



***IGEM/G/4 Edition 2  
Communication 1763***

# ***Definitions for the gas industry***



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





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Communication 1763***

## ***Definitions for the gas industry***



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## SECTION 1 : INTRODUCTION

- 1.1 This Standard provides definitions of terms used in Institution of Gas Engineers and Managers (IGEM) Standards.
- 1.2 For the purposes of this Standard, definitions have been agreed between the relevant IGEM Committees responsible for the publication of IGEM Standards.
- 1.3 This Standard recognises inconsistency between definitions within IGEM Standards issued up to September 2009 due to the time period over which those Standards were developed. It attempts to consolidate the varied use of different terms across IGEM Standards, to provide a base for their future amendment and to represent current best practice.
- Definitions contained within such an IGEM Standard published prior to 1<sup>st</sup> September 2009 may continue to be used until such time as that Standard is made obsolete. Where an IGEM Standard published on or after 1<sup>st</sup> September 2009 does not contain definitions, this Standard applies.
- 1.4 For metering, this Standard should be read alongside IGEM/G/1 "Defining the end of the Network, a meter installation and installation pipework", whose definitions specifically have been accepted by Ofgem as definitions for metering arrangements in Great Britain. The definitions from IGEM/G/1 are replicated in IGEM/G/4 but drawings of "standard" and "legacy" designs of metering arrangements are not.
- When required, it is the intention to amend both IGEM/G/1 and IGEM/G/4 simultaneously to retain consistency.
- 1.5 This Standard is produced on CD and can be freely downloaded from IGEM's website alongside IGEM/G/1 for use on personal computer systems. In the event an update is required to any definition, an amendment will be issued which will be freely available to download from the IGEM website. This amendment will be tailored so that it can be inserted into hardcopies of IGEM/G/4. Alternatively the whole updated version may be downloaded from the IGEM website.
- 1.6 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, High Street, Kegworth, Derbyshire, DE74 2DA 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 concerned. If any advice is given by, or on behalf of, IGEM, this does not relieve the responsible engineer of any of his or her obligations.
- 1.7 This Standard was published in December 2012.

## **SECTION 2 : SCOPE**

- 2.1 This Standard is applicable to all Natural Gas systems and to liquefied petroleum gas (LPG) and LPG/air systems where appropriate.
- 2.2 All pressures are gauge pressures unless otherwise stated.

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## SECTION 3 : DEFINITIONS

### **1 in 20 peak six minute design criterion**

Maximum demand for gas that will occur, on average, in not more than 1 winter in 20 years. This is defined as an average in any period of six minutes, expressed as an hourly rate.

### **1 in "n" annual demand**

Annual gas demand which, in a long series of years, would be exceeded only once in a specified number of years.

### **1 in "n" load duration curve**

That curve which, in a long series of years, with total load held at the levels appropriate to the year in question, would be such that the volume of demand above any given demand threshold (represented by the area under the curve and above threshold) would be exceeded in one out of "n" years.

### **accuracy class**

Range of values that define performance accuracy, typically of a regulator.

### **accuracy group**

Range of values that define performance accuracy, typically of a slam-shut valve (SSV).

### **active regulator**

Regulator that, normally, controls outlet pressure.

### **additional emergency control valve (AECV)**

The AECV is a valve, not being the emergency control valve (ECV), for shutting off the supply of gas in an emergency, intended for use by a consumer of gas.

*Note 1: An AECV may be located within either a meter installation or installation pipework and, as such, may not isolate all of the meter installation or consumer's pipework.*

*Note 2: An AECV does not denote the end of the Network and is always fitted downstream of the ECV. The existence of an AECV does not affect the existence of an ECV (which is always required).*

### **aeration**

Displacement of purge gas with air to create a safe working atmosphere.

### **air box**

Box fitted to a watersealed gasholder crown or main to allow access onto the gasholder without the loss of air contained at gasholder pressure within it.

### **alignment clamps**

Clamps used to hold pipes in the correct position prior to welding or heat fusion.

### **alternating pilot**

Pilot for lighting a main burner that is extinguished at the end of the main burner ignition period and is re-ignited immediately before the main burner is shut-down for control purposes.

### **ambient temperature**

Environmental temperature.

### **anaerobic sealant**

Chemical compound used for joint sealing, where setting (curing) takes place in the absence of oxygen.

### **analogue failure**

Failure mode whereby a reed switch attains an electrical resistance of between a few hundred ohms to a few hundred thousand ohms, rather than being an open circuit or a short circuit.

**anchor block**

Concrete block (with or without reinforcement), used for anchorage.

**anchorage**

Fixing of pipe ends, bends and tees to prevent movement.

**ancillary permitry**

Permit for working that is usually part of routine operations, such as a regular work process or maintenance procedure that requires permission to carry it out from the Line Managers or Engineers.

**annulus**

Space between a carrier and a sleeve.

**appropriate fitting**

A fitting which:

- has been designed for the purpose of effecting a gas tight seal in a pipe or other gas way and
- achieves that purpose when fitted and
- is secure, so far as is reasonably practicable, against unauthorised opening or removal.

**asset**

Gas system including the personnel, property, plant and equipment.

**associated apparatus**

Electrical apparatus in which the circuits are not all intrinsically safe but which contains circuits that can affect the safety of intrinsically safe circuits connected to it.

**audit**

Systematic assessment of the adequacy of a management system.

**auger**

Drilling tool with a cutting head and spiral flighting along which cuttings pass or are retained to clear the borehole produced.

**authorised person**

Person, appointed in writing by the responsible engineer who has been properly instructed in his or her duties and deemed competent.

**authorising engineer (AE)**

Engineer appointed to approve permitry.

**automatic burner**

Burner for which, when starting from a completely shut-down condition, the start-gas flame is established and the main gas safety shut-off valves (SSOVs) are activated without manual intervention.

**automatic isolation valve (AIV)**

Valve which closes automatically in response to an external signal.

**auxiliary**

Device or system, such as a pilot regulator, which powers or controls main equipment.

**auxiliary energy supplies**

All forms of motive power supplying an installation, excluding fuel.

**auxiliary fired burner, relating to a gas turbine**

Burner that is provided with all of its combustion air (oxygen) requirements from an air fan independent of the turbine.



**back reamer**

Cutting head attached to the leading end of a drill string to enlarge the pilot bore diameter during a pull-back operation to enable the product pipe to be installed.

**badged meter**

Gas meter which has been stamped and/or approved by the Office of Gas and Electricity Markets (OFGEM) or other metrological authority acceptable to OFGEM, as legal metrology and which operates within prescribed statutory limits.

**bag-stop**

Technique of stopping off the flow through a pipeline, by inserting and inflating bags in the pipeline.

**balanced compartment**

Plant room or enclosure for one or more gas appliances, specifically designed to draw its combustion air from a point at which the combustion products are discharged, the inlet and outlet being so disposed that wind effects are substantially balanced.

**barholing**

Practice of safely driving a purpose-designed tool through the ground surface to a prescribed depth for the purpose of taking gas concentration measurements.

**base conditions**

Standard conditions of temperature, pressure and compressibility, to which gas is converted to account for the measurement conditions of those values.

*Note: In the United Kingdom (UK), metric standard conditions are applied as base conditions.*

**bent sub**

Short coupling placed in a drill string to intentionally change the direction or angle of the borehole.

**black start**

Worst case start condition when a compressor starts with near atmospheric pressure on its outlet.

**blast shield**

Flat plate used to prevent injury from flying debris or fire due to the explosive effects of a utility strike in a borehole.

**block and vent**

Single flow stopping device, for example a single seat valve, with a vent point in the downstream section to be isolated.

**blowing indicator**

Equipment fitted to show that a low pressure gasholder has been over-inflated.

**borehole**

Circular hole of any pre-determined diameter and direction formed in any geological formation or man-made material by rotary or percussive drilling tools, jetting or impact moling techniques.

**bottom curb, relating to a watersealed gasholder**

Metal stiffening ring which provides mechanical strength at the bottom of the outer lift.

**branch**

Connection, usually at right angles, often to a larger pipeline.

**breather line**

Line between a device and atmosphere to equalise the pressure on the detector element when it changes its position in normal operating conditions.

**breather membrane**

Sheet membrane that is waterproof but permeable to water vapour, to protect and waterproof a building prior to cladding being completed and to provide a second line of defence against any wind driven rain which may penetrate the cladding.

**burner**

Single or group of flame ports ignited as a single entity.

**butt fusion**

Method of jointing PE pipes and fittings, where the two pipe ends are heated and brought together to be fused without the use of a separate fitting or filler material.

**butt welding**

Method of jointing steel pipes and fittings of similar outside diameter, by bridging the gap between them with successive deposits of weld metal.

**by-pass**

Arrangement of valved pipework around a whole installation (or part thereof) that provides temporary continuity of supply and where necessary, control.

**cable strike**

Hitting a below-ground, live, electrical cable.

**capacity**

Maximum flow rate through an installation or item of equipment at which the installation/equipment will remain within its design parameters.

**capstone**

Slab on top of a U-duct terminal.

**caravan holiday home**

A transportable leisure accommodation vehicle designed to comply with BS EN 1647 for temporary or seasonal occupation but that does not meet all legal requirements for the construction and use of road vehicles but which retains means of mobility.

**carriages**

Guide roller housings attached to the lift or tank of a watersealed gasholder.

**carrier**

Existing pipe into which another pipe is inserted.

**case length**

Axial distance along a pipeline over which risk is assessed.

**casing**

Lengths of screwed tubing inserted into a borehole to prevent the hole caving in or to prevent loss of drilling fluid to the surrounding formations.

**catastrophic failure**

Rupture or failure of a process vessel, pipe, component and similar rare events that are not predictable.

**cathodic protection (CP)**

Method of inhibiting corrosion of buried metallic plant by ensuring that it is permanently cathodic, i.e. electrically negative, to the electrolyte in the surrounding soil.

**cavity, relating to a timber-framed building**

Drained and ventilated, or vented, space between the external cladding and the face of a timber wall panel.

**central bulk storage vessel**

Permanently installed container of approved design for the storage of fluid and which is filled on site.

