Definitions for the gas industry

IGEM/G/4 Edition 3
Communication 1920

Institution of Gas Engineers & Managers

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Founded 1863
Royal Charter 1929
Patron: His Majesty the King

IGEM STANDARDS

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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 April 2026 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 1st April 2026 may continue to be used until such time as that Standard is made obsolete. Where an IGEM Standard published on or after 1st April 2026 does not contain definitions, this Standard applies.

1.4 For metering, this Standard should be read alongside IGEM/G/1 "Defining the boundaries between the Network, primary 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 free to access on IGEM's website at www.igem.org.uk alongside IGEM/G/1. In the event an update is required to any definition, an amendment will be issued.

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 either:

- addressed to Technical Services, IGEM, IGEM House, 26 & 28 High Street, Kegworth, Derbyshire, DE74 2DA; or
- emailed to technical@igem.org.uk.

These 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 imply acceptance of liability for the consequences and does not relieve the responsible engineer his or her obligations.

1.7 This Standard was published in August 2026.

SECTION 2 : SCOPE

2.1 This Standard is applicable to all Natural Gas systems, liquefied petroleum gas (LPG), LPG/air systems, Biomethane, Hydrogen and Hydrogen blends where appropriate.

2.2 All pressures are gauge pressures unless otherwise stated.

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

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SECTION 3 : DEFINITIONS

100% Hydrogen
A term used to describe Hydrogen that is compliant with PAS 4444 and IGEM H/1, and not that it is actually pure Hydrogen. The phrase is used to differentiate this from a Hydrogen / Natural Gas blend.

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.

A

accuracy
Closeness of agreement between a measured quantity value and a true quantity value of a measurand.

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).

adequate ventilation
Any means of ventilation that is sufficient to ensure that a gas concentration in excess of 25% LFL is unlikely outside of the classified zone(s).

adjustment cover
Component or components, not exposed to gas, covering the outlet pressure adjustment screw.

advance
Distance a trenchless bore has progressed during a shift or day.

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

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air box
Box fitted to a water sealed 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.

Note: The exact value of resistance varies with the strength of an applied magnetic field, i.e. the pulse actuating magnet. As it is no longer possible to ascribe a digital value, such a failure results in very unreliable and random operation leading to both missing and extra pulses being generated in subsequent electronic circuits.

anchor
A securing device to maintain in a pipe, a point fixed both in position and direction under the design conditions of temperature and loading.

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.

appliance compartment
An enclosure (not being a habitable space) specifically designed or adapted to house one or more gas appliances only.

appraisal
A review of an approved Design Output Package by an Appraiser to establish that appropriate codes, policies, procedures and Standards have been applied, that there are no omissions within the detailed design and that the User's requirements have otherwise been met. It does not include the responsibility to check or approve the design although selective checking may be carried out to prove specific aspects of the design.

appraisal report
A summary of the Appraiser's assessment of the Design Output Package. All comments are to be relevant, justifiable and objective in terms of compliance with codes, Standards and Specifications, etc. This report will be signed by the Appraiser and issued to the competent Initiator for onward transmission to the Designer.

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

approved facility
A facility for testing or calibration that is independently accredited (by UKAS, for example for UK facilities) as meeting the requirements of ISO/IEC 17025 in the relevant field.

Approved Meter Installer (AMI)
A Party which is approved (or which is seeking approval) as such under the Metering Accreditation Schedule, being the entity, which undertakes the installation, replacement, repair and maintenance of gas metering equipment.

arrangements
Processes, practices and contracts that an organisation or person has in place to manage their undertaking.

assembly
The assembled meter regulator, flexible meter connector, meter liner and fittings.

assessment
Measurement of the required level of competence.

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.

At Risk (AR)
Is a potentially dangerous appliance/installation where one or more faults exist and which, as a result, may in the future constitute a danger to life or property.

atmosphere sensing device (ASD)
A device that shuts off the gas supply to an appliance burner before there is a build-up of a dangerous quantity of combustion products in the room concerned (also known as an oxygen depletion system).

audit
Systematic assessment of the adequacy of a management system.

auger
Helical tool for the removal of spoil from behind a cutting head.

auger boring
Trenchless method of pipe installation where excavated spoil is transferred from the cutting face by a continuous auger to the launch pit.

auger boring machine
Machine used to rotate the auger flights within an auger bore. Typically, can be rail mounted behind the pipe or directly mounted on top of the pipe.

austenitic stainless steel
Chrome-nickel steel with low carbon content, commonly known as 18/8 stainless steel.

authenticity
The quality of being genuine or real. The word authenticity is the state of something being authentic, or legitimate and true.

