

- have done everything to ensure, so far as it is reasonably practicable, that "responsible persons" have the skills, training, experience and personal qualities necessary for the proper exercise of professional judgement

- have systems and procedures in place to ensure that the exercise of professional judgement by “responsible persons” is subject to appropriate monitoring and review
- not require “responsible persons” to undertake tasks which would necessitate the exercise of professional judgement that is not within their competence. There should be written procedures defining the extent to which “responsible persons” are asked to undertake tasks which deviate from this, they should refer that matter for higher review.

1.9 It is now widely accepted that the majority of accidents in industry are in some measure attributable to human as well as technical factors in the sense that people’s actions initiated or contributed to the accidents or people might have acted better to avert them.

It is therefore necessary to give proper consideration to the management of these human factors and to the control of risk. To assist in this, it is recommended that due cognizance should be taken of HSG48 and HSG65.

1.10 Requests for interpretation of this Standard in relation to matters within its scope, but not precisely covered by the current text, should be addressed in writing to Technical Services, IGEN, IGEN House, High Street, Kegworth, Derbyshire, DE74 2DA or by e-mail to technical@igem.org.uk and will be submitted to the relevant Committee for consideration and advice, but in the context that the final responsibility is that of the engineer/responsible person concerned. If any advice is given by or on behalf of IGEN, this does not relieve the engineer/responsible person of any of his or her obligations.

1.11 This Standard was published in December 2014.

SECTION 2 : SCOPE

2.1 LEGISLATION

Relevant legislation addressed by this Standard is:

- Health and Safety at Work etc. Act (HSWA)
- Environmental Protection Act (EPA)
- Gas Safety (Installation and Use) Regulations (GS(I&U)R)
- Gas Safety (Management) Regulations (GS(M)R)
- Pipelines Safety Regulations (PSR)
- Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR)
- Control of Major Accident Hazards Regulations (COMAH).

The legislation listed above covers a number of different fuel gases either specifically or generally.

The devolution of power to the Scottish, Welsh and Northern Ireland Assemblies means that there may be variations to the legislation described below for each of them and consideration of their particular requirements needs to be made.

2.2 SUBSTANCES

2.2.1 This Standard primarily addresses Natural Gas (NG) (in either gaseous or liquid state).

The items of legislation under Sub-Section 2.1 do not have similar scopes with respect to gases covered. For example, GS(M)R address NG only whereas GS(I&U)R cover virtually all fuel gases. As the legislation listed covers NG, this Guidance applies in full for NG.

The intent is to also provide appropriate requirements for Liquefied Petroleum Gas (LPG) which is not covered by, for example, GS(M)R. However, for most issues, the requirements (as opposed to the legislation) are the same for LPG as for NG. Where there is a difference, LPG is mentioned specifically.

2.2.2 For gases other than NG and LPG, for example LPG/air, landfill or biogases, the majority of this Standard is appropriate but due account may need to be taken of differences in gas properties and legislative requirements.

2.3 INCIDENTS

2.3.1 General

For the purposes of this Standard, "incidents" and "dangerous occurrences" are often termed collectively as "incidents".

This Standard covers the reporting and investigation of incidents and dangerous occurrences associated directly with the supply and use of gas (see Sub-Section 2.2).

2.3.2 This Standard covers onshore incidents:

- on gas supply networks, for example loss of gas or ingress of water
- on gas storage sites, for example loss of gas

- on any gas pipework/appliances involving explosions that cause damage to life and/or property
- involving carbon monoxide (CO) poisoning arising from the burning of gas.

2.3.3 With respect to RIDDOR, this Standard covers onshore:

- dangerous occurrences - Reg 7 and Schedule 2
- gas incidents causing death or major injury – Reg 11(1)
- gas fittings found to be dangerous – Reg 11(2).

2.3.4 All pressures are gauge pressures unless otherwise stated.

2.3.5 Italicised text is informative and does not represent formal requirements.

2.3.6 Appendices are informative and do not represent formal requirements unless specifically referenced in the main sections via the prescriptive terms “must”, “shall” or “should”.

.....

SECTION 3 : REPORTING METHODS AND IDENTIFICATION OF TYPES OF INCIDENT

All details provided in this section were correct at the time of publishing and are provided here for completeness. It is important that the reader checks the current status of relevant legislation at the time of reporting.

