

***IGEM/GL/6 Edition 2
Communication 1747***

Permitry for the safe flow of gas



*Founded 1863
Royal Charter 1929
Patron: Her Majesty the Queen*



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Communication 1747**

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SECTION 1 : INTRODUCTION

- 1.1 This Standard supersedes IGE/GL/6 Edition 1, Communication 1631, which is obsolete.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), Gas Safety (Installation and Use) Regulations (GS(I&U)R) and the Pipelines Safety Regulations (PSR). It has been drafted by an IGEM Panel appointed by IGEM's Gas Transmission and Distribution Committee, and has been approved by IGEM's Technical Co-ordinating Committee on behalf of IGEM's Council.
- 1.3 This Standard contains requirements for all those organisations working and or maintaining pipelines, pipework and associated gas installations. It includes requirements for formal written procedures for working or maintaining a gas supply. The Standard applies irrespective of pressure and, in circumstances in which they are required, their content, preparation, approval and authorisation and monitoring of their application. Where relevant, it should be read in conjunction with HSG250 and HSG47.
- 1.4 The relevant parts of this Standard may be cited in a gas transporter's (GT's) safety case, but the Health and Safety Executive (HSE) will need to be satisfied that they are appropriate and have been properly applied in each case.
- 1.5 Terms such as maximum operating pressure (MOP) are included to reflect gas pressure terminology used in European standards.
- 1.6 This Standard makes use of the terms "must", "shall" and "should". Notwithstanding Sub-Section 1.9,
- 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 HSE ACoPs or guidance, and reference needs to be made to such statutory legislation or official guidance for information on legal obligations.
- 1.7 It is now widely accepted that the majority of accidents in industry generally are in some measure attributable to human as well as technical factors in the sense that actions by people initiated or contributed to the accidents, or people might have acted in a more appropriate manner to avert them.
- It is therefore necessary to give proper consideration to the management of these human factors and the control of risk. To assist in this, it is recommended that due regard be paid to HSG48.

- 1.8 The primary responsibility for compliance with legal duties rests with the employer. The fact that certain employees, for example “responsible engineers”, 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 is reasonably practicable, that there are no better protective measures that can be taken other than relying on the exercise of professional judgement by “responsible engineers”
 - have done everything to ensure, so far as is reasonably practicable, that “responsible engineers” 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 is subject to appropriate monitoring and review
 - not require “responsible engineers” 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 engineers” can exercise their professional judgement. When “responsible engineers” are asked to undertake tasks which deviate from this they should refer the matter for higher review.
- 1.9 Notwithstanding Sub-Section 1.6, this Standard does not attempt to make the use of any requirement 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 IGEM and elsewhere as appropriate.
- 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 to Technical Services, IGEM, IGEM House, 26-28 High Street, Kegworth, Derbyshire, DE74 2DA. Such requests will be submitted to the relevant Committee. Any advice given by or on behalf of IGEM does not imply acceptance of any liability, and does not relieve any party of their obligations.
- 1.11 This Standard was published in October 2010.

SECTION 2 : SCOPE

- 2.1 This Standard applies to permittry for the safe flow of gas, in pipelines, installation pipework and associated equipment/installations intended to convey primarily Natural Gas, a 2nd family gas as defined by BS EN 437 and includes the following types of permits:
- Non-Routine Operation (NRO)
 - Routine Operation (RO)
 - Permits to Work (PTW)
 - Other ancillary permittry for work procedures and maintenance.
- 2.2 This Standard primarily addresses Natural Gas (in either gaseous or liquid state). However, the items of legislation under Section 3 do not have similar scopes with respect to gases covered. For example, GS(M)R address Natural Gas only whereas GS(I&U)R cover virtually all fuel gases. This Standard applies in full for Natural Gas.
- 2.3 The intent of this Standard is to provide appropriate guidance for Liquefied Petroleum Gas (LPG) which is not covered by, for example, GS(M)R. However, for most issues, the guidance (as opposed to the legislation) is the same for LPG as for Natural Gas.
- 2.4 For gases other than Natural Gas the majority of this Standard is appropriate, but due account may need to be taken of differences in gas properties and legislative requirements.
- 2.5 This Standard applies to:
- gas transporters (GTs)
 - gas conveyors
 - independent gas transporters (IGTs)
 - utility infrastructure providers (UIPs)
 - meter asset managers (MAMs)
 - LPG network owners
 - independent gas users such as the Ministry of Defence (MOD), Hospitals, commercial and industrial organisations.
- 2.6 The principles contained within this Standard can be applied wherever written procedures are required and Appendices 5 and 7 provide suitable examples of templates that could be used.
- 2.7 All pressures are gauge pressures unless otherwise stated.
- 2.8 Italicised text is informative and does not represent part of a formal Standard.
- 2.9 Appendices are informative and do not represent part of a formal Standard unless specifically referenced in the main sections via the prescriptive terms “must”, “shall” or “should”.
- 2.9 Individual organisations, for example Distribution Network Owners, may have designated titles for roles, such as Responsible Engineer (RE), Network Controller (NC), Authorising Engineer (AE) and Competent Person (CP). These roles are defined in either IGEM/G/4 or Appendix 1.