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

authoriser
Independent organisation appointed by the Strategic Management Board (SMB) to authorise organisations intending to be "Recognisers of training", recognise training programmes and recognise the training provided by "Independent Training Providers". In addition, undertake annual audits of those organisations that are a "Recogniser of Training" and the training of "Training Providers" including independent training providers.

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.

Note: This burner is able to operate independently of the turbine and may be located on downstream process plant. It may also operate in the supplementary firing mode when the turbine is operating, with or without the support of the independent combustion air fan.

awareness
Knowledge or perception of a situation or fact; in this case a developing and growing awareness.

awarding organisation
Organisations recognised by Ofqual, Scottish Qualifications Authority (SQA) and Welsh Government (Qualification Wales) to provide specific qualification types e.g. from General Certificate of Secondary Education (GCSE), O and A levels to specialised vocational qualifications.

azimuth
The heading of an object (horizontal directional drilling (HDD) drill head) measured clockwise from North. Azimuth is used for "gyro" and other "wireline" guidance systems. Not typically used in "walkover" locating.

B

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
A gas meter which has been stamped and/or approved by the relevant UK Government department or other metrological authority acceptable to said UK Government department, as legal metrology and which operates within prescribed statutory limits.

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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.

banksman
A person who assists the excavator driver, from a position where they can safely see into the excavation and warn the driver of any services or other obstacles.

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

Note: When measuring the amount of thermal energy supplied to a consume, the base conditions which define the volume need to be identical to those which define the calorific value (CV).

base plug
Component at the base of the type B regulator, exposed to gas and provided to facilitate assembly.

bedsitting room
Any room or space used for living and sleeping purposes.

bend radius
Radius of the bend measured to the centre line of the hose.

bend radius (minimum)
The tightest curve which "drill pipe", or "pipe" should be expected to follow without exceeding design calculations and/or manufacturer's guidelines.

bent sub
Short coupling placed behind the drilling bit in an HDD string to intentionally change the direction or angle of the borehole.

bentonite
A highly reactive clay, usually supplied in powdered form, which is mixed with water to produce the basis of most HDD "drilling fluids". A "fluid additive" supplied under many different trade names depending on the supplier and grade.

biogas
Gas, comprising principally methane and carbon dioxide, obtained from the anaerobic digestion of biomass and associated processes.

biomass
Biological material from living, or recently living organisms, typically this may be plants or plant-derived materials.

biomethane
A methane-rich renewable gas (typically ≥ 95% CH_4) produced by upgrading raw biogas generated through anaerobic digestion or thermal gasification of biodegradable organic substrates and associated processes.

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bio-syngas
Gas, comprising principally methane, carbon monoxide and/or hydrogen, obtained from gasification of biomass.

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.

block valve
A valve which provides a tight shut-off for isolation purposes.

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

blowhole/blow out
A "blow hole" is created where "inadvertent returns" exit at the surface during HDD, often, but not always accompanied by localised "heave" of the surface.

bore
Internal diameter of pipe/hose and/or an underground tunnel or passage created to facilitate installation of a pipe.

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 water sealed 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.

breakaway connector
A device fitted between the "swivel" and the "towing head" on an HDD string which is designed to fail in the event of excessive "pullback force" being applied. Designed to reduce the risk of damage to the pipe through overstressing, but risks loss of tooling.

break-away device
Device which, when activated, stops gas flow from the dispenser (for example if the vehicle moves away while still connected to the refuelling hose).

breakout
Fluid losses at surface when conducting trenchless excavation - see frac out or hydraulic vices used to connect and disconnect HDD drill pipes.

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.

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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.

building burning distance
Distance to thermal radiation flux causing piloted ignition of wood, for almost all assessments this is assumed to be from piloted ignition.

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

burst pressure
The pressure which causes failure and consequential fluid loss through the component envelope.