Incident reports sent to HSE will be covered by Data Protection and Freedom of Information legislation. While an investigation of an incident and/or a prosecution by HSE is in progress, no information (other than that required by the defence solicitors) will be released. Once the investigation/prosecution is completed, HSE is generally obliged to release as much information as it can. However, where a company has provided a report to HSE, then HSE would first have to check with that company whether it would allow the release of the report to the person/organisation requesting the information.

3.1 GENERAL

3.1.1 Requirements on carrying out investigations into the causes of incidents are given in Section 4.

Note: Guidance can also be found by reference to HSG245.

3.1.2 GTs are responsible for the investigation of any fire or explosion resulting from a gas escape from a gas fitting downstream of an emergency control valve (ECV). The scope of the investigation has to be sufficient to identify, as far as reasonably practicable, whether the gas escape was from installation pipework or from an appliance and, if the latter, which appliance.

3.1.3 Gas suppliers are responsible for initiating investigations of incidents involving death, loss of consciousness or taking to hospital of a person or major injury as a result of CO poisoning.

3.1.4 Recognised good practice in managing safety involves the sharing of information about accidents and incidents so that the most effective action can be taken to try to prevent their recurrence. Advice is given within clause 4.1.2 on sharing information.

3.1.5 There also has to be a system for reporting and investigating "near miss" incidents.

3.2 STATUTORY REPORTING – RIDDOR, GS(M)R AND COMAH

3.2.1 General under RIDDOR

INDG453 provides some information on RIDDOR and how to report. Further guidance is provided at <http://www.hse.gov.uk/riddor/who-should-report.htm>.

3.2.1.1 The statutory requirements for the reporting of accidents, injuries, diseases and incidents are set out in RIDDOR.

3.2.1.2 RIDDOR requires employers, self employed people or those in control of work premises to report certain work related accidents, diseases and dangerous occurrences.

RIDDOR also places duties to report certain gas-related incidents that may not be work related:

- on (GTs) (conveyors), fillers, importers or suppliers who, when notified either directly or indirectly that someone has died, lost consciousness, or been taken to hospital for treatment to an injury arising in connection with

injury which has occurred as a result of the gas they distributed, filled, imported or supplied, to notify HSE without delay and provide a report online within 14 days

- on any “member of a class of persons” (known as a Gas Safe registered gas engineer) who, if they have reason to believe that any gas fitting (as defined by GS(I&U)R), or flue or ventilation used in connection with that gas fitting is considered dangerous to the extent that people could die, lose consciousness or be taken to hospital. This may be due to the design, construction, installation, modification or servicing and could result in:
 - an accidental leakage of gas
 - inadequate combustion of gas
 - inadequate removal of products of combustion of gas and

any such occurrence is to be reported online within 10 days.

Note: Under GS(I&U)R, a business or self-employed person who carries out “work” has to be a “member of a class of persons” registered with Gas Safe Register.

3.2.1.3

Reports are required to be made to HSE, by the “responsible person” (as defined in RIDDOR).

Ways to report an incident at work are online at www.hse.gov.uk/riddor/report.htm.

The appropriate online report forms are listed below. Completing the form online submits it directly to the RIDDOR database. A copy is returned to the originator for their records:

- report of an injury
- report of a dangerous occurrence
- report of an injury offshore
- report of a dangerous occurrence offshore
- report of a case of disease
- report of flammable gas incident
- report of a dangerous gas fitting.

If there are problems accessing a form, this may be due to the (Internet) security settings on the computer or device that is being used.

Telephone

All incidents can be reported online but a telephone service remains for reporting fatal and major injuries only – by calling the Incident Contact Centre (ICC) on 0845 300 9923 (opening hours Monday to Friday 8.30 am to 5 pm).

Reporting out of hours

HSE and local authority enforcement officers are not an emergency service. More information on when, and how, to report very serious or dangerous incidents, can be found by visiting the HSE out of hours webpage. Less serious incidents out of normal working hours, can be reported online using the appropriate form.

Dangerous occurrences in shops or offices (excluding offices on operational sites) need to be reported to the local authority.

Where incidents are reported by telephone, or the ICC’s website, within the prescribed timescale (“without delay” for deaths, major injury and dangerous

occurrences) the responsible person is then no longer required to submit a further written report.

Any written report needs to be submitted on the appropriate copy of the online form.

Further information on submitting reports is given in Appendix 3.