**check meter**

Meter used for energy management purposes, that is not used for external billing purposes.

**check valve**

Valve, typically of the swinging plate type which does not guarantee 100% reverse flow shut off.

**chimney**

Structure consisting of a wall or walls enclosing a flue or flues.

**chimney/flue terminal**

Device fitted at the flue outlet to allow or assist products of combustion to escape, minimise down draught and prevent entry of material which might block the flue.

**chimney system**

Complete assembly of components that form a flue path from one or more appliances to a flue outlet.

**closed at rest regulator**

Design of regulator in which the internal flow control element(s) is designed to be in the closed position when all control and sensing connections are removed.

**closed position indicator switch**

Switch fitted to a safety shut-off valve (SSOV) which indicates when the SSOV is in the normally-closed position.

**closing time**

Time taken between commencing and completing the closing action of an internal valve element.

**collar**

Fitting used to join together the plain ends of two pipes.

**column guides**

Steel or cast iron sections attached to the inner face of watersealed gasholder columns on which carriage wheels run.

**column-guided gasholder**

Watersealed gasholder in which the movement of the lifts is constrained by an external framework designed to withstand the forces acting on the gasholder.

**combustion chamber**

That part of a plant in which the main combustion of gas takes place.

**commissioning**

Initial start-up of plant and equipment resulting in safe, reliable and efficient subsequent operation.

**communal flue system (CFS)**

Fabricated chimney which removes combustion products and usually supplies air to gas fired appliances fitted to the system.

**compartment**

plant room or enclosure for one or more gas appliances, specifically designed to draw its combustion air from a point at which the combustion products are discharge.

**competent person**

Person having the ability, appropriate training, knowledge and experience to supervise or carry out work being undertaken in a safe and proper manner.

**condensate drain**

Fixture in a chimney or appliance (resistant to corrosion from condensate formed from the products of combustion) where condensate can be drained.

**condensate pipework**

Pipework which may also be part of the chimney (resistant to corrosion from condensate formed from the products of combustion), which is leak-free, and along which condensate may flow.

**condensing appliance**

Appliance designed to make use of the latent heat from water vapour in the combustion products by condensing the water vapour within the appliance.

**constant mass flow vent**

Vent from which mass flow rate is controlled at a constant level for as long as practicable.

**consumer**

End-user of gas.

**continuity bond**

Electrical connection made between two sections of a pipeline or pipework prior to and during their temporary severance, to prevent sparking from stray currents or static electricity.

**continuous grade of release**

Release which is continuous or is expected to occur frequently or for long periods.

**contractor**

Persons, firm, company or authority carrying out work on behalf of the promoter of works.

**control device**

Valve or component which regulates the supply of fuel, air, products of combustion and process throughout.

**control pipework**

Pipework that transmits a control function.

**controlled interface**

System interface where gas pressure and/or flow is continuously controlled.

**controlled vent area**

Area around a temporary vent stack bounded by a contour which may be subject to restricted personnel access and is covered by operational procedures.

**conversion device**

Device using electronic circuitry that computes and indicates the volume, at standard conditions, of gas that has passed through a gas meter installation, and using as inputs the volume at measurement conditions as measured by a gas meter and other parameters such as temperature and pressure.

**conversion device type 1**

Conversion device including fixed transducers for temperature and pressure that are not field-interchangeable.

**conversion device type 2**

Conversion device with field interchangeable transducers for temperature and pressure.

**conversion system**

System comprising a conversion device or a flow computer, a pressure transducer and a temperature sensor.

**converted index**

Index reading displayed on a conversion device which shows the result of a conversion of the unconverted index to standard reference conditions.

**corrosion allowance**

Additional wall thickness provided where corrosion or erosion is expected to be of significance during the life of a system.

**cranking**

Rotation of an engine, or part of the engine, prior to ignition.

**creep, relating to a material**

Deformation of material over time, under constant stress.

**creep, relating to gas control equipment**

Minor leakage volume of gas which a regulator or other control unit may let by in its normally closed state.

**creep relief**

Means of relieving over-pressure caused by regulator let-by or creep.

**critical pipework**

Pipework that provides a primary safety, sensing or control function.

**cross duct**

Duct bringing air for combustion from outside the property to the primary inlet of a SE-duct.

**crossing**

Installation in which the primary purpose is to provide one or more passages beneath an obstruction.

**crown**

Sheet metal top of a watersealed gasholder.

**cup, relating to a watersealed gasholder**

U-shaped seal at the bottom of a lift which allows a watersealed connection to be made to the next lift.

**cup blocks (or dip blocks), relating to a watersealed gasholder**

Spacers placed in the bottom of a cup or under a dip to provide a bearing surface for the adjacent lift to be raised.

**cup level indicators**

Equipment for measuring the depth of water in a watersealed gasholder cup.

**cupping (and uncupping), relating to a watersealed gasholder**

Action of engaging (and disengaging) the lifts of a gasholder in the tank water, which ensures that an adequate gas tight seal is maintained at all times.

**cut off plate (sealing plate, hanging seal, safety seal)**

Plate which alights on the outlet main as a watersealed gasholder descends, to prevent over-extraction of gas.

**cutting head/cutter head**

Any tool or system of tools on a common support, which excavates at the face of a bore.

**cutting samples**

Cold cutting of small discs to assess metal thickness.

**cut-out**

Section of pipeline to be isolated for replacement or repair, or the installation of an in-line tee to extend supplies.

**cyclic volume**

Typical volume per revolution of a diaphragm meter.

**cylinder**

Container of approved design for the storage of a fluid and which is removed from site for filling.

**danger**

Liability or exposure to harm; a thing which causes peril.

**dangerous dose**

Specified dose which results in: "severe distress to almost everyone; a substantial fraction (of people exposed to it) requiring medical attention; some people (exposed to it) are seriously injured requiring prolonged treatment; any highly-susceptible people (exposed to it) might be killed".

**dangerous occurrence**

Event arising out of or in connection with work, which is reportable under the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) and may or may not have resulted in injury.

**dangerous substance**

Specific term defined in the Control of Major Accident Hazard Regulations (COMAH) referring to listed substances.

**demand activated governing**

Form of pressure regulating installation (PRI) specifically designed to adjust automatically its set-point within pre-determined limits in sympathy with demand variations.

**dense traffic**

Generally means traffic on a high density traffic route but, where specific constraints apply which creates traffic congestion, a lower traffic density may result in the road being classified as carrying dense traffic at full capacity.

**design brief**

Brief provided by a client to define the requirements of work.

**design factor**

Stress safety factor used in pipe wall thickness calculations.

**design flow rate, relating to network design**

Maximum flow rate that can occur over any continuous six minute period, expressed as an hourly rate.

**design maximum incidental pressure (DMIP)**

Maximum pressure a system is permitted to experience under fault conditions, limited by safety devices, when the system is operated at design pressure (DP).

**design minimum pressure (DmP)**

Minimum pressure that may occur at a point (for example at the end of a service) at the time of system design flow rate under extreme gas supply and maintenance conditions.

**design pressure (DP)**

Pressure on which design calculations are based.

**design temperature**

Temperature on which design calculations are based.

**dew point**

Temperature at which water or other vapour present in a gas condenses.

**diagnostic check**

Check which provides evidence of the condition and performance of equipment.

**diaphragm meter**

Positive displacement meter in which the measuring chambers have deformable walls.

**differential strength regulator**

Regulator in which some of the pressure-containing parts have design pressure (DP) less than the upstream maximum operating pressure ( $MOP_u$ ).

**dilution purging**

Purging to a specified end-point with maximum mixing of incoming and outgoing gases.

**dilution ventilation**

Sufficient air to effectively dilute any reasonably foreseeable sustained leak to below lower flammability limit (LFL).

**dip, relating to a watersealed gasholder**

Inverted U at the top of a lift which engages with the cup to provide a gas-tight seal between the lifts.

**dip pipe**

Pipe inserted in a pipeline for removal of condensate and other liquids.

**dip pipe collar**

Collar with integral boss, designed to accommodate a dip pipe.

**direct acting**

Not requiring auxiliary power for operation.

**direct purge**

Displacement of air by fuel gas or vice versa.

**directional drilling**

Steerable system for the installation of pipes, conduits and cables in a shallow arc using a surface-launched drilling rig.

**displacement purging**

Purging to a specified end-point with minimal mixing of incoming and outgoing gases.

**distribution main (main)**

Pipeline through which a gas transporter (GT) is for the time being distributing gas and which is not being used only for conveying gas in bulk.

**distribution main valve (DMV)**

Valve (other than an emergency control valve (ECV) or service isolation valve (SIV)) for controlling the supply of gas, being a valve:

- incorporated in a distribution main
- intended for use by a gas transporter (GT)
- not situated in a building.

**diurnal storage**

Storage available to limit peak flow effects in a transmission system.

**diversity**

Phenomenon whereby the average demand per consumer reduces as the number of consumers considered increases.

**double block and bleed**

Two flow stopping devices (both of which may be incorporated in an individual block valve of appropriate design) with a vent between them. Also known as a block and bleed.

**double block and bleed valve/block and vent**

Two safety shut-off valves (SSOVs) in series with the intermediate space between the valves vented to near atmosphere.

**double faced and vented valve**

Valve having two sealing faces where the upstream face is capable of withstanding the line pressure from the upstream direction and the downstream face is capable of withstanding the line pressure from the downstream direction, and where the intermediate space between the sealing faces is vented to atmosphere.

**downwash**

Downwind dispersion of gas caused by vortices shed by air flow past the top surfaces or edges of structures.

**draught diverter**

Device for preventing conditions in a secondary flue from interfering with the combustion performance of an appliance.

**draught stabiliser**

Device designed to reduce the amount of natural draught available by diluting flue gases with cold air.

**drill bit, relating to boreholing**

Device attached to, or an integral part of, a drill string which is used as a cutting tool to penetrate the formation being drilled by the power applied.

**drill rig/rig**

Machine used in conjunction with the in-hole equipment to carry out directional drilling techniques.

**drill rod/pipe**

Hollow screwed tube used to transmit drill rig power to a drill bit.