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.

C

cable strike
Hitting a below-ground, live, electrical cable.

calorific value (CV)
The quantity of energy that would be produced by the combustion of one unit of volume or mass of the gas measured under standard temperature and atmospheric pressure conditions (typically 15°C and 1013.25 mbar).

Typically quantified as MJ/m^3 or occasionally MJ/kg.

canopy
a) Roof, for example a shelter, a hood etc., which affords a degree of weather protection.

b) Extraction hood that covers one or more flueless commercial cooking appliances to remove combustion products and cooking smells.

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 water sealed gasholder.

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carrier
Existing pipe into which another pipe is inserted.

carrier pipe
See sleeve.

cascade dispensing sequence
Means of allowing efficient use of the gas storage facility by dividing it into banks operating at different pressure levels.

case length
Axial distance along a pipeline over which risk is assessed.

casing
Lengths of pipe usually constructed of threaded or welded lengths of steel pipes of larger diameter than the final bore size, to mechanically support a bore. Used most frequently where the first or last section of a bore is in very unstable ground

catastrophic failure
Rupture or failure of a process vessel, pipe, component and similar rare events that are reasonably unexpected.

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.

certification body
Accredited by National Accreditation Body for the United Kingdom (UKAS) following ongoing assessment against internationally recognised Standards to demonstrate their competence, impartiality and performance capability to provide an accreditation scheme in accordance with the Nationally Accredited Certification Scheme for Individual Gas Fitting Operatives.

chalet
An alternative term for a holiday caravan or a residential park home.

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. This includes chimneys of all materials (e.g., metal, masonry, plastic, etc.). It may be either an open flue chimney for use with an open-flued appliance or a room-sealed chimney configuration for use with a room-sealed appliance.

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.

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

circulation
The flow of drilling fluid from the rig, through the inside of the drilling rods to the bit, or reamer, then back through the drilled hole/bore to the entry or exit pit in HDD or micro-tunnelling works.

civil/structural engineering
The design and construction of all civil and structural elements which protect, support or enclose the pressure containing elements or their supporting equipment to ensure that they are able to safely resist the forces to which they may be subjected, along with the suitability and capability of the soils to support such civil and structural elements without causing any detrimental effects.

class of persons
All gas engineering businesses, including self-employed gas engineers, are (subject to the limited exceptions in regulation 3(4)) required to be in membership of a class of persons approved by HSE, whether they carry out such work as their main or part activity. Gas engineers who are employed by a member of an approved class of persons but who do separate work on their own behalf need to be in membership of such class of persons, e.g. Gas Safe registered, in their own right. This definition is an extract from GS(I&U)R.

class rating
A number indicating the pressure strength of a component.

Note: Class ratings are used in ASME Standards. See PN for the equivalent European system.

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 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.

CNG cylinder
Any pressure vessel used for the storage of compressed NG.

CNG fuelling station inlet isolation valve
Connection point to the supplier.

coefficient of discharge (C)
For an incompressible fluid flow, which relates the actual flow rate through a device.

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 water sealed gasholder columns on which carriage wheels run.

column-guided gasholder
Water sealed gasholder in which the movement of the lifts is constrained by an external framework designed to withstand the forces acting on the gasholder.

combined standard measurement uncertainty
Standard measurement uncertainty that is obtained using the individual standard measurement uncertainties associated with the input quantities in a measurement model.

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

combustion products discharge safety device
A device (usually temperature activated) that cause shut down of an appliance burner when there is an unacceptable spillage of combustion products at the appliance draught diverter.

Note 1: This device is sometimes referred to as a "TTB"

Note 2: The presence of this device will be indicated by the suffix "BS" on the flue type marked on the appliance data label – B11BS for example.

commercial catering establishment
An undertaking, whether carried out for profit or not and whether public or private, carrying out any or all of the following operations namely, preparation, processing, manufacturing, packaging, storing, transportation, distribution, handling or offering for sale or supply of food.

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

commissioning engineer
An engineer with the relevant competencies and authority to commission and put systems into use.