3.2.2 **Dangerous occurrences and gas incidents causing death or major injury under RIDDOR**

3.2.2.1 Dangerous occurrences are required to be reported without delay (see clause 3.2.1.3).

3.2.2.2 Appendix 4 provides examples of dangerous occurrences which are particularly relevant to the gas transportation and supply industry and elaborates on how to identify them.

3.2.2.3 Where a GT receives notice of an incident involving death, loss of consciousness or taking to hospital of a person as a result of an escape of CO from incomplete combustion of gas in a gas fitting (including appliances), GS(M)R require the GT, as soon as is reasonably practicable, to inform the relevant gas supplier.

3.2.3 **Gas fittings found to be dangerous under RIDDOR**

3.2.3.1 Any registered gas engineer/installer (either a company or an individual) is required to report details, to HSE, of any gas installation which they have reason to believe is, or has been, faulty to such an extent that it could cause death, loss of consciousness or taking to hospital of a person or a reportable injury as a result of:

- accidental escape of gas or
- inadequate combustion of gas or
- inadequate removal of the products of combustion of gas.

Note: For the purposes of this Standard, "gas installation" means gas installation pipework and primary meters, including any flue or means of ventilation associated with an appliance.

Further information is provided in Appendix 6.

3.2.3.2 An installation only becomes reportable where the fault which gives rise to the danger is attributable to its design, construction, manner of installation, modification or servicing and has resulted from some active operation upon the installation. Faults due only to the age of the installation, lack of maintenance or customer neglect are not reportable.

Note 1: HSE's complaint procedure can be utilised if a lack of maintenance by a landlord is considered serious, but not reportable. HSE's local office can be contacted to instigate this procedure.

Appendix 6 provides further guidance on what is, and what is not, reportable. Any fault, as specified above, which has resulted in an actual incident (although not involving any death or injury and therefore not reportable as a gas incident) or which is considered to be so serious that the installation, or part of it, has been disconnected on safety grounds, is also required to be reported.

Note 2: Examples of situations which HSE suggests may be reportable are given in Appendix 6.

If a report is required, clause 3.2.1.3 applies.

3.2.4 Incidents under GS(M)R

- 3.2.4.1 Although there is some overlap between GS(M)R and RIDDOR, the reporting requirements are entirely separate. Even where an incident has been reported for RIDDOR purposes, separate notification is required to be made to HSE of the intention to investigate under GS(M)R.

Note: GS(M)R only relates to Natural Gas and does not cover LPG.

- 3.2.4.2 Regs 7(12), 7(13) and 7(14) of GS(M)R specify which gas incidents the GT or gas supplier (depending on the circumstances of the incident) have to report to HSE and investigate. Incidents notifiable under Regs 7(12) and/or 7(13) have to be reported to HSE as soon as practicable in order to afford HSE the opportunity of carrying out an investigation itself. If HSE decides not to investigate an incident, the GT or gas supplier is required to carry out the investigation.

- 3.2.4.3 Reg 7(12) requires reporting and investigation of gas escapes from gas fittings in domestic premises, that is downstream of the ECV, which have resulted in fire or explosion. The investigation has to establish, as far as reasonably practicable, whether the gas leak was from installation pipework or from an appliance and, if so, which appliance.

Note: GS(M)R – Reg 7(12) only relates to gas escapes and incidents that have occurred downstream on the consumer's side of the ECV.

Where an escape of gas from installation pipework or an appliance in domestic premises has resulted in a fire or explosion, the incident is reportable under GS(M)R Reg 7(12).

An evacuation of the premises prompted by escaping gas as a result of internal pipework failure is not reportable under GS(M)R, but may well be reportable under RIDDOR.

Commercial or industrial premises may contain domestic dwellings. For example, a shop with an adjacent or above domestic flat or a school, with a caretaker's flat.

- 3.2.4.4 Reg 7(13) requires reporting and investigation of gas escapes from the network, that is upstream of the ECV, which have resulted, or were likely to result, in a fire or explosion. The investigation has to establish, as far as reasonably practicable, the source of the escape and the reason for it.

- 3.2.4.5 For guidance on reporting under Reg 7(14), reference should be made to clause 3.2.3 and Appendix 6.

- 3.2.4.6 For straightforward investigations, operators shall endeavour to provide the investigation report to HSE within 28 days of the incident occurring. However, it is recognised that the gathering of evidence and provision of details from third parties frequently takes longer than this.

- 3.2.4.7 For the more complex reports, operators should endeavour to provide a report within three months but, if this is not possible, they should inform HSE of the expected timescale.

- 3.2.4.8 Further information is provided in Appendix 5.