**drill string**

Total length of drill rods/pipes, bit swivel joint, etc. in a drill borehole.

**drilling fluid/mud**

Mixture of water and, usually, bentonite or polymer continuously pumped to a cutting head to facilitate the removal of cuttings, stabilise the borehole, cool the head and lubricate the installation of the product.

**drive/entry shaft/pit**

Excavation from which trenchless technology equipment is launched for the installation or renovation of a pipeline, conduit or cable.

**drop-out time**

The time taken for a flame safeguard system to respond to a loss of flame.



**dry bore**

Any drilling system not employing drilling fluid in the process.

**dry gasholder**

Low pressure gasholder in which the annular space between the moving piston and gasholder side wall is completely sealed by a specifically-designed fabric seal.

**dry run**

Verification of the correct operation of components and interlocks without fuel being available to a combustion space.

**dual-fuel engine**

An engine of the spark or compression ignition type, that is capable of operating on two or more fuels.

**dual-fuel turbine**

Turbine which is equipped to enable it to operate on two or more alternative fuels.

**duct**

Encasement installed to protect a building service or to facilitate its passage through or under a structure.

**dumpling, relating to a watersealed gasholder**

Unexcavated area in the middle of a below-ground tank.

**dwelling, relating to multi-occupancy buildings**

Individual residential premises within a larger building.

**earth piercing**

Use of a tool which comprises a percussive hammer within a suitable casing, generally torpedo shaped.

**easement/servitude**

Legal instrument that conveys a right of way over another's ground or property.

**ejector**

Device that injects high pressure fluid through a jet to induce suction for the removal of another fluid.

**elastic follow up**

Refers to elastic displacement being sufficiently large that the stresses appear to be load-controlled even though distortion has occurred.

**elastomeric**

Generic term for materials such as synthetic or natural rubber.

**electrical equipment**

One or more electrical component assembled for a specific purpose.

**electrofusion**

Method of jointing PE pipe, using fittings having integral electrical heating coils.

**emergency block valve**

Valve, complete with open and closed limit switches, which closes automatically in response to an external signal.

**emergency call centre**

Designated location for receipt of telephone calls etc. relating to reported gas escapes.

**emergency control valve (ECV)**

Valve, not being an additional emergency control valve (AECV), for shutting off the supply of gas in an emergency, intended for use by a consumer of gas and being installed at the end of a service or distribution main. The outlet of the ECV terminates, and thus defines, the end of the Network.

**emergency service**

Fire, ambulance, police etc, emergency services.

**emergency service provider**

Person who is appointed and acts on behalf of a person conveying gas to prevent an escape of gas.

**emergency vent valve**

Valve, complete with open and closed limit switches, which opens automatically in response to an external signal.

**encapsulation**

External leakage repair method for joints.

**encirclement fitting**

Two-part fittings installed around pipe jointed together longitudinally, and jointed to the pipe circumferentially at each end.

**enclosed space**

building: enclosure which by design allows people to enter, characterised by the presence of a roof and may have any number of walls including none at all. The notional width and length of a building takes into account the opening of doors and windows, etc., where these open outwards. A building may contain one or more rooms.

bund: open-topped enclosure around plant or tanks containing liquid, formed by the erection of walls or banks to contain leakage or spillage of flammable liquid.

compartment: plant room or enclosure for one or more gas appliances, specifically designed to draw its combustion air from a point at which the combustion products are discharged.

cubicle: enclosure, normally used for housing instrumentation and, generally, large enough to permit complete bodily access.

duct: nominally horizontal open or covered enclosure, in the ground or in a building, for the distribution of services.

pit: enclosure below ground or floor level.

shaft: nominally vertical open or covered enclosure for the distribution of services.

**energy sources**

All fuels and all forms of motive power supplies.

**equipotential bond**

Electrical connection maintaining various exposed conductive and extraneous conductive parts at the same potential.

**equivalent stress**

Value of stress calculated from the equation developed by von Mises defining the criterion of yield using the principal stresses or individual stresses.

**essential load**

Load or part of a load that a consumer cannot tolerate being turned off for any reason.

**event tree**

Provides a systematic way of identifying all of the possible outcomes from a hazardous event.

**excess flow valve (EFV)**

Valve, selected to close at a pre-determined flow, intended to prevent gas from escaping in dangerous quantities once the integrity of the gas system downstream of the EFV has been significantly breached.

**expander**

Tool which enlarges a bore of a pipe, for example during a pull-back operation by compression of surrounding ground rather than by excavation.

**expansion joint**

Fitting or a jointing method used to counteract the effects of thermal expansion of steel pipes.

**explosive gas atmosphere**

Mixture with air, under atmospheric conditions, of flammable substance in the form of a gas or vapour, which, after ignition, permits self-sustaining flame propagation.

*Note: Although a mixture which has a concentration above the upper explosive limit (UEL) is not an explosive gas atmosphere, it can readily become so and, in certain cases for area classification purposes, it is advisable to consider it as an explosive gas atmosphere.*

**external cladding, relating to timber frame buildings**

Outer face of a wall of a building.

**external connections**

All electrical and mechanical (including pipe) connections to a component.

**external riser**

Riser attached to the outside of a building or concealed in an external reveal.

**extra high level knock-off**

Separate device fitted to a low pressure gasholder which will shut off the gas input if the high level knock-off fails to operate for any reason.

**extra low level knock-off**

Separate device which will stop gas export from a low pressure gasholder if the low level knock-off fails to operate for any reason.

**fail-safe system**

System where loss of power or actuating fluid to any control element, or its failure to operate when energized, leads to a safe condition.

**fall-open regulator**

Regulator biased to the open position when de-energised (usually when a control or sensing connection is broken).

**fan diluted flue system**

Fanned draught open flue system in which products of combustion are diluted with air to an agreed lower concentration.

**fanned draught flue system**

System in which removal of combustion products is dependent on a fan.

**filter**

Device to collect dust, debris, etc which may be present in a flowing gas stream.

**filter inlet valve (FIV)**

Valve fitted upstream of, and adjacent to, a filter to shut off the supply of gas.

**filter outlet valve (FOV)**

Valve fitted downstream of, and adjacent to, a filter to shut off the supply of gas.

**fixed factor conversion**

Means of converting metered gas consumptions from actual conditions to reference conditions by means of a multiplying factor which takes account of temperature and/or pressure (including compressibility) and which is based upon the assumed constant metering temperature and/or pressure (including compressibility), as appropriate.

**flame detector**

That part of a flame safeguard which is responsive to flame properties and signals the presence of flame.

**flame failure**

Loss of flame from the normally-detected position by any cause other than the action of de-energising the safety shut-off system.

**flame safeguard**

Control responsive to flame properties detecting the presence of flame and, in the event of ignition failure or subsequent loss of flame, causing safety shut-down and/or lockout.

**flame simulation**

Condition in which a flame detector signals the presence of flame (whether or not it exists).

**flammability limits**

lower flammability limit (LFL): Concentration of flammable gas or vapour in air, below which the gas atmosphere is not flammable.

upper flammability limit (UFL): Concentration of flammable gas or vapour in air, above which the gas atmosphere is not flammable.

*Note: Although a mixture which has a concentration above UFL is not a flammable gas atmosphere, it can readily become so and, in certain cases for hazardous area classification purposes, it is considered as a flammable gas atmosphere.*

**flooding holes, relating to a watersealed gasholder**

Holes in a cup plate which allow the cup to fill and empty with water without overflowing or gas release and enable the changes in water levels as a gasholder cups and uncups to take place more easily.

**flow computer**

Device that utilises a high frequency signal and calculates a standard cumulative flow of gas based on this signal, pre-programmed parameters and other gas properties determined by suitable transducers.

**flow straightener**

Series of plates or tubes used to remove turbulence in the combustion air or gas flow which is caused by air or gas passing through an obstruction such as a bend.

**flue**

Passage for conveying combustion products to outside air within a chimney.

**flue break**

Opening into a secondary flue in the same room as, and in addition to, the opening at a draught diverter.

**flue lining**

Wall of a chimney, consisting of components the surface of which is in contact with the products of combustion.

**flue pipe**

Pipe enclosing a flue.

**fluid assisted boring/drilling**

Guided boring technique using a combination of mechanical drilling and pressurised fluid jets to provide the soil cutting action.

**flying lift**

Inner lift of a column-guided gasholder which can rise above the guide framing.

**foaming off**

Use of expanding foam injected into a pipeline, which sets to stop the flow of gas.

**fogging**

Dispersion of micro droplets (liquid phase) of conditioning fluid in a gas stream.

**forced draught burner**

Burner in which the combustion air is provided under pressure.

**free handle valve**

Safety shut-off valve (SSOV) which, when energised, can be opened or closed by the manual operation of a handle and which, when de-energised, closes and cannot be opened by the operation of the handle.

**freely ventilated**

More than adequately ventilated.

**fuel gas**

Any combustible gas or mixture of gases.

**functional test**

Test which provides evidence that equipment is in working order.

**fusion**

Welded joints made on polyethylene (PE) systems, by the controlled application of heat and pressure.

**galvanic isolation**

Circuit incorporating electronic components and an isolating device that will provide electrical isolation between a signal input and a signal output, thus ensuring that the hazardous area equipment (usually connected to the signal output) is electrically floating relative to the non-hazardous area equipment (usually connected to the signal output).

**gas conditioning**

Process where a sealing medium is transported to joints, either in the liquid or the vapour phase, by the contained gas itself.

**gas conveyor**

Person who conveys gas through pipes and the Network and having duties under the Gas Safety (Management) Regulations (GS(M)R) and the Pipelines Safety Regulations (PSR) and who may also hold a Gas Transportation Licence.

**gas detector**

Instrument used for the detection of gas concentration.

**gas fitting**

Gas pipework, valves (other than the emergency control valve (ECV)), regulators, meters, fittings, apparatus and appliances designed for use by consumers of gas for heating, lighting, cooking or other purposes for which gas can be used, but it does not mean:

- any part of a distribution main or service (pipe)
- any part of a pipeline upstream of a distribution main or service (pipe)
- a gas storage vessel
- a gas cylinder or cartridge designed to be disposed of when empty.