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 discharged.

competence
The combination of training, skills, experience and knowledge that a person has and their ability to apply them to perform a task safely. Other factors, such as attitude and physical ability, can also affect someone's competence

competent initiator
The person who identifies the need for new work, modification or repair. They will be able to demonstrate an appreciation of the technical disciplines relevant to the works they are initiating. The person ensures that the project progresses through all of its stages from the initiation stage to the final commissioning stage and that all of the relevant drawings, tests results and paperwork are completed.

competent person (generic)
Person having the appropriate training, skills, experience, knowledge, and behaviours needed to supervise or carry out work being undertaken in a safe and proper manner.

CompEx
Core competency certification for validating employees and contract staff of major users in the gas, oil and chemical sectors – offshore and onshore. It is specific to the requirements of inspection bodies who undertake the inspection of electrical equipment and installations in potentially explosive atmospheres. Training organisation courses need to be accredited by UKAS.

compound
An enclosed (usually by security fencing) area containing a group of buildings and/or gas metering equipment.

Note: Often, a compound is used for large, complex installations that include a pressure regulating installation (PRI) and associated metering streams.

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compression unit
A unit that compresses the NG consisting of one or more compressors, including all associated piping and ancillaries.

compressor
A machine which increases the pressure of gas from a low to a higher level.

conceptual study
This phase may be defined as the stage where the most practicable ideas and working principles for the project are selected from the Feasibility Study. The conceptual study defines the minimum level of detail needed to develop the preferred solution to a problem. HAZOPs, HAZIDs and functional safety assessment studies may be undertaken at this stage as appropriate. The requirement for a conceptual study is dependent upon the project's complexity and/or the User's need to identify commercial benefits. When required this stage will also identify User boundaries and ensure compatibility for commissioning and cathodic protection.

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.

confinement and congestion
A potential leak area around which there are obstructions to the air flow such as large items of plant, a high density of pipework or the proximity of the floor, walls or ceiling or a combination of them.

connector
Meter connector comprising corrugated hose and end fittings.

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 (not the landlord or the bill payer).

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.

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controlled gas escape
A gas escape that has been stopped by turning off the meter emergency control valve and confirming that the smell of gas has dissipated (usually attended within 2 hours).

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.

Note 1: The deviation from the ideal gas law is compensated by the compressibility factor.

Note 2: It is also possible for a conversion device to include the calibration curve of the meter.

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.

conveyor
Person who conveys gas through pipes and the network and having duties under Gas Safety (Management) Regulations (GS(M)R) and Pipeline Safety Regulations, and who may also hold a Gas Transportation Licence.

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

corrugated hose
Corrugated metallic tubing capable of being bent easily by hand a limited number of times. May be covered with a non-metallic outer sheath by the manufacturer at the time of production.

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

Note: Normally, cranking continues after ignition, assisted by power from the established flame until a certain critical speed is attained at which the engine becomes self-sustaining. Cranking may be performed by various methods, the most common being the use of electric starter motor or hydraulic drive.

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.

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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/crossing work
Installation in which the primary purpose is to provide one or more passages beneath an obstruction, typically adopting a trenchless technique crossing a road, railway or watercourse.

crown
Sheet metal top of a water sealed gasholder.

cup, relating to a water sealed gasholder
U-shaped seal at the bottom of a lift which allows a water sealed connection to be made to the next lift.

cup blocks (or dip blocks), relating to a water sealed 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 water sealed gasholder cup.

cupping (and uncupping), relating to a water sealed 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 water sealed gasholder descends, to prevent over-extraction of gas.

cuttings
The elements of the "formation", cut away by the tooling and transported out of the bore by the drilling fluid when carrying out trenchless excavation.

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.

D

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

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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".

Note: Normally taken as 1000 thermal dose units, $(kW\ m_3)^{4/3}s$.

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.

delivery pressure
The pressure at which the gas is delivered to the vehicle.

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. However, where specific constraints apply which creates traffic congestion, consideration needs to be given to defining lower traffic densities which result in the road being at full capacity as dense.

design appraiser
A person who is technically competent in an appropriate professional discipline. The Appraiser is demonstrably independent of the work to be appraised.

design approver
An engineer with the relevant competencies to approve a design that meets the requirements of the design brief, Legislation, Standards and is safe. They are responsible for the design check. Ultimately, they are responsible for and take ownership of the design or for multi-discipline projects that form part of the design which they have approved.