3.2.5 Incidents under COMAH

Where a "major accident" has occurred at a COMAH site, the Regulations require it to be reported to the competent authority. This is a joint HSE/Environment Agency (EA)/Scottish Environment Protection Agency (SEPA)/Natural Resources Wales responsibility. For gas storage sites, the usual lead authority is HSE.

An incident is a "major accident" if it:

- results from uncontrolled developments at an establishment to which the Regulations apply, and
- leads to serious danger to people or the environment, on or off site, and
- involves one or more dangerous substance as defined in COMAH irrespective of the quantity involved.

Note: A dangerous substance has to be involved for COMAH to apply. For example, a major injury to an individual due to a fall on a COMAH site would not be a COMAH "major accident", whereas, if an individual was overcome by a potentially harmful release of Natural Gas from a storage vessel, it would be a "major accident".

3.2.6 Maintenance of records

3.2.6.1 A record should be held for at least six years of all reports made to an enforcing authority.

3.2.6.2 For written reports, facsimile or e-mail notifications, records should consist of a photocopy or electronic copy of the completed report form.

3.2.6.3 For telephone notifications, a written note should be prepared of the message given, the person receiving it, the date and time of the message and the unique identification number given by the recipient. This note should be retained as the record of the notification.

3.3 NON-STATUTORY REPORTING

Notwithstanding Sub-Section 3.1, and as a matter of good safety management practice in any company or organisation, all incidents involving injury or damage and any near misses should be subject to investigation and the findings recorded irrespective of whether they have to be reported (as in Sub-Section 3.1) to external authorities.

Note: It is recommended that the scale and detail of such investigations be based on the potential consequences of the incident, not just the actual outcome.

The information so obtained is important for the proper implementation of a safety management system as recommended in HSG65.

SECTION 4 : INVESTIGATIONS

4.1 ARRANGEMENTS FOR INVESTIGATIONS

4.1.1 Incident investigation policy

- 4.1.1.1 Any GT or supplier shall have a clear policy setting out the overall arrangements for incident investigations, covering incidents involving employees and contractors as well as the incidents dealt with in this Standard. The policy should make reference to more detailed arrangements, for example the company's safety management system covering management responsibilities, the identification of what types of incident are to be investigated and the resources to be applied to the investigation.

Note: IGEM maintains a register of consultants, many of whom are able to provide investigation services.

- 4.1.1.2 Before any investigation that is required by GS(M)R begins, the person who causes it to be carried out must notify HSE of the intention to do so and, on completion, must ensure that a report of the investigation is sent to HSE.

4.1.2 Safety management system

- 4.1.2.1 The safety management system shall describe arrangements for notifying, reporting, recording and investigating incidents (including those which may be described as "near misses").

- 4.1.2.2 The roles of senior management, safety committees, company safety departments and other agencies involved in incident investigation and analysis should be clearly defined.

- 4.1.2.3 Incidents that are investigated shall be dealt with by a competent and suitably authorised person. Therefore, persons required to undertake such investigations shall be formally nominated or appointed for those tasks and have the necessary training, skills and experience in investigation techniques.

- 4.1.2.4 Arrangements shall be in place for appropriate levels of management to be made aware of the circumstances surrounding incidents that require action (for example technical, organisational or policy changes) in order to prevent recurrence and to enable the effective dissemination of lessons learnt.

- 4.1.2.5 Procedures should address the arrangements for co-operation with others who may also be carrying out an investigation of an incident for their own purposes, for example the Police, Fire Authorities, HSE and insurance companies.

Note 1: There are good reasons for organisations with an interest in any incident to undertake their own investigations. However, in all but trivial cases, the enforcing authority (under HSWA) may exercise its powers and be responsible for the conduct of the investigation.

Note 2: HSE inspectors do not have the necessary powers to take manslaughter prosecutions, which may result from an investigation, and such cases would normally be referred to the Police.

Note 3: In cases of fire and explosion, the Fire Authorities have charge of an incident site until it has been made safe and the Local Authority/Council Building Control may also take charge of a site afterwards.

- 4.1.2.6 Procedures shall ensure that arrangements are in place for submitting reports of investigations to regulatory authorities, such as HSE and including the emergency services, as required.

4.1.3 Incident classification

A system should be developed to classify and categorise incidents. This will ensure a suitable response to incidents using personnel at the appropriate level and with the necessary expertise.