**gas meter**

Instrument designed to measure, memorise and display the quantity of fuel gas (volume or mass) that has passed it.

**gas plant and equipment**

All gas-containing components, including filters, heaters, slamshut valves (SSVs), regulators, relief valves, non-return valves (NRVs), meters, valves, pilots, burners, interconnecting pipework, instruments, impulse and control lines.

**gas shipper**

Holder of a licence except where the holder is acting otherwise than for purposes connected with the carrying on of activities authorised by the licence.

**gas supplier**

In relation to gas means:

(a) a person who supplies gas to any premises through a primary meter; or

(b) a person who provides a supply of gas to a consumer by means of the filling or re-filling of a storage container designed to be filled or re-filled with gas at the place where it is connected for use whether or not such container is or remains the property of the supplier; or

(c) a person who provides gas in re-fillable cylinders for use by a consumer whether or not such cylinders are filled or re-filled directly by that person and whether or not such cylinders are or remain the property of that person, but a retailer shall not be deemed to be a supplier when he sells a brand of gas other than his own.

**gas supply point**

Final flange or service valve at the inlet to a primary meter installation.

**gas system**

System comprising a distribution main/service (pipe), emergency control valve (ECV), meter installation and installation pipework and any additional emergency control valve (AECV) to supply a consumer's appliance.

**gas tight**

Property which is attributed to a component when it stops or contains gas flow under specified conditions.

**gas transporter (GT)**

Company, licensed by Ofgem, which transports gas through its network on behalf of a gas shipper or supplier.

**gas turbine**

High speed rotating machine in which fuel is burned continuously in a combustion chamber at high pressure and the combustion products are expanded through the gas turbine to produce shaft horsepower.

**gasholder heating**

Heating that prevents water freezing in the cups of a watersealed gasholder.

**gasholder height equipment (gasholder contents gauge)**

Equipment for measuring the height of a low pressure gasholder, and from this estimating its contents.

**gasholder station**

Site where a gasholder or group of gasholders, together with the necessary control and ancillary equipment, is located.

**gauge readable movement (GRM)**

Minimum pressure change that it is possible to read on a pressure gauge.

**gauging**

Method of checking for size and suitability of pipe into which insertion is to take place.

**grades of release**

Release, which is either continuous, primary or secondary grade. See individual definitions.

**grid mat**

Metal mesh mat.

**grounded gasholder**

Position of a watersealed gasholder representing a state of complete deflation and where all lifts are supported on the rest blocks.

**guide rollers, relating to a watersealed gasholder**

Wheels (and axles) which engage with the column-guide or spiral-guide rails and transmit the forces acting on a gasholder lift to the supports.

**guided boring**

Steerable system for the installation of pipes, conduits and cables using a surface-launched drilling rig.

**hardware alarm**

Alarm operated directly by equipment installed for that purpose.

**hazard**

Situation with a potential for human injury, damage to property, damage to the environment or a combination of these.

**hazard analysis**

Identification of undesired events which leads to the materialisation of a hazard, the analysis of the mechanisms by which these undesired events could occur and usually the estimation of the extent, magnitude and likelihood of any harmful effects.

**hazard range**

Distance from the release point or source of hazard to a defined level of harm or type of hazard.

**hazard and operability study (HAZOP)**

Systematic study carried out by application of guide words to identify all deviations from design intent with undesirable effects for safety or operability.

**hazardous area**

Area in which explosive gas/air mixtures are, or may be expected to be, present in quantities such as to require special precautions for the construction, installation and use of electrical apparatus or other sources of ignition.

- Zone 0: An area in which an explosive air/gas mixture is continuously present or is present for long periods
- Zone 1: An area in which an explosive air/gas mixture is likely to occur in normal operation occasionally
- Zone 2: An area in which an explosive air/gas mixture is not likely to occur in normal operation and, if it occurs, it will exist only for a short time
- Zone 0 NE: An area in which an explosive air/gas mixture is continuously present or is present for long periods, but would be of negligible extent
- Zone 1 NE: An area in which an explosive air/gas mixture is likely to occur in normal operation occasionally, but would be of negligible extent
- Zone 2 NE: An area in which an explosive air/gas mixture is not likely to occur in normal operation and, if it occurs, it will exist only for a short time and would be of negligible extent.

**hazardous substance**

Substance which, by virtue of its properties, constitutes a hazard.

**heat recovery steam generator (HRSG)**

Boiler or other suitable equipment through which hot exhaust gases may pass en-route to a flue and in which energy, which would otherwise be wasted, may be extracted usefully.

**high-level knock-off**

Control which prevents filling of a low pressure gasholder above the agreed normal high level operating limit.

**high density traffic routes**

Include:

- (a) all motorways
- (b) all roads that carry a volume of traffic totalling, in both directions, 2000 vehicles per hour and above, for periods of at least 10 hours per week which may be spread evenly over the week or may be concentrated into set periods.
- (c) all dual multi-track rail routes with trains passing any one point, in either direction, at frequencies in excess of one every 15 minutes for a cumulative period of 8 hours in any one day.

**holiday**

Flaw in the protective coating of a pipe or component which may expose the underlying surface.

**hoop stress**

Stress in a pipe wall in the circumferential direction.

**humidification**

Introduction of water vapour into a gas stream.

**hunting**

Regulator instability when the flow rate is very low and the regulator is on the verge of lock-up, or where two regulators are installed in parallel and their set points are the same or similar.



**ignition period**

Period during which a start-gas flame safety shut-off valve (SSOV) is permitted to be open before a check is made for the presence of the start-gas flame.

**impact moling**

Use of a tool which comprises a percussive hammer within a suitable casing, generally torpedo shaped.

**impressed current**

System of corrosion protection, using an external electrical source.

**indirect purge**

Displacement of fuel gas by inert gas/fluid followed by displacement by air, or vice versa.

**individual risk**

Frequency at which an individual may be expected to sustain a given level of harm from the realisation of specified hazards, and in the case of pipelines, the frequency at which an individual at a specified distance from the pipeline is calculated to become a casualty at a specified level of harm from the realisation of specific hazards

**individual risk criteria**

Criteria relating to the likelihood with which an individual may be expected to sustain a given level of harm from the realisation of specified hazards.

**individual stresses**

Stresses along one axis in pipe/components induced by forces, bending moments and internal pressure.

**induced draught burner**

Burner into which the combustion air is introduced by providing a suction in the combustion chamber by mechanical means, usually an induced draught fan.

**inert gas**

Any gas or mixture of gases which will neither burn nor support combustion.

**initial defect size**

Maximum size of defect (or the distribution of actual sizes of defects) which could be left in an installation following a commissioning hydrostatic test.

**initiator**

Person who identifies the need for new work, modification or repair.

**injector**

air blast: Device in which gas is entrained by the action of a jet of air to produce a gas/air mixture.

atmospheric: Device in which air is entrained by the action of a jet of gas to produce a gas/air mixture.

**inlet isolation valve (IIV)**

Valve, normally not being an emergency control valve (ECV) and never installed downstream of an ECV, to enable isolation of gas to all parts of a building, by an authorised party which (usually) is not the consumer.

**inner lift (first lift or top lift)**

Inside lift of a watersealed gasholder, having the smallest diameter, and carrying the crown.

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**installation designer**

Person responsible for designing (or overseeing the design process of) an installation as a whole, and for ensuring that the design is suitable for the intended duty and that the location is appropriate.

**installation pipework**

Any pipework or fitting from the outlet of a meter installation to points at which appliances/equipment are to be connected. It does not mean:

- a service (pipe) or distribution main or other pipeline
- a pipe or fitting comprised in a gas appliance
- a pipe or fitting within a meter installation
- any valve attached to a storage container or cylinder.

**installer**

Person who organises and carries out new work, modification or repair.

**insulation joint**

Fitting having high electrical resistance, which can be inserted in a pipeline to insulate electrically one section of pipe from another.

**interlock**

Component which monitors prescribed operating conditions and ensures appropriate action if conditions deviate from the normal operating level.

**intermediate lift (middle lift(s))**

Lift(s) of a watersealed gasholder between the inner and outer lifts.

**intermediate floor panels**

Timber floor, usually located on and supported by a timber frame wall.

**intermittent pilot**

Pilot that is ignited prior to ignition of a main flame and is shut off simultaneously with it.

**internal riser**

Riser installed within the structure of a building.

**interrupted pilot**

Pilot which is ignited at each burner start-up and which is extinguished at the end of the main flame establishment period.

**interruptible supply/load**

Supply or load for which it has been contractually agreed that the consumer may be interrupted in accordance with specific terms and conditions.

**intrinsically safe or intrinsic safety (I.S.)**

Apparatus in which no spark or any thermal effect produced under prescribed test conditions (including normal operation and specified fault conditions) is capable of causing ignition of a given explosive atmosphere.

**jacking rig**

Equipment installed in a launch pit to install pipes as an excavation proceeds.

**jet, relating to venting of gas**

Stream of fluid (gas) which, on emerging from an opening (a vent stack), progressively expands as it entrains the surrounding fluid (air), and in so doing transfers momentum to it.

**jet cutting**

Type of guided boring technique using pressurised fluid jets to provide the soil cutting action.

**king post**

Resting place for the centre of the crown framework within a watersealed gasholder tank.

**laminar flow**

Where all molecules of gas in a pipe travel more or less parallel to the walls of the pipe, across the full area of a pipe, under flow conditions.

**landfill gas**

Mixture of gases produced as a result of microbial activity whenever biodegradable material is deposited in a landfill site.

**lateral**

Horizontal pipe, connected to a riser, that conveys gas along one floor level within a building.

**launch frame**

Metal frame used to hold and guide an impact mole to achieve required direction.

**launch pit**

Excavation from which an impact making tool is launched.

**leak test**

Testing of an assembly of elements that have been previously subjected to, and passed, tightness testing, intended to prove that the joints have been made properly and are free from leaks.

**leak tightness proving system**

A means of proving that a safety shut-off valve (SSOV) system is not leaking by the application of a pressure or vacuum between the SSOVs.

**leakage survey**

Systematic search for escapes of gas.