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 organisation
The person or organisation who undertakes the design stage of a project.

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design output package
The set of checked and approved drawings, calculations and other documentation required for the specification and construction of the Asset.

design pressure (DP)
Pressure on which design calculations are based.

Note 1: From a pressure integrity perspective, DP is determined by the pressure rating of the lowest performing component within the pressure system and which will be equal to or greater than the maximum incidental pressure (MIP).

Note 2: Design pressure is the target MOP.

Note 3: Design pressure will be greater than or equal to MOP.

design temperature
Temperature on which design calculations are based.

design temperatures
The range of temperatures (min to max) that a section of pipework could experience in operation.

design validation
The process by which the asset owner checks whether the design will meet their needs.

detailed design
This is the process of developing the required drawings, calculations and associated documentation to achieve the objectives of the design brief.

detergent
A "fluid additive" which may be used to produce required properties in a "drilling fluid", for example, to stop clay sticking to "downhole tooling".

device
A single component, or collection of a small number of components, in a sealed enclosure. May include, for example, a zener barrier, a transistor, a reed switch, an optical reader, etc.

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.

diameter (nominal bore (NB), nominal diameter (Φ), inside (internal) diameter)
Pipes and fittings are specified differently dependent upon material, legislation, Standards and Specifications, with respect to diameter.

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

diethylene glycol (DEG)
A gas conditioning agent used to swell the yarn in lead/yarn joints.

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).

digging shield
A protective structure used during excavation of tunnels to prevent soil collapse on personnel or equipment prior to installation of the permanent tunnel lining.

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dilution purging
Purging to a specified endpoint with maximum mixing of incoming and outgoing gases.

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

dip, relating to a water sealed 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/horizontal directional drilling (HDD)
Steerable system for the installation of pipes, conduits and cables in a shallow arc using a surface-launched drilling rig, usually in conjunction with a tracking or guidance system.

disconnect
Prevent the operation of a gas appliance or gas installation through the physical disconnection of the gas supply from the appliance/installation and sealing off the supply using a plug, or cap, or by spading off.

dispenser
The equipment through which the CNG is supplied to the vehicle.

displacement purging
Purging to a specified endpoint with minimal mixing of incoming and outgoing gases.

distribution main (main)
Pipeline through which a gas transporter (GT) or gas conveyor is conveying gas for consumption at multiple downstream locations. A distribution main is part of the Network.

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

distribution main valve (DMV)
Valve (other than an 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.

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domestic utilisation sector
Those premises containing gas installations which are downstream of the Natural Gas Network or LPG installation emergency control valve other than non-domestic premises.

domino effect
Incident escalation due to the original incident affecting other dangerous substances.

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 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.

down the hole hammer (DTHH)
An air-driven percussive drill, similar to that used for quarrying work, which is adapted for use in HDD operations. Typically employed in stony ground or rock, often used in conjunction with a "bent sub".

downhole
Anything existing or happening, within the length of a trenchless bore.

downhole tooling
Tooling designed to work within the trenchless bore, as opposed to above ground – transmitters, pilot tools, mud motors, reamers, swivels, etc.

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/head, 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
A length of steel tube with a thread at each end, which when joined to another, is used to advance a tool through a bore.

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

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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 electronics, and to lubricate the passage of the pipe during trenchless excavation.

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.

dryer
System which decreases the water content of NG.

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

duty holder
Person or organisation having responsibility in law.

dwelling, relating to multi-occupancy buildings
Individual residential premises within a larger building.

E

e & E
If the thickness E of the plate exceeds the thickness e of the orifice, the plate will be bevelled on the downstream side. The bevelled surface will be well finished.

E-methane
A methane-rich synthetic gas produced by combining hydrogen derived from non-fossil or low-carbon energy sources with carbon dioxide, carbon monoxide or other suitable carbon sources through methanation or equivalent processes. Carbon sources may include biogenic carbon dioxide, direct air captured carbon dioxide, post-combustion captured carbon dioxide, or other recycled carbon streams.