SECTION 3 : LEGAL AND ALLIED CONSIDERATIONS

3.1 GENERAL

3.1.1 This Standard is set out against a background of legislation in force in the United Kingdom (UK) at the time of publication. Similar considerations are likely to apply in other countries where reference to appropriate national legislation is necessary.

3.1.2 All relevant legislation must be applied and relevant Approved Codes of Practice (ACoPs), official Guidance and referenced codes, standards, etc. shall be taken into account.

Note: Appendix 2 is relevant in this respect.

3.1.3 Health and safety legislation must be observed, especially those requirements which are concerned with the duties of employers, not only to their own employees, but also to members of the public who may be affected.

3.1.4 Unless otherwise stated, the current editions of legislation and standards apply.

3.1.5 In the absence of specific legislation, it is essential that installations are designed, constructed, installed, operated and maintained so as to be safe.

3.1.6 The legislation appropriate to any installation will depend largely upon its location. Advice will need to be sought from the relevant Authorities.

3.1.7 Where British Standards, etc. are quoted, equivalent national or international standards, etc. equally may be appropriate.

3.2 LEGISLATION

3.2.1 Health and Safety at Work etc. Act (HSWA)

HSWA applies to all persons involved with work activities, including employers, the self-employed, employees, designers, manufacturers, suppliers, etc. as well as the owners of premises. It places general duties on such people to ensure, so far as is reasonably practicable, the health, safety and welfare of employees and the health and safety of members of the public who may be affected by the work activity.

3.2.2 Confined Spaces Regulations

These Regulations apply to a whole range of confined spaces. The supplier or designers of an enclosure and equipment within it, is required to perform a risk assessment of the enclosure with respect to safe access and egress and to give clear instructions to operators on access/egress as well as to what actions to take in the event of a gas alarm occurring. Employers and the self employed should prevent entry into confined spaces unless avoidance is not reasonably practicable and unless there is a system of work which renders the work safe. They are also required to have specific emergency arrangements in place.

3.2.3 Construction (Design and Management) Regulations (CDM)

CDM place duties on clients, designers, contractors and CDM coordinators to ensure that health and safety is taken into account and managed effectively throughout all stages of a construction project.

Note: HSL144 provides an ACoP and guidance on CDM.

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3.2.4 **Control of Substances Hazardous to Health Regulations (COSHH)**

3.2.4.1 COSHH require employers to assess the health risks associated with the use of and exposure to substances which are hazardous to health. Primarily, they relate to health and safety at work but chemical data gathered for COSHH may also be useful when assessing environmental effects.

3.2.4.2 COSHH require:

- a written risk assessment prior to using substances which may be hazardous to health
- consideration to the properties, health effects and form of these substances. Various amendments have required specific attention be given to carcinogens, asthmogens and biological agents.

3.2.4.3 The 2004 amendments implement a new framework for occupational exposure limits and bring together eight principles of good practice.

3.2.5 **Dangerous Substances and Explosive Atmospheres Regulations (DSEAR)**

3.2.5.1 DSEAR are concerned with protection against risks from fire, explosion and similar events arising from dangerous substances used or present in the workplace. DSEAR require that risks from dangerous substances are assessed, eliminated or reduced. They contain specific requirements to be applied where an explosive atmosphere may be present and require the provision of arrangements to deal with accidents, emergencies etc. and provision of information, training and use of dangerous substances. DSEAR also require the identification of pipelines and containers containing hazardous substances.

3.2.5.2 DSEAR require an employer to classify Natural Gas installations into hazardous and non-hazardous areas. In particular:

- where a dangerous substance is or is liable to be present at the workplace, the employer must make a suitable and sufficient assessment of the risks to his employees which arise from that substance
- where an explosive atmosphere may occur at the workplace sufficient information is required to show:
 - those places which have been classified into zones (Regulation 7)
 - equipment which is required for, or helps to ensure, the safe operation of equipment located in places classified as hazardous
 - that any verification of overall explosion safety required has been carried out
 - the aim of any co-ordination required (Regulation 11) and the measures and procedures for implementing it.