**legacy gas supply arrangements**

Gas supply arrangements (usually that have been installed prior to the publication of IGEM/G/1) and that are not consistent with the installations defined as being "recommended gas supply arrangements."

**legacy meter owner**

Gas transporter (GT) which provided a meter under licence conditions prior to the publication of IGEM/G/1 in a configuration not consistent with "recommended gas supply arrangements".

**lift**

Telescopic section of a watersealed gasholder.

**lighting torch**

Hand-held burner ignited outside a combustion chamber.

**light steel frame**

Frame structures constructed from cold-rolled galvanised steel.

**limit state**

State of an installation when it no longer satisfies a particular design requirement.

**linepack**

Storage obtainable from diurnal pressure cycling of pipelines whose capacities are not fully committed to transmission.

**live gas working**

Practice of carrying out work on, or associated with, a gas supply pipe while a release of gas is taking place.

**live run**

Verification of the correct operation of interlocks and the establishment of operating levels with fuel available to a combustion space.

**livesey seal**

Attachment to the crown of some watersealed gasholders which isolates the inlet or outlet main from any gas remaining in the gasholder.

**load, relating to metering**

Flow rate of gas required, which may be supplied in units of energy by a shipper or supplier to a consumer and then converted into actual volume per hour, or corrected volume per hour.

**load, relating to pipelines**

Forces acting on a pipeline or other components.

**locator (walkover system)**

Electronic instrument used to determine the position and strength of electromagnetic signal emitted from a transmitter sonde in the pilot head of a boring system, in an impact moling tool or from existing underground services which have been energised.

**lockout**

Safety shut-down condition of a control system such that re-start cannot be accomplished without manual intervention.

**lockout – non-volatile**

Safety shut-down condition of a control system, such that re-start can only be accomplished by a manual re-set of the system and by no other means.

**lockout – volatile**

Safety shut-down condition of a control system, such that re-start can only be accomplished by either a manual re-set of the system or an interruption of the main power and its subsequent restoration.

**lock-shut valve**

Valve that, when closed, will not re-open unless a special tool and/or key is used.

**lock-up**

Complete closure of a regulator when gas demand falls to zero.

**lock-up pressure**

Outlet pressure at which a regulator locks up.

**long range thermal stresses**

Stresses induced from axial thermal expansion of a long straight pipeline from a uniform temperature rise.

**loss prevention**

Systematic approach to preventing accidents or minimising their effects.

**lowest operating pressure (LOP)**

Minimum pressure which a system is designed to experience under normal operating conditions.

**low frequency (LF) transmitter**

Device connected to a gas meter that provides electrical pulse outputs directly proportional to the actual volume passed by a gas meter.

**low level knock-off**

Control which prevents gasholder (low pressure) discharge below a specified safe working level.

**low pressure cut-off valve**

Valve which will shut off the gas supply in the event of the gas pressure falling below a pre-determined value.

**low pressure gasholder**

Containment where a cylinder or piston is arranged to rise and fall to accommodate varying volumes of gas.

**main (for liquefied petroleum gas (LPG))**

Pipe used for distributing LPG in the vapour phase from a central bulk storage installation to more than one premises.

**main burner**

Device to generate a main flame.

**main flame**

Flame, other than the start-gas flame, on a main burner.

**main flame establishment period**

Where the main flame is ignited from a previously ignited pilot flame, the period during which gas may be admitted to the main burner before supervision of the main flame is required.

**main/common flue**

That part of a flue system carrying products of combustion from two or more appliances.

**main gas**

Gas supply to establish and maintain the main flame.

**maintenance**

Combination of all technical and associated administrative actions intended to retain an item in, or restore it to, a state in which it can perform its required function.

**major accident hazard**

Specific term defined in the Control of Major Accident Hazard Regulations (COMAH) which means an occurrence resulting from uncontrolled developments in the course of an industrial activity leading to a serious danger to persons or the environment.

**management control system**

Logical control of all operations.

**management system**

Organisation and arrangements established by a company for managing its undertaking.

**marker plate**

Plate giving details of buried gas plant.

**marker post**

Post installed close to buried gas plant, to which a marker plate is affixed.

**maximum incidental pressure (MIP)**

Maximum pressure which a system is permitted to experience under fault conditions, limited by safety devices.

**maximum operating pressure (MOP)**

Maximum pressure at which a system can be operated continuously under normal operating conditions.

**maximum permitted leak rate (MPLR)**

Maximum permitted leak rate of the operating gas at operating pressure (OP). A value fixed according to the operating fuel gas involved, the situation of the pipework and whether the pipework is new or existing.

**maximum settle out pressure**

Maximum resulting steady state pressure when a volume of gas at high pressure on the outlet of a gas compressor is connected to a defined volume at low pressure on the inlet of the compressor.

**measurement while drilling (MWD)**

Borehole survey instrumentation that provides continuous information simultaneously with drilling operations, usually transmitting to a display at or near the drilling rig.

**mechanical joint**

Joint in which gas tightness is achieved by compression with or without a seal.

*Note: A flanged joint is a mechanical joint with a seal; this joint can be disassembled and reassembled. A union joint is a mechanical joint with or without a seal; this joint can be disassembled and reassembled. A compression joint is a mechanical joint which is not normally intended to be disassembled and then reassembled.*

**mechanical trip**

Mechanically actuated device which activates one or more safety trips.

**melt bead**

Lip of PE displaced during butt fusion of pipe.

**meter asset manager (MAM)**

An organisation that works on behalf of the meter owns and is responsible for ensuring the design, installation, commissioning, maintenance, removal and disposal of gas supply meter installations is performed by suitably qualified persons or organisations in accordance with industry standards and legislation.

**meter bank**

Group of meters in the same location.

**meter by-pass**

Any pipe, and associated gas fittings used in connection with it, used to supply gas to a consumer without passing through the meter.

**meter examiner**

Person who empowered by law to break and remake a metrological seal on approved and stamped (badged) meters.

**metering point**

Point at which a gas supplier meters gas prior to transfer to the consumer supply point, downstream of any pressure reducing equipment.

**meter inlet valve (MIV)**

Valve fitted upstream of, and adjacent to, a gas meter to shut off the supply of gas.

**meter installation**

Includes a primary meter and any associated volume conversion system, valve, filter, meter regulator or pressure regulating installation (PRI), flexible connection, meter by-pass, interconnecting pipework, fitting and support.

**meter installation inlet valve (MIIV)**

Valve fitted upstream of all the other components of a meter installation to shut off the supply of gas.

**meter installation outlet valve (MIOV)**

Valve fitted downstream of all the other components of a meter installation to shut off the supply of gas from a meter installation.

**meter outlet adaptor**

Fitting which facilitates the connection of a gas consumer's installation pipework to the outlet of a meter.

**meter outlet valve (MOV)**

Valve fitted downstream of, and adjacent to, a gas meter to shut off the supply of gas from the meter.

**meter owner**

Person owning a meter and/or a meter installation (see also "legacy meter owner").

**meter pulse significance (scaling factor)**

Number of units of volume represented by each contact closure in a low frequency (LF) transmitter or a high frequency (HF) transmitter.

**meter regulator**

Device located in close proximity to a primary meter which is solely to control the pressure of the gas within the measurement device and/or installation pipework and is not separated from the measurement device by buried pipework, except short lengths specifically included in the installation design for access purposes.

**meter spool**

"Pipe section" body of an ultrasonic meter (USM) to which the transducer mountings are attached.

**meter tube**

Primary metering device, together with the requisite upstream and downstream straight lengths of pipe and including any flow conditioning device.

**microtunnelling**

Use of small diameter tunnelling machines to install underground pipes by remote control from the surface using pipe-jacking techniques.

**midi-rig**

Steerable surface-launched drilling equipment for the installation of pipes, conduits and cables. Applied to intermediate-sized drilling rigs used as either a small directional drilling machine or a large guided boring machine.

**mini-horizontal directional drilling (MINI-HDD)**

Term sometimes applied to guided boring.

**minimum allowable suction**

For each stage, the lowest pressure (measured at the inlet flange of the cylinder) below which the combined rod loading or gas suction loading or gas loading or discharge temperature or crankshaft torque loading (whichever is governing) will exceed the maximum allowable during operation at the setpoint pressure of the discharge relief valve and other specified gas conditions for the stage.

**minimum source pressure**

Pressure available at the source at the time of the system design flow rate.

**mismatch**

Dimensional irregularity of two pipes to be jointed.

**mobile dwelling**

Caravan holiday home, a residential park home or a permanently moored boat.

**modification**

Temporary or permanent physical change to any aspect to an existing installation or design.

**molecular seal**

Device designed to prevent mixing of air and gas to a flammable concentration upstream of the position of the seal.

**monitor/active (regulator)**

Arrangement of two regulating devices in series whose pressure settings are stepped so as to allow one (active) normally to control the outlet pressure and the other (monitor) to assume control in the event of failure of the active device to the open position.

**multiple vent**

System of vents whereby gas is discharged to atmosphere by simultaneous venting from two or more adjacent vent stacks.

**multi-storey**

Containing more than one storey, either above or below ground but not including a basement/cellar.

**natural draught burner**

Burner not requiring a fan or other mechanical means to supply combustion air.

**natural draught flue system**

Flue system in which the draught is provided by the thermal force arising from the heat of the products of combustion.

**near miss**

Incident arising out of, or in connection with, work which did not cause injury to any person and was not a "dangerous occurrence" but which might easily have caused an injury.

**network**

Part of the Network, a network comprises interconnecting pipes which are downstream of a gas reception terminal, processing facility, storage facility or importing interconnector, and used for the conveyance of gas to consumers as defined in the Gas Safety (Management) Regulations (GS(M)R).

**network analysis**

Modelling of a pipe system to simulate flows and pressures assuming that instantaneous supplies and demands are identical.

**network analysis, transient**

Modelling of the pipe system to simulate flows and pressures, taking into account that supplies and demands will vary with time, and may not match.

**network controller**

Suitably qualified engineer appointed by the Responsible Engineer (RE) to be the point of contact for all internal and external organisations.