Note 1: For example, minor incidents with low risk potential may be dealt with at supervisor level, whereas a major incident involving death, injury or a major system failure may require a trained senior manager to lead a full and detailed investigation.

Note 2: Classification may vary from minor incidents or "near misses" to major or "very serious" incidents. Within these classifications, there may also be different categories of incident such as death or injury, fire and explosion, CO poisoning and environmental effects.

4.1.4 Objectives of incident investigation

Investigations should:

- be sufficiently thorough to establish both the immediate and underlying cause(s) of the incident – a superficial investigation will probably not identify the root cause
- be capable of dealing with all available evidence and arriving at a statement of the most likely sequence of events consistent with that evidence
- provide the basis of determining the level of risk, that is deciding on the likelihood of recurrence and the possible consequences. Emerging trends may be identified and dealt with
- enable suitable controls to be introduced to minimise or eliminate the root cause; otherwise problems may recur.

4.1.5 Targets of incident investigation

The purpose of investigations is to learn from incidents and improve the safety management in the organisation.

Many incidents, for example those with potentially more serious consequences, or those likely to attract attention, are defined in, and are reportable under, RIDDOR. These are likely to require full investigation. However, there may be a variety of "non-reportable" incidents which warrant investigation, for example those incidents likely to attract attention from regulatory authorities, for example HSE, the EA, Her Majesty's Inspector of Prisons (HMIP) etc. or from the media.

Investigations into the cause of incidents should be carried out in a structured manner to ensure evidence is not lost during the investigation. Requirements are provided in Appendices 8, 9 and 10. Investigations may involve destructive examination and testing at a later stage. Some of this evidence may be cited, again at a later stage, in litigation between various parties. The possibility of legal action should always be considered, including prosecution by HSE or others and civil litigation.

Note 1: The circumstances surrounding any incident are likely to be unique but certain categories of incident may allow a common approach, for example explosions, pipeline failures, CO poisonings, etc.

Note 2: As well as establishing the immediate and underlying cause of an incident, it may also be appropriate to scrutinise other areas, such as how the aftermath of the incident was dealt with and how the scene, plant or equipment was made safe.

4.1.6 Analysis of incident data

Records of incidents should be analysed to identify common features and trends and underlying causes of failures, so as to highlight areas of weakness in the safety management system (see clause 4.1.2).

4.2 CARRYING OUT INVESTIGATIONS

4.2.1 General

- 4.2.1.1 Following any incident, an adequate factual technical investigation should be undertaken, in order (as far as is reasonably practicable) to establish the cause.

Note: This will help to ensure that any lessons to be learned are taken into account in the future and thereby improve safety standards. In addition, if civil or criminal proceedings arise, it will also ensure that liability can be correctly apportioned. There may also be a need to review and revise published industry standards or, where appropriate, manufacturers' instructions.

- 4.2.1.2 The investigation of incidents such as explosions and CO poisonings should be conducted in phases, for example:

- an on-site investigation, when the majority of the site-specific evidence is acquired
- collection of off-site evidence, including complaints, incidents, repairs, servicing, etc.
- the interpretation of the evidence to establish the cause.

The "interpretation" part of any investigation may be carried out some time after the incident has occurred. However, the success of this phase will depend on the proper conduct of the first (on-site) part of the investigation, during which most of the evidence should be identified and recorded.

- 4.2.1.3 For any investigation to be successful, all of the available evidence should be collected and correctly documented.

In some cases, if an explosion has left the affected property in a badly damaged condition, early demolition may be necessary, meaning valuable evidence might be lost. Therefore, the investigator should be on the scene as soon as possible after the actual event has occurred, to initiate the process of collecting the available evidence.

- 4.2.1.4 In conducting the on-site phase of any incident investigation, because of the nature of the hazards which might exist, due regard shall be given to all appropriate safety precautions. The investigator and any other persons present on site will not then be exposed to any undue risk of injury as a result of their activities.

In particular, access to the immediate vicinity of the incident site and the commencement of any investigation should only be undertaken with the full knowledge and consent of the authority in control of the site and with responsibility for co-ordinating site activities, for example the Fire Authority, Local Authority and/or Council Building Control.

4.2.2 Network incidents

Requirements are given in this Sub-Section on the investigation of incidents upstream of the ECV (Network incidents), involving a network pipeline and its associated equipment.

Appendix 7 lists examples of specific areas of investigation for Network incidents. Network incidents, for the purposes of this clause, mean those not causing damage to property for which clause 4.2.3 also applies.