3.2.6 **Electricity at Work Regulations (EWR)**

3.2.6.1 These Regulations apply to a wide range of electrical work, from overhead power lines to the use of office computers and batteries and include work on gas equipment using electrical energy.

3.2.6.2 The Regulations are concerned with the prevention of danger from electric shock, electric burn, electrical explosion or arcing or from fire or explosion initiated by electrical energy.

3.2.6.3 The Regulations impose duties on every employer, employee and self-employed person and require that persons engaged in electrical work be competent or be supervised by competent persons.

Note: HSR25 provides guidance on the Regulations.

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3.2.7 **Gas Safety (Installation And Use) Regulations (GS(I&U)R)**

- 3.2.7.1 GS(I&U)R are relevant statutory provisions of HSWA setting out general and detailed requirements dealing with the safe installation, maintenance and use of gas systems, including gas fittings, appliances and flues.

Note: GS(I&U)R do not apply to certain premises (see HSL56 Guidance Notes 28 and 29). However, where they do not apply, the principles of GS(I&U)R need to be applied, notwithstanding that the requirement for Gas Safe Registration need not be applied.

- 3.2.7.2 GS(I&U)R address both Natural Gas and LPG.
- 3.2.7.3 GS(I&U)R place responsibilities on those installing, servicing, maintaining or repairing gas appliances, pipework etc. as well as suppliers and users of gas.
- 3.2.7.4 GS(I&U)R define the gas supplier for both Natural Gas and LPG. HSL56 provides guidance on those definitions, in particular for the more complicated case of LPG supplied from storage vessels and from cylinders.
- 3.2.7.5 GS(I&U)R define the type of work that requires persons carrying out such work, or their employers, to be an "approved class of person". In the UK this means registration under the Gas Safe Register scheme.
- 3.2.7.6 The gas operative must check the safety of any appliance or pipework they install or work on and take appropriate action where they find faults. Where the premises are let or hired out, the landlord or hirer has special responsibilities to ensure that any operative they use for the gas fitting, service or maintenance or safety is a member of an approved class of persons (see clause 3.2.7.5) and is competent to carry out such work. If any serious fault is found, the operative must inform both the landlord/hirer, as well as the user, so that such faults can be rectified before further use. Reference shall be made to the requirements contained in the Gas Industry Unsafe Situations Procedures.
- 3.2.7.7 GS(I&U)R place responsibilities on LPG suppliers to deal with escapes of LPG. For Natural Gas, GS(M)R apply (See Sub-Section 3.2.8).

Note 1: Advice on dealing with gas escapes is contained in IGE/SR/20.

Note 2: Further advice on GS(I&U)R is provided in HSL56.

3.2.8 **Gas Safety (Management) Regulations (GS(M)R)**

- 3.2.8.1 Regulation 8 of GS(M)R places an obligation on GTs and gas conveyors not to convey gas in a network unless the gas conforms with the requirements of Part I of Schedule 3 of the Regulations except that this paragraph shall not apply where the gas is at a pressure above 7 bar.

Note: HSL80 provides guidance on GS(M)R.

- 3.2.8.2 GS(M)R place specific duties on GTs and gas conveyors, or their emergency service providers (ESPs), for dealing with gas escapes from pipes on their networks. Their primary duty is to make the situation safe. They are responsible not only for dealing with escapes from their own pipes, but also for dealing with escapes from gas fittings supplied with gas from pipes on their network. In GS(M)R, the term "gas escapes" includes escapes or emissions of carbon monoxide (CO) from gas fittings.
- 3.2.8.3 The ESP has specific duties to:
- provide a continuously staffed and free telephone service to enable persons to report gas escapes and
 - pass such reports on to the person who has the responsibility for dealing with the escape.

3.2.8.4 In addition, there are duties imposed on gas suppliers and GTs to notify the ESP should they, rather than the ESP, receive a report of an escape from the consumer.

3.2.8.5 GS(M)R require GTs and gas conveyors to investigate fire and explosion incidents upstream of the emergency control valve (ECV) and to send a report of the investigation to HSE. GTs and gas conveyors are also required to investigate fire and explosion incidents downstream of the ECV but this is limited to establishing whether the seat of the fire or explosion was in an appliance and, if so, which one, or in the meter installation or installation pipework.