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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
Secondary stress is self-limiting in that it will reduce as a result of distortion, i.e., deformation controlled. Elastic follow up refers to instances where the elastic displacement is 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, including electronic, for example volume conversion devices, data loggers and optically coupled equipment.

electrical and instrumentation engineering
The design, installation, testing and commissioning of all electrical and instrumentation equipment plant and systems which protect and support production, transmission, distribution and storage installations.

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

emergency works
Works required to end or prevent circumstances, either existing or imminent, that might cause damage to people or property.

encapsulation
External leakage repair method for joints.

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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.

enclosure
A space in which an appliance(s) is installed, which is not large enough to enter to perform work other than maintenance via external access.

encroachment
An activity identified that if allowed to develop could affect the integrity of an asset or associated installation.

end fitting
Component permanently attached to a corrugated hose that allows gas-tight connection to other pipework, and either a nut and liner, a nipple end or flange.

energy sources
All fuels and all forms of motive power supplies.

enrichment (of biomethane)
Increase in the calorific value (of biomethane).

entry/exit
Angle at which the drill string enters or exits the ground in a directional drilling bore.

entry pit/launch pit
An excavation at the start of a trenchless bore to allow tooling to enter below surface.

entry side
The side of the HDD bore where the HDD rig is located, also known as the "rig side".

Environmental Health Officer (EHO)
Officer or appropriate person within a Local Authority, etc. having powers to approve chimney systems and their emissions.

equipment
Metallic parts and assemblies joined together by pipes and components, for example regulators, valves, compressors, and pumps.

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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.

error
A measured quantity value minus the true value. The true value is often agreed by convention or from a nationally or internationally agreed standard. Wherever possible, a measurement is expected to be corrected for an error.

escape distance
Closest distance at which people moving away from the fire receive less than the dangerous dose without resort to shelter.

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

evaluation
Measuring the effectiveness of learning.

event tree
Provides a systematic way of identifying all 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.

exit pit
Excavation at the end of a trenchless bore to allow tooling changes and pipe entry below ground level.

exit side
The side of an HDD bore from which the pipe will be pulled back. Also "pipe side".

expanded measurement uncertainty
Product of a combined standard measurement uncertainty and a coverage factor (k) larger than the number one. The most common value of coverage factor is k = 2; this gives a 95% level of confidence for a normal distribution.

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.

expansibility (expansion) factor (ε)
A coefficient used to take into account the compressibility of a fluid.

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

experienced competence expert
Person who is occupationally competent in the task being assessed and is familiar with the competence assessment requirements.

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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.

F

face support
A method of preventing the collapse of the excavated face during tunnelling operations.

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

failure cause
Reason for a pipeline reaching a "limit state".

Note: Examples are external interference, external corrosion and growth of defects due to fatigue.

failure mechanism
A potential cause of pipeline failure, for example corrosion, external impact, overpressure etc.

failure probability
The likelihood that one or more failure mechanism will occur.

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.

fast-fill
Filling operation which is comparable in duration to that of liquid fuel.

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feasibility study
Identifies a number of solutions to the project requirements with appropriate cost/benefit analyses for further consideration by the user. Some of these ideas will be unsuitable for development and will be discarded before the next stage. Hazard Identification Studies (HAZID) and other safety assessment studies need only be undertaken at this stage as appropriate to support any cost/benefit issues. The need for a feasibility study is dependent upon the user's requirements.

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

filter cake
An outer layer formed by trenchless drilling fluid, protecting the circumference of the bore, preventing ingress of ground water, or egress of drilling fluid. Field testing allows for the quality of this to be assessed during fluids preparation for more critical projects. This testing equipment is not commonly used on smaller projects. Also known as "wall cake".

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.

filter press
See "half area filter press".

filtrate
Drilling fluid, or the water phase from it, lost to the formation during works. It is desirable to keep this to a minimum for best results.

fire wall
Wall, screen or separating partition erected in the open air to reduce the effects from radiated heat and to ensure an adequate dispersion distance for CNG leaking from any vessel.

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).

flame supervision device (FSD)
A device that, in response to a signal from the flame detector, keeps the gas supply open and shuts it off in the absence of the supervised flame.