4.2.2.1 *General*

PSR specify additional duties for Major Accident Hazard Pipelines, for example flammable gas pipelines of maximum operating pressure (MOP) exceeding 7 bar, which include a requirement for a Major Accident Prevention Document. This should be used as the framework within which to define a pipeline incident investigation policy and the arrangements described in clause 4.1.1.

4.2.2.2 *The investigation*

The circumstances surrounding incidents may differ but the following describes those areas that should be addressed during any investigation of a pipeline incident. They include but are not limited to:

- establishing if there were any injuries or deaths
- protecting and securing the site
- making a full visual examination and recording details of any immediate evidence which may be relevant to the investigation, for example signs of impact or external damage, presence of corrosion products on any part of the pipeline and repairs. Particular attention should be paid to the alignment or relative position of different areas of damage, debris etc.
- taking a full photographic or video record of the condition of the pipeline and its immediate surroundings
- establishing who was at the scene and identifying witnesses
- recording the presence of valves, flanges, tees, insulation joints, supports, etc.
- recording all equipment manufacturers' data found, for example serial number, batch number, etc.
- establishing pipeline materials, joint types, dimensions and taking measurements of cover, pipe alignment, etc.
- recording the presence of any other services, for example telecommunications, electricity and water
- recording the presence of below-ground structures, for example cellars, tunnels and ducts, and any potential leak paths into adjacent structures/premises
- checking for any work activity or reports of third party activity in the immediate vicinity prior to the incident; finding out who was working and whether they were correctly authorised; establishing the actual procedures that were being followed at the time
- establishing the pipeline operating conditions, for example MOP and the upper and lower limits of normal operating pressure, operating temperature, and comparing with the design specification
- establishing whether there was an intervention (such as a hot tapping, grouting or a mechanical tee) in the pipeline that may have caused an incident and whether the incident occurred due to non compliance with established operating procedures, or through lack of competence or training
- checking for any changes in operating conditions, recently or immediately before the incident, for example variation in flow rates, pressure fluctuation and changes in temperature. Copies of any alarm summary sheets or logs should be made
- establishing exactly how the incident was brought to the attention of the pipeline operator. A sequence-of-events log should be prepared
- reviewing pipeline inspection and survey results, including relevant cathodic protection survey readings
- reviewing as-built/installed records, drawings, videos, etc.

- reviewing equipment build books, certification data books, pipe manufacturing records etc. and checking quality plans and inspection records, assembly procedures, hydrostatic test certificates, concession and repairs, etc.
- establishing pressure test history and examining test records
- reviewing material handling techniques and installation procedures during construction
- reviewing any repairs to the pipeline at the incident location, including the techniques used.

A8.9 shows a detailed checklist that may be used for investigating incidents involving gas escapes from network pipelines.

4.2.2.3 *Further investigation*

Where required, more detailed examinations should be carried out, depending on the nature of the pipeline incident, such as investigations into material and construction defects, third party activities, corrosion, the pipeline environment, pipeline operations and maintenance (see Appendix 7).

4.2.2.4 *Incidents resulting from third party damage*

Most third party damage is due to excavation work and the following points should be considered during the investigation:

- whether details of plant location had been requested from GT(s) by the third party
- the provision, adequacy and accuracy of information supplied to third parties
- any guidance issued relating to working in the vicinity of apparatus belonging to a GT
- any evidence of the location on site of the apparatus such as valve boxes or marker posts
- any protection measures applied to the apparatus, such as marker tape, concrete protection, etc.
- any evidence that the third party was in close proximity to apparatus, such as the presence of fine fill
- the depth and proximity of the damaged apparatus to other plant
- the suitability of information initially provided by the third party to GT(s) to identify the location and nature of the proposed works
- evidence of latent damage to electrical cables or equipment
- the existence and relevance of any third party's risk assessment and method statement for the task
- the adherence to industry working practices such as IGE/SR/18 and HSG47.

Note: Some of the above points may be useful to consider when investigating other third party damage, such as vandalism.

4.2.3 **Explosions causing damage to property**

4.2.3.1 *General*

GS(M)R cover the safe management of networks supplying gas to the general public and industrial and commercial premises. Under GS(M)R, GTs must manage and control their operation in compliance with arrangements set down in a safety case, which must have been accepted in writing by HSE. Included in the information to be provided within a safety case are the emergency response provisions for dealing with reported gas escapes and investigating explosions.