Responsibility for investigating RIDDOR (see clause 3.2.13) reportable incidents as a result of an escape of CO from incomplete combustion of gas from a gas fitting, is placed on gas suppliers. HSE must be notified before such investigations commence.

Note 1: Advice on dealing with gas escapes is contained in IGE/SR/20.

Note 2: Advice on reporting and investigating gas escapes is contained in IGE/GL/8.

3.2.9 **Management of Health and Safety at Work Regulations (MHSWR)**

MHSWR impose a duty on employers and the self-employed to make assessments of risks to the health and safety of employees, and non-employees affected by their work. They also require effective planning and review of protective measures.

3.2.10 **Pipelines Safety Regulations (PSR)**

3.2.10.1 PSR provide a means of securing pipeline integrity by ensuring that a pipeline designed, constructed and operated safely. They apply to all Network pipes operated by a GT or gas conveyors. Installations can vary in size and complexity, and installation designers need to give due consideration to the operating pressure (OP) and required gas flows.

Note: HSL81 provides an ACoP and guidance and HSL82 provides guidance on PSR.

3.2.10.2 In particular, PSR require that the operator ensures no fluid is conveyed in a pipeline unless the pipeline has been designed so that, as far as is reasonably practicable, examination and maintenance may be carried out safely. PSR also require that the operator ensures that a pipeline is maintained in an efficient state, in efficient order and in good repair.

3.2.11 **Pressure Systems Safety Regulations (PSSR)**

3.2.11.1 PSSR impose duties on designers, importers, suppliers, installers and user or owners to ensure that pressure systems do not give rise to danger. This is done by the correct design, installation and maintenance, provision of information, operation within safe operating limits and, where applicable, examination in accordance with a written scheme of examination drawn up or approved by a competent person (as defined by PSSR).

3.2.11.2 Relevant fluids for the purpose of this document would be Natural Gas at a pressure of 0.5 bar and above. A pressure system would include bulk storage tanks, pressure vessels, pipelines and protective devices. Once the pressure in the pipework drops below 0.5 bar, and the user/owner can show clear evidence that the system does not contain, and is not liable to contain, a relevant fluid under foreseeable operating conditions, then that part of the system is no longer covered by PSSR. This is likely to be the case after the pressure relief valve associated with a pressure reducing valve which takes the pressure to below 0.5 barg, for example at the entry to a building.

3.2.11.3 Written schemes of examination are required where the pressure volume product exceeds 250 bar litres.

3.2.11.4 Note the special requirements placed on protective devices in such systems. PSSR also apply to pipelines and their protective devices in which the pressure exceeds 2 barg.

Note: More information is available in HSL122 and some information is presented in the HSE leaflets INDG261 and INDG178.

3.2.12 **Provision and Use of Work Equipment Regulations (PUWER)**

3.2.12.1 Work equipment has a wide meaning and includes tools such as hammers, laboratory apparatus, for example Bunsen burners, ladders, photocopiers, lifting equipment and machinery for use at work.

3.2.12.2 PUWER place duties on employers in relation to selection, suitability, maintenance, inspection, installation, instruction and training, prevention of danger and control of equipment.

Note: More information on PUWER can be found in HSL22 and leaflets INDG291 and INDG229.

3.2.13 **Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR)**

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

3.2.13.2 Other people have duties to report certain gas incidents which may not appear to be work related:

- death or major injury arising out of the distribution, filling, import or supply of NG or LPG should be reported by the conveyor for NG and the filler, importer or supplier for LPG
- dangerous gas fittings (as defined in RIDDOR) should be reported by a "member of a class of persons".

3.2.13.3 Major injuries, death and dangerous occurrences must be notified immediately, for example by telephone, to the enforcing authority by the "responsible person" as defined by RIDDOR. Reports can be made to the Incident Contact Centre by:

- telephone on 0845 300 9923
- email to riddor@connaught.plc.uk
- internet at www.hse.gov.uk/riddor or
- via a link from HSE website at www.hse.gov.uk.

3.2.13.4 It is also possible to report to the local HSE office by telephone and then follow up with a written report on the correct F2508 form within the required timescale (10 days, or 14 days for dangerous gas fittings). Other reports should be made as soon as practicable and within 10 days of the incident.