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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.

flexibility factor (k)

The introduction of pipe bends or branch junctions into a piping system results in the occurrence of additional flexibility. For bends, k is the ratio of the rotation that occurs between the bend ends to that which occurs between the ends of a straight pipe of identical length as the bend. For branch junctions, k is the additional rotation, expressed as an additional fictitious length of branch pipe with a rigid juncture that occurs at the branch junction.

flooding holes, relating to a water sealed 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

A passage for conveying the products of combustion from a gas appliance to the external air and includes any part of the passage in a gas appliance duct which serves the purpose of a flue.

flue additives

The various elements added to "make up water" to produce a suitable "drilling fluid".

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.

fluids recycling

A means of removing the "cuttings" from the "fluid returns" so that the fluid may be reused for trenchless operations.

fluid returns

Drilling fluid, coming back out of the bore to the entry, exit, or interim pit, transporting the "cuttings".

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fluid viscosity
Defined as the "resistance to flow" of a fluid.

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.

footprint (HDD operations)
The total length and width required to establish a drill rig, from the back of the drill rig to the point at which the drill string hits ground level. Length must include for any extension behind the rig of the hydraulic hose chain. Width must include for any extension of rod loading arms and guard. The operating footprint length is added to the "setback" when calculating space required to establish for a bore.

forced draught burner
Burner in which the combustion air is provided under pressure.

formation
The surrounding ground "formation" through which a bore passes.

frac out
See hydrofracture / inadvertent returns / blow hole / breakout

free area
The total area of the individual unobstructed openings of an air vent.

free handle 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 or installed outside.

fuel gas
Any combustible gas or mixture of gases.

"Fulham" nozzle
A specially shaped metal fitting used to join flexible pipework.

fumes
Products of combustion.

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.

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G

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 appliance
An appliance designed for use by a consumer of gas for heating, lighting, cooking or other purposes for which gas can be used but it does not include a portable or mobile appliance supplied with gas from a cylinder, or the cylinder, pipes and other fittings used for supplying gas to that appliance.

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 conditioning equipment
Equipment to filter and/or remove unwanted constituents (moisture, debris, liquid and vapours) from the gas either prior to or after compression.

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

Note 1: There cannot be a gas conveyor on pipe designated as installation pipework.

Note 2: The Gas Act 1986 Schedule 2a, paragraph 1a permits a landlord to be a gas conveyor without a gas transporter's licence. However, they would still be required to comply with GS(M)R (unless that pipework is adopted formally by another upstream conveyor); PSR and GS(I&U)R.

gas detector
Instrument used for the detection of gas concentration.

gas engineer
Any person who installs, purges, commissions, tests, services, maintains, repairs, disconnects, modifies and dismantles gas systems, fittings and appliances whether they are an employee, self-employed or working on their own behalf.

gas fitting
Gas pipework, valves (other than the 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.

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

gas installation
Gas pipework, valves (other than emergency controls), regulators and meters and fittings, apparatus and appliances designed for use by consumers of gas for heating, lighting, cooking or other purposes for which gas can be used (other than the purpose of an industrial process carried out on industrial premises) and gas storage vessels.

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

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

gas (process) engineering
The physical processes applied to the gas during transportation and the different characteristics of different gases such as NG, LNG and LPG. This will include filtration, preheating, metering, local gas treatment, pressure regulation and expansion, compression and other processes. It is not intended to include the physical availability of the gas supply for a particular application.

gas processing facility
Any gas processing facility which –
(a) blends or purifies gas, removes from gas any of its constituent gases or separates from gas any oil or water; and
(b) is situated at a terminal which receives gas directly or indirectly from a gas production facility.

gas producer
A person who—
(a) gets natural gas from its natural condition in strata, otherwise than as an unintended consequence of the storage of gas, and requires a license under section 3 of the Petroleum Act 1998 (licenses to search and bore for and get petroleum) to do so or would require such a license if getting the gas in Great Britain; or
(b) produces any other gas, which is suitable for conveyance through pipes to premises.

gas production facility
A facility for the extraction of gas from strata or for the manufacture of gas.

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 storage vessel
A 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.

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 will 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), ECV, meter installation and installation pipework and any AECV to supply a consumer's appliance. In certain circumstances the gas system may also include the ventilation and chimney/flueing systems.