**node, relating to network design**

Notional point on a gas supply system, used in network analysis, to identify a junction of two or more pipe sections, including a change in pipe diameter or material or used to allocate gas demands to the system.

**noggins**

Horizontal timber rails fitted between studs in the wall panels to provide fixing points.

**non-controlled interface**

System interface where gas pressure and/or flow is not continuously controlled.



**non-hazardous area**

Area in which an explosive gas/air mixtures is not expected to be present in quantities such as to require precautions for the construction, installation and use of apparatus.

**non-return valve (NRV)**

Valve which prevents the reversal of gas or air flow, constructed to meet agreed performance standards.

**non-routine operation procedure**

Formal written document used to control complex operations.

**normal (operating) conditions**

Conditions when no fault exists on any device or stream.

**normal operation**

Situation when equipment is operating within its design parameters.

**normal start-up rate**

Gas flow rate at which the main burner is normally ignited.

**Ofgem approved meter installer (OAMI)**

Ofgem registered gas meter fitters with a specific meter installation qualification.

**oil filming, relating to watersealed gas holders**

Oil pumped inside in an attempt to prevent gas contents from becoming wet because of evaporation of the tank water.

**one call system**

One telephone number for all Utilities.

**open at rest regulator**

Design of regulator in which the internal flow control element(s) is designed to be in the open position when all control and sensing connections are removed.

**open cut**

Method by which access is gained by excavation from ground level to the required level underground for the installation, maintenance or inspection of a pipe, conduit or cable.

**open flue appliance**

Appliance designed to be connected to an open flue system.

**open flue system**

System that evacuates the products of combustion to the outside air and where combustion air is drawn directly from the room or space containing the appliance, without the use of mechanical fans or ejectors.

**operating levels**

Set points of all control devices under operating conditions.

**operating margins, relating to transmission system design**

Volume of gas required to meet unforeseen circumstances such as:

- the demand forecast, prior to any day, is correct and the supplies set too low, for some time before the error is discovered. Subsequent within-day forecasts may also be incorrect
- failure of plant to operate
- supply failure.

**operating pressure (OP)**

Pressure at which a gas system operates under normal operating conditions.

**operator (of a gas pipeline)**

Person who is to have or (once gas is conveyed) has, control over the conveyance of gas in the pipeline.

**outage**

Unexpected unavailability of plant which was believed to be available.

**outer lift (bottom lift)**

Outside lift of a watersealed gasholder, having the greatest diameter, moving closest to the walls of the tank.

**outlet pressure**

Pressure at the outlet of a component.

**ovality**

Difference between the maximum and the minimum diameter divided by the mean diameter at any one cross-section of a pipe, generally expressed as a percentage.

**over speed**

Fault condition in which a machine does not respond correctly to the control of fuel flow, leading to an uncontrolled excess speed.

**overpressure cut-off device**

Device which is designed to shut off the gas flow in the event of unacceptably high pressure being detected within the system it protects.

**overpressure protection device**

Device designed to limit the maximum pressure to which the downstream system can be subjected.

**owner of a source of gas**

Party that owns a pipeline, landfill site, container etc. from which gas is suspected to be escaping.

**oxygen enrichment**

Technique that employs the enrichment of air supplied to a conventional air gas burner.

**oxygen/gas burners**

Oxygen and gas burners with no air present.

**party wall**

Wall between two adjoining dwellings or occupancies.

**patch bolt**

Special bolt which can be inserted into a hole in the metal of a low pressure gasholder to secure an external patch.

**peak 1 in "n" day demand**

Daily demand level which would be exceeded only in 1 year in "n".

**peak instant demand**

Highest instantaneous gas demand, normally measured at a rate per hour, which occurs over a 60 second period.

**peak instantaneous demand (PID)**

Level of demand that represents the greatest possible demand given appliance mix, which could be required to flow through the service.

**peak level OP (peak level operating pressure)**

Upper limit of variations in system pressure permitted under normal conditions.

**peak demand shaving**

Gas held to supply "needle peaks" at times of severe weather, either within days or on a daily basis.

**pearson survey**

Method of locating faults in pipe protective wrapping, by measurements taken at ground level above the pipe and without excavating.

**permanently moored boat (see also "waterborne accommodation")**

Vessel that is not used primarily for navigation, whether or not it is any person's sole or main residence.

**permit to work**

Formal written document used to control certain types of work that are potentially hazardous.

**pig**

Piston-like device, for example a steel frame and cup washers of rubber, neoprene or other suitable material, such that compressed air, gas or water pressure will propel it along a pipeline or pipework.

**pig trap**

Fabricated pipe fitting for inserting and removing pigs from a pipeline while in service.

**piggable**

Capable of passing a pig.

**pilot bore**

Creation of the first (usually steerable) pass of any boring process which later requires back reaming or similar enlarging.

**pilot burner**

Small gas flame or main gas flame at a low burn rate for igniting gas at the burner ports.

**pilot control**

Auxiliary system that controls a main regulator or other device.

**pilot flame**

Start-gas flame established at a separate pilot burner which is utilized to ignite a main flame.

**pilot fuel**

Small quantity of oil injected into the cylinders of dual-fuel engines to cause ignition of the gas/air mixture therein.

**pipe and cable locator**

Instrument used for the detection of buried metallic pipes and cables.

**pipe array**

Lengths of buried pipe laid in parallel within a controlled site, being manifolded together and connected to a gas supply/discharge system via regulation equipment with or without compressor facilities for the purpose of storing high pressure gas.

**pipe jacking**

Technique of installing a line of circular pipes into the ground by pushing from a fixed point with hydraulic rams.

**pipeline**

System of piping with all associated equipment and stations up to the point of delivery.

**pipeline isolation valve (PIV)**

Either a transmission pipeline valve or a distribution main valve (DMV) or a service isolation valve (SIV).

**pipework**

System or part system of components designed to contain gas, for example pipe, valve, fitting (including appliances) meter, regulator, etc.

**piston**

Moving part of a waterless or dry gasholder which allows the amount of stored gas to vary while maintaining a constant pressure.

**piston seal**

Method of ensuring that gas cannot leak between a piston and the containing walls of a waterless or dry gasholder.

**planning horizon**

Period of time considered to be appropriate for planning purposes and for evaluation of capital investment decisions on major plant and equipment.

**plumbing, relating to a watersealed gasholder**

Measurement of columns to assess any changes in their position or alignment.

**popping**

Removal of all creases from the fabric seal of a dry gasholder by deliberate over-pressurizing, normally prior to use.

**post-purge**

Purge which follows safety shut-down.

**premises (HSWA 1974)**

"Premises" includes any place, and in particular, includes:

- (a) any vehicle, vessel, aircraft or hovercraft,
- (b) any installation on land (including the foreshore and other land intermittently covered by water), any offshore installation, and any other installation (whether floating, or resting on the seabed or the subsoil thereof, or resting on other land covered with water or the subsoil thereof, and
- (c) any tent or movable structure.

**premises pipework**

Pipework provided by the occupier of premises which is not adopted by the upstream GT but which is not "installation pipework".

**pre-purge**

Purge which precedes an ignition attempt.

**pressed joint**

Joint in which tightness is achieved by making use of an appropriate tool for mechanically deforming either a fitting including a sealing element onto a metallic pipe in order to form an removable connection.

**pressure**

Exertion of a continuous force upon an area (including fluids, gases etc.), expressed in units of force per unit of area.

**pressure boundary (break)**

An interface between two areas of an installation with different design pressures.

**pressure deviation**

Difference between measured pressure and set pressure.

**pressure overshoot**

Difference between maximum instantaneous pressure and set pressure.

**pressure purging (pulse purging)**

Total purging accomplished by successive pressurising and depressurising operations until an acceptable end-point is reached.

**pressure regulating installation (PRI)**

Assembly of equipment designed to regulate, or reduce, the pressure of gas.

**pressure regulating system**

Control system, the purpose of which is to hold pressure constant or to vary it in a pre-determined manner.

**pressure safety system**

System which acts independently and which ensures that outlet pressure does not exceed safety limits.

**pressure switch**

Switch that makes electrical contact when a certain set pressure been reached on its input.

**pressure transducer**

Device which converts gas pressure into an electrical signal proportional to that pressure.

**pressure regulating installation (PRI)/regulator inlet valve (PRIIV/RIV)**

Valve fitted upstream of, and adjacent to, a PRI/regulator to shut off the supply of gas.

**pressure regulating installation (PRI)/regulator outlet valve (PRIOV/ROV)**

Valve fitted downstream of, and adjacent to, a PRI/regulator to shut off the supply of gas.

**PRI station**

PRI, together with items which support it, such as the site, fencing, housing, etc.

**primary grade of release**

Release which can be expected to occur periodically or occasionally during normal operation.

**primary inlet**

Point where combustion air enters a SE-duct.

**primary meter**

Gas meter, the index reading of which constitutes the basis of charge for all gas supplied through that meter.

*Note: This definition is a variation of the legal definition taken from GS(I&U)R.*

**principal stresses**

At any point in pipework, the maximum and minimum compressive or tensile stresses at right angles to one another, calculated by combining the individual hoop, axial and shear stresses at that point.

**probability density**

Function which defines the relationship between the value of a parameter and the probability of occurrence of the value.

**product/product pipe**

Permanent pipeline, duct or cable being installed for operational use.

**programmable electronic system (PES)**

Electronic control system which embodies digital computing processes.

**promoter**

Persons, firm, company or authority for whom a new service or other work is being carried out (includes "contractor").

**proof of closure (POC) switch**

Switch fitted to a safety shut-off valve (SSOV) with mechanical over-travel, which proves the SSOV to be in the fully closed position.

**proof stress (Rp)**

For materials which do not exhibit a sudden clear yield point, stress at which a non-proportional elongation, equal to a specified percentage of the original gauge length, occurs.

**protected shaft**

Shaft that passes directly from one compartment to another, enclosed within a fire resistant construction.

**protective device or system**

Device that limits the amount of energy passing into a hazardous area from a non-hazardous (safe) area.

**protective multiple earth (PME)**

Earthing arrangement, found in TN-C-S systems, in which the supply neutral conductor is used to connect to the earthing conductor of an installation with earth.