3.2.13.5 HSL73 contains detailed guidance on RIDDOR, including a full list of injuries etc. that need reporting.

SECTION 4 : REQUIREMENT FOR FORMAT AND CONTENT OF PERMITRY

4.1 NON-ROUTINE OPERATION (NRO)

4.1.1 Any planned NRO should entail the preparation and provision of a formal written procedure (an NRO).

4.1.2 In an emergency situation, where immediate action is required to prevent danger to life or property, or to safeguard supplies, the principles of the NRO/PTW processes as detailed in this Standard should be followed, but the requirement to prepare a written procedure should not hinder operations where immediate action is required. When an emergency situation has been made safe any relevant subsequent operations should be undertaken in accordance with this Standard.

4.1.3 For the purposes of this Standard, NROs are defined as those which involve:

- flow-stopping (whether by bagging-off, valve operation or any other method) on pipelines/pipework of nominal diameter exceeding 12 in/300 mm (metallic)/355 mm (PE) and MOP not exceeding 75 mbar, or on any pipeline/pipework of MOP exceeding 75 mbar and diameter above 2 in (metallic)/63 mm (PE)
- connections using encirclement fittings, on pipelines of nominal diameter exceeding 12 in/300 mm (metallic)/355 mm (PE) and MOP not exceeding 75 mbar, or on any diameter pipeline/pipework of MOP exceeding 75 mbar
- connections involving live welding on any pipeline/pipework or installation
- any other activity which could affect the normal operation of gas handling, storage and pressure controlled installations, electrical and or telemetered supplies or have an impact upon a significant part of a network supply system (see Note 2).

Reference should be made to Appendix 3.

Note 1: NROs, other than for those operations listed above, may be used wherever considered necessary.

Note 2: NROs are not required for gas services (see IGE/TD/4) of diameter up to and including 2 in (metallic)/63 mm (PE) and MOP not exceeding 2 bar.

Note 3: The Responsible Engineer may, subject to undertaking an engineering review and associated risk assessments detail alternative criteria for NRO requirements.

4.1.4 Any NRO should include as a minimum:

- reference numbers (including initiator's and network's identifier)
- location
- date/time and duration/expiry date
- objectives
- approvals, authority and circulation
- names/designations of the person in overall charge and of those responsible for site supervision or whose authority is required at any stage, for example the nominated CP or AE
- effect upon gas supplies and any storage system, pressure regulating installation (PRI) or higher pressure supply system within the system and adjoining gas supply systems

Note: Each Network should establish suitable and sufficient communication channels to enable other Networks and UIPs to establish the potential effects of the NRO on gas supplies.

- special requirements for the adjustments of storage and the pressure settings

- schematic system diagram showing all valves to be operated
- Permit to Work (PTW) requirement if appropriate
- requirements for any preliminary investigations deemed necessary, for example confirmation of materials, joint types, diameters etc. involved
- assessment of any additional hazards, for example requirements for thrust-blocks/anchorages for caps, bends, tees, etc. (or a statement that these are not required)
- work in known asphyxiating atmospheres
- work in potentially hazardous atmospheres
- work involving two or more groups of people working on the same site/apparatus
- work involving radiography
- working at heights
- lists of non-standard tools, equipment and materials to be on site and a check list of preparatory work
- list of all personnel with specific responsibilities, their site location and suitable communication links
- fully detailed step-by-step procedure for the NRO, including purging where appropriate, indicating personnel responsible and with provision for recording actions
- contingency plans for uncontrolled events
- consultation with other GTs whose systems may be affected by the work to be undertaken
- comment field for Authorising Engineer (AE)
- major supply points affected.

This list is not exhaustive.

4.1.5 Reference to standards, specifications, ACoPs, codes of practice (CoPs), method statements and work procedures should be made where appropriate.

4.1.6 A standard proforma should be used. An example is shown in Appendix 5.

4.2 ROUTINE OPERATION (RO)

4.2.1 A RO is a formal written document used to control operations that are predominately, but not exclusively associated with work on gas pipelines/pipework. They are generally required for operations on pipelines of diameter greater than 2 in/50 mm (metallic)/63 mm (PE) and up to and including 12 in/300 mm (metallic)/355 mm PE, MOP not exceeding 75 mbar. See Appendix 3.

Note 1: The Responsible Engineer may, subject to undertaking an engineering review and associated risk assessments detail alternative criteria for RO requirements.

4.2.2 Any RO should include as a minimum:

- reference numbers (including initiator's and GT's network identifier)
- location including map reference or post code
- date/time and duration/expiry date
- objectives
- approvals and authority
- names/designations of the competent person and AE