**proving**

Sensing of a system parameter, for example a gas pressure, a valve position or shaft speed which, either directly or indirectly, ascertains unambiguously that it is within a prescribed range.

**proximity distance**

Minimum distance permissible between a pipeline or installation and any normally-occupied building or traffic route.

**public highway**

Way over which all members of the public have a right to pass and re-pass provided that the use of the way is of right and not by permission.

**pull-back**

That part of a guided boring or directional drilling process in which the drill string is pulled back through the bore into the entry pit, usually installing the product pipe at the same time.

**pulsation vessel**

Vessel provided for damping out flow and pressure pulsations produced by a gas compressor.

**pup**

Short make-up piece of pipe.

**purge velocity**

Velocity of purge gas in a vent pipe.

**purge/purging**

Displacement of one type of gas/fluid with another gas/fluid.

**purge end-point**

Pre-specified mixture of components, chosen so that hazardous mixtures cannot be formed at any stage of the purging operation.

**purge pressure**

Pressure in a pipe during purging.

**purge velocity**

Velocity of the purge gas in the pipe being purged.

**purge volume**

Theoretical volume of purge medium to complete the purge.

**rails (spiral rails - spiral-guide rails)**

Steel rails, similar to railway lines, attached at 45° to the lifts of spiral-guided gasholder, to control the lifts as they rise and fall.

**ramp rate**

Rate of change of gas flow.

**reamer/reaming**

Tool or the process of using a tool for opening the hole to a larger diameter than the pilot bore.

**receiver**

Vessel on the outlet of a gas compressor having a volume sufficient to provide storage volume of gas at high pressure to satisfy the pressure and flow requirements of the load it serves.

**reception/receive/exit shaft/pit**

Excavation into which trenchless technology equipment is driven and recovered following the installation or renovation of the product (pipe, conduit or cable).

**recommended gas supply arrangements**

Gas supply arrangements that are recognised by IGEM/G/1, as being preferred arrangements.

**regulator**

Device which automatically controls pressure or volume flow at a selected point in a gas stream.

**regulator/PRI inlet valve (RIV/PRIIV)**

Valve fitted upstream of, and adjacent to, a regulator/PRI to shut off the supply of gas.

**regulator/PRI outlet valve (ROV/PRIOV)**

Valve fitted downstream of, and adjacent to, a regulator/PRI to shut off the supply of gas.

**reinstatement**

Backfilling, compaction and re-surfacing of any excavation to restore the surface and underlying structure to enable it to perform its original function.

**release rate**

Quantity of flammable gas emitted per unit time from a source of release.

**relief valve**

Valve which automatically opens at a pre-determined pressure to vent gas so as to relieve pressure in a gas system.

**repair**

Process to restore a system to its original performance.

**residential park home**

Mobile home, designed to comply with BS 3632 but that does not meet all legal requirements for the construction and use of road vehicles. It is a caravan for permanent residence as defined in the Caravan Sites and Control of Development Act and the Caravan Sites Act.

**resistance**

Ability of a component to withstand forces acting on it.

**response time**

Time interval taken by a control or limiting device to complete a response to a change in state.

**rest blocks, relating to a watersealed gasholder**

Provision made to support grounded lifts which are fully immersed in the tank water.

**Reynolds number (Re)**

Dimensionless number that gives a measure of the ratio of internal forces and consequently quantifies the relative importance of these two types of forces for given flow conditions. It is used when predicting whether the flow in a pipe is likely to be laminar or turbulent.

**riser**

Vertical pipe that carries gas between floors within a building.

**risk**

Likelihood of a specified undesired event occurring within a specified period or in specified circumstances, expressed as a frequency (rate of occurrence) or as a probability, depending on the circumstances.

**risk assessment**

Evaluation of the likelihood of undesired events and the extent of harm or damage, together with judgements concerning their significance.

**room-sealed appliance (type C appliance)**

Appliance whose combustion system is sealed from the room in which it is located and which obtains air for combustion from a ventilated uninhabited space within the premises or directly from the open air outside the premises and which vents the products of combustion directly to open air outside the premises.

**rope-guided gasholder**

Early form of watersealed gasholder in which the upper lift is guided by counterweights and pulleys.

**rotational motor**

Motor on a drill rig which rotates the drill string.

**route maps**

Maps to a scale suitable for showing general details, for example agricultural land, built-up areas, contours and all special crossings.

**routine operation procedure**

Formal written document used to control less complex operations.

**sacrificial anode**

Means of corrosion protection for buried equipment. A mass of relatively electro-positive metal, such as magnesium or zinc, electrically connected to a pipeline, to ensure that the pipe is maintained as the cathode in a galvanic cell.

**safe area**

Area in which an explosive atmosphere consisting of a mixture with air of gas, vapour or mist is never present.

**safe dispersion distance**

Distance from a Natural Gas release at which the mean centre line concentration has decayed to 50% LFL.

**safe operating limit (SOL)**

Limit beyond which the system should not be taken. It is not the ultimate limit, beyond which system failure will occur.



**safe-start check**

Means to provide safety shut-down or lockout on starting-up if a simulating condition is indicated by the flame safeguard in advance of the ignition phase.

**safety audit**

Critical examination of all, or part, of a total operating system with relevance to safety.

**safety case**

Document containing the particulars for safe operating practice, as required by the Gas Safety (Management) Regulations (GS(M)R).

**safety measure**

Any means that eliminates or reduces a risk.

**safety report/safety case**

Presentation of a justification for the safety of an installation.

**safety shut-down**

Shutting off of all gas and ignition energy.

**safety shut-off system**

System of safety shut-off valves (SSOVs) with associated control circuits that enables the supply of fuel to be shut off.

**safety shut-off valve (SSOV)**

Valve that is actuated by the safety control so as to admit and stop gas flow automatically.

**safety shut-off valve system (SSOV system)**

System of SSOVs with associated control circuits which enables the supply of gas to a burner to be admitted or shut off.

**scheme of examination**

Written scheme referred to in Regulation 8 of the Pressure Systems Safety Regulations (PSSR).

**seal**

Means of indicating that equipment has remained as originally fitted and set, and of deterring unauthorised tampering.

**sealant (seal medium)**

Liquid used to form a gastight seal around the periphery of the piston in a waterless gasholder.

**seasonal storage**

Facility to enable extra input into a system at time of high demand over a limited number of days in a severe winter.

**secondary grade of release**

Release which is not expected to occur in normal operation and, if it does occur, is likely to do so infrequently and for short periods.

**secondary meter**

Meter, other than a primary meter, for ascertaining the quantity of gas provided by a person for use by another person, whether or not there is also a primary meter in respect of the gas supplied.

**secondary sterile area**

Area bounded by a specified contour measured in power per area in the event of the ignition of multiple vents.

**security-type valve**

Valve that cannot be closed or opened without the use of a special tool and/or key.

**Se-duct system**

Shared/common flue system where a duct rises vertically through a building. The duct is open at the extremities to draw combustion air into, and take combustion products from, room sealed appliances (Type C appliances).

**sense, sensing (gas)**

Refers to the gas pressure sensed at a point.

**sensing line**

Pipe through which pressure from a sensing point is transmitted to a device.

**sensitive location**

Location at which it may be difficult for people to escape or which has concentrations of people who would have difficulty in escaping and/or with an increased sensitivity to thermal radiation.

**sensor**

Device that detects a change of physical parameter and generates an electrical signal corresponding to that change, for example a photodiode which detects changes in light intensity or a reed switch which responds to change in magnetic field.

**service (pipe)**

Pipe for conveying gas to premises from a distribution main, being any pipe between a distribution main and the outlet of an emergency control valve (ECV).

**service excess flow valve (SEFV)**

Valve installed in a service which will substantially shut off the flow of gas in the event that the flow exceeds a defined limit.

**service isolation valve (SIV)**

Valve (other than an emergency control valve (ECV)) for controlling the supply of gas, being a valve:

- incorporated in a service (pipe)
- intended for use by a gas transporter (GT)
- not situated inside a building.

**service pipework**

Pipe for distributing gas, for example liquefied petroleum gas (LPG), to premises from a storage vessel to the outlet of an ECV.

**service regulator**

Apparatus for automatic regulation of pressure or of volume flow at a selected point within a service (pipe).

**set point**

Value of pressure or flow rate which a regulator or other control device is set to maintain.

**set pressure**

Command value to a pressure regulating system.

**shakedown**

Condition of elastic system response once initial localised yielding has occurred under the limits of coincident pressure and temperature.

**shared/common flue system**

Flue system serving two or more appliances.

**shear stress**

Stress resisting the relative slippage of cross-sectional planes. The stress is produced by the shear force and/or torsional moment acting on the pipe or component cross-section.

**shunt duct system**

Shared/common flue system constructed of a number of smaller individual flues.

**shut-down**

Shutting off of all fuel and ignition energy.

**singularities**

Undefined or indefinitely large values often resulting from a division by zero.

**siphon**

Vessel installed at a low point in a pipeline or pipework, to collect condensate and other liquids.

**slam-shut valve (SSV)**

Valve that is designed to close quickly in the event of an abnormal (usually excess) pressure being detected downstream, and which requires manual intervention to reset.

**sleeve**

Encasement inserted into a prepared hole in a structure for the reception of a pipe.

**slug purging**

Purging by the formation of a barrier of inert gas between fuel gas and air.

**slurry**

Fluid used in microtunnelling, sometimes bentonite or water, which is used as face support medium and also as a material transporter by pumping to the surface.

**snubber**

Combination of components and volumes provided for damping out flow and pressure pulsations produced by a gas compressor.

**societal risk**

Relationship between the frequency and number of people in a given population suffering a specified level of harm from the realisation of specific hazards.

**societal risk criteria**

Criteria relating to the likelihood of a number of people suffering a specified level of harm in a given population from the realisation of specified hazards.

**sole plate**

Generally, the first timber component to be fixed, the sole plate is fixed to the substructure over a dpc and thus forms the base upon which the timber structure is erected.

**source**

Point on a distribution system or individual service (pipe) which is capable of supplying a load, i.e. the outlet of a regulator or point on a distribution system capable of providing a supply to a new distribution system.

**source of release**

Point or location from which flammable gas may be released into the atmosphere such that a flammable gas atmosphere could be formed.

**spiral-guided gasholder**

Watersealed gasholder in which the lifts are guided by carriages operating on spiral rails, usually set at an angle of 45°.

**spit-back**

Explosion of the gas/air mixture inside the inlet manifold of an engine.

**split collar**

Fitting in two halves, installed around a live pipeline, for making connections or repairing a broken or leaking pipeline.

**squeeze-off**

Squeezing of a pipe to close the bore and stop the flow of gas with a specialist tool.

**standard flow rate**

Flow rate under specified reference conditions.

**start-gas flame**

Flame established at the start-gas rate, either on the main burner or on a separate pilot burner.

**start-gas rate**

Gas flow rate admitted either to a separate pilot burner or to a main burner during the start-gas flame ignition period.

**steady oscillation**

Oscillation, the amplitude, period and wave form of which remain unchanged.

**steady state**

Final state when the effects of external disturbances have ceased.

**sterile area**

Area surrounding a vent stack or group of vent stacks in which no plant items are situated (other than the vent system), to which personnel access is restricted and where during any single vent, if ignition occurred, the heat flux level at the sterile area boundary fence will not exceed a specified limit.

**storage vessel**

Storage container designed to be filled or re-filled with gas at the place where it is connected for use or a re-fillable cylinder designed to store gas, and includes the vapour valve; but it does not include a cylinder or cartridge designed to be disposed of when empty.

**strainer**

Metal mesh type of sieve fitted into pipe systems and other installations to collect debris, dust, etc. in the gas stream.

**stratification**

Where low density gas flows over a higher density gas or where high density gas flows under low density gas.

**stream discrimination device**

Device situated in each regulating stream to prevent a healthy stream(s) from shutting down due to excess pressure in another stream.

**stream protection**

Means of ensuring that an excess pressure fault on a regulator stream causes the slam-shut device on that stream only to be activated.

**strength test**

Test of individual fabricated elements of a pipework system, such as a length of pipe, with flanges or compression fittings attached, intended to prove the structural integrity of the fabricated element.

**strength test pressure (STP)**

Pressure to be applied to a system during a strength test.

**stress concentration factor (SCF)**

Ratio of local stress to a remote reference stress.

**stress exception**

Term used when the calculated stress on a component/fitting is found to exceed any of the acceptance criteria for sustained, shakedown or fatigue loading.

**stress range**

Algebraic difference of stresses at a particular point in the pipe or component, due to variations in the operating conditions.

**strip maps**

Maps, to a large scale, showing the route of a pipeline and which may contain marginal notes, etc., giving information on land usage, ownership etc. and profiles.

**structural reliability model**

Mathematical or statistical model of a failure mechanism.

**structural wall**

Timber frame panels with timber studs at nominal centres and a sheathing of plywood or a similar wood-based board. Insulation (usually mineral wool) is fitted within each panel.

**sub-assemblies**

Arrangements of pipework and equipment fabricated and assembled independently from the main pipework configuration often away from site at a manufacturer's premises.

**subsidiary flue**

The part of a shared or common flue system that connects the appliance outlet to the main flue.

**sunstock control**

Control which automatically removes gas from a low pressure gasholder in which gas has expanded beyond the high-level limit for any reason.

**supplementary firing burner**

Burner that is provided with all or most of its combustion air (oxygen) requirements from the turbine exhaust gases.

**survey tools**

Downhole equipment and instruments used to determine the position of a bore in directional drilling or site investigation.

**sustained stress**

Stress induced in the pipe wall or component which is not changed by distortion or movement.

**switchover**

Process of changing from firing on one main fuel to firing on another.

**system interface**

Point of connection between two gas supply systems operated by different companies.

**tamper circuit**

Circuit built into, or added to, a meter and designed so as to detect and signal any illicit tampering or interference.

**tandem control**

Arrangement of two pilot operated regulators or two control valves in series and is a derivative of monitor and active control.

**tank, relating to a watersealed gasholder**

Vessel holding water which maintains a seal as the lifts rise from and fall into it.

**tank balcony (platform)**

Walkway around the raised tank of a watersealed gasholder.

**technical appraiser**

Person who is technically competent in an appropriate professional discipline.

**technical handbook**

Technical project file for specific plant.

**telemetry**

Transmission of information and control actions which will allow the operation of equipment remotely (as opposed to locally).

**temperature/pressure sensor**

Device that detects a change of physical parameter and generates an electrical signal corresponding to that change.

**temporary operating pressure (TOP)**

Maximum pressure at which a system can be operated temporarily under the control of regulating devices during fault conditions.

**temporary vent**

Purpose-designed demountable vent stack, which is erected temporarily for the purpose of venting piping or pipework or plant for maintenance and commissioning operations.

**terminal**

Device fitted at the flue outlet to allow or assist products of combustion to escape, minimise down draught and prevent entry of material which might block the flue.

**test meter**

Meter temporarily installed to measure a defined parameter.

**thermal cut off device (TCO)**

Valve that automatically closes when the measured temperature reaches a pre-determined level.

**thermowell**

Metal pocket protruding into a fluid stream/system to house a temperature measuring device.

**third party gas escapes**

Escapes of gas from a source other than one for which the gas emergency service provider (ESP) is responsible.

**thrust boring**

Method of forming a pilot bore by driving a closed pipe or head from a thrust pit into the soil which is displaced.

**tie-in**

Weld to join two sections of pipe or pipework already laid or constructed.

**tightness test**

Test of piping or pipework for leakage.

**tightness test pressure (TTP)**

Pressure to be applied during a tightness test.

**tightness test permitted leak rate (TTPLR)**

Leak rate permitted during a tightness test and which vary according to the test gas used and the test pressure.

**TN-C-S system**

Electrical system in which neutral and protective functions are combined in a single conductor.

**trace heating**

Provision for supplying heat to prevent the contents of a pipe from changing state.

**trenchless technology**

Techniques for utility and other line installations, replacement, renovation, inspection, location and leak detection, with minimum excavation from the ground surface.

**turbulent flow**

Movement of a fluid in which subcurrents in the fluid display turbulence, moving in irregular patterns, while the overall flow is in one direction.

**turndown**

Ratio between the range defined by maximum and minimum flow rates in which the device indications are not subject to an error greater than the maximum permissible error.

**two stage pressure reduction (with monitor override on 1<sup>st</sup> stage)**

Arrangement of two regulators in series whose pressure settings are so arranged as to allow a stepped pressure reduction through the first stage regulator to maintain a controlled pressure for the second stage regulator, which then controls the final outlet pressure requirement.

**U-duct system**

Shared/common flue system comprising a duct in the form of a `U', the vertical limbs being open at the top and adjacent. One limb provides combustion air, while the other limb, into which room sealed appliance flues are installed, removes products of combustion.

**ultimate limit state**

State of a pipeline when it can no longer contain the gas it is carrying.

**unconverted index**

Index reading displayed on a conversion device which repeats the gas volume recorded by the meter.

**under-pressure tee**

Split fitting used to take a branch connection from a pressurised pipe.

**usable range**

Range claimed by a manufacturer.

**utility infrastructure provider (UIP)**

Company which designs and installs gas mains and services on behalf of a developer for adoption by a gas transporter (GT).

**valve proving system**

System to check the effective closure of a system shut-off valve.

*Note: May be used in conjunction with manual or automatic valves.*

**vapour control layer (VCL)**

A membrane fixed to the stud framing, which increases the vapour resistance of the internal wall face to reduce the transmission of water vapour into the wall panel.

**ventilation**

Movement of air and its replacement with fresh air due to the effects of wind, temperature gradients, or artificial means, for example fans or extractors.

**ventilator**

Opening, often with a security grille, used for ventilation.

**venting**

Discharge of gas (or, when purging, other mixtures) from gas plant to atmosphere.

- vent line Device for conducting relief, bleed or fault gas away from gas plant, usually to atmosphere
- vent Equipment aperture that vents gas
- vent pipe A pipe, usually vertical, used to vent gas to atmosphere, i.e. a vent line. Alternatively, a vent pipe may be a pipe containing vent lines and breather lines.

**vent valve**

Valve having the same performance requirements as a safety shut-off valve (SSOV) and used as part of a SSOV proving system to prove the effective closure of the main SSOVs.

**volumetric regulator**

Regulator which maintains a pre-set volume flow rate, irrespective of pressure.

**washover pipe**

Rotating drill pipe of larger diameter than the pilot drill and placed around it with its leading edge less far advanced.

**waterborne accommodation (see also “permanently moored boat”)**

A permanently or temporarily occupied floating domestic accommodation vessel that is designed to be permanently moored to a fixed berth, and is not fitted with an onboard gas supply. A means of propulsion may or may not be fitted.

**waterless gasholder**

Low pressure gasholder in which the moving parts are sealed by other methods than water.

**watersealed gasholder**

Low pressure gasholder in which water plays an essential part as a sealing medium.

**wayleave**

Right of way over another’s ground or property, rented to the owner of a pipeline.

**weep by-pass pressure proving system**

System which proves that burner gas isolation valves are closed immediately prior to the start of an ignition sequence by pressurizing the pipework to the burner gas isolation valves through a restricted by-pass around the safety shut-off valve(s) (SSOV(s)).

**weldability**

Ability of a material to be welded satisfactorily.

**weldolet**

Forged fitting, of the saddle type, enabling the fabrication of a fully welded branch connection.

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**work**

In relation to a gas fitting, any of the following activities carried out by any person, whether an employee or not:

- installing a fitting
- maintaining, servicing, permanently adjusting, repairing, altering or renewing a fitting or purging it of air or gas
- changing the position of a fitting when it is not readily removable
- removing a fitting.

**working flame burners**

Working flame burners (oxy/gas or air/oxy/gas) typically used for glass working, brazing rigs, flame cutting and metal hardening.

**zener barrier**

A number of zener diodes, resistors and fuses (depending upon manufacturer and specification) which operate by limiting both the applied voltage and current. For correct operation, they require a high integrity earth connection.