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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.

gas work
All or any of the activities listed that the gas engineer works on or carries out see "gas engineer" (definition).

gasholder heating
Heating that prevents water freezing in the cups of a water sealed 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 water sealed gasholder representing a state of complete deflation and where all lifts are supported on the rest blocks.

grouting
Method of filling voids, usually in the case of HDD, with chemical grout. Process sometimes used to ensure abandoned bores do not lead to excess ground settlement.

guidance note 8
Details the entry routes to ACS assessment and the requirements for extending scope or range of work.

guidance system
A system used to monitor the progress of a "pilot bore". See "wireline" "gyro" or "walkover" guidance systems.

guide rollers, relating to a water sealed 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.

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

guided learning hours
Off-site learning supervised by a trainer, which can be supported:

- classroom based learning supervised by a Trainer
- work-based learning supervised by a Trainer
- live webinar or telephone tutorial with a Trainer in real time
- e-learning supervised by a Trainer in real time
- all forms of assessment which take place under the immediate guidance or supervision of a Trainer.

gyro guidance system
A form of "wireline" guidance system used in HDD drilling that uses powered gyroscopes to provide very accurate data and not affected by magnetic interference (from electric fields, steelwork, iron ores etc.). An alternative to "magnetic guidance systems". As with most "wireline" systems, it is common for a specialist "steering engineer" to control this type of system.

H

half area filter press
A test instrument used to test the quality of "filter cake" of a drilling fluid. Can be used in field tests but not often seen on smaller projects.

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 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.

hazard range
Distance from the release point or source of hazard to a defined level of harm or type of hazard. For pipelines, this refers to a distance from the pipeline beyond which the risk of injury from the worst credible pipeline failure would be of no concern.

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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.

heave/surface heave/ground heave
Forced lifting of the ground surface, or unwanted loading on existing buried plant in proximity to the bore. Either due mechanical displacement of the soil or escape of drilling fluid into the "formation".

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
High density traffic routes include:
a) all motorways
b) all roads that carry a volume of traffic totally, in both directions, 2000 vehicles per hour and above, for periods of at least 10 hours per week. The 10 hours may be spread evenly over the week or may be concentrated into set periods. On dual carriageway roads which carry less than this number, consideration needs to be given to future growth.
c) all dual or multi-track rail routes with an average of more than 4 trains an hour, in either direction, measured over the busiest 8 hour period in any one day.

high operating load
This is the maximum operating load for the entire gas installation in the premises for a period of high demand. To replicate this, operate:

- the highest output appliance (typically the boiler) operating at its maximum load (For combination boilers, this will be hot water demand to taps, in which case operate all hot taps at full flow)
- and any other appliances at 50% load e.g., hob with 4 burners only 2 are lit.

high pressure
Operating pressure exceeding 7 bar gauge.

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high pressure stage (LPG)
That part of the LPG installation between the take-off valve of the bulk storage vessel or cylinder and the inlet of the 1st stage regulator. For Propane, the pressure will be in the region of 6.9 bar. For Butane, the pressure will be in the region of 1.93 bar. These pressures may vary dependent upon ambient temperatures.

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.

housing (as in "meter housing")
A purpose-built building, including those of brick construction and pre-fabricated glass reinforced plastic boxes/buildings, that contain gas metering equipment.

Note: Part of a housing's construction may include the wall, or walls, of an adjacent building.

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.

hydrofracture
A failure of the "formation" due to hydraulic forces developed by excess fluid pressures "downhole". Pressure causes a fissure to develop which propagates to the surface, usually, close to the line of the bore, leading to "inadvertent returns".

I

ignition period
Period during which a start-gas flame SSOV is permitted to be open before a check is made for the presence of the start-gas flame.

immediately dangerous (ID)
An appliance/installation, which if left connected to a gas supply is an immediate danger to life or property.

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.

inadequate ventilation
Any means of ventilation that is sufficient to ensure that a gas concentration in excess of 50% LFL is unlikely outside of the classified zone(s).

inadvertent returns
Drilling fluids / slurry coming to the surface where it is not intended. This may be due to "hydrofracture" or due to loose fill or fissures already existing in the "formation". This may occur some distance away from the line of the bore, or some distance behind the current position of the tooling.

inclination
Angle of a "pilot tool" from the horizontal. See "pitch".

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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 contour
A line along the route of the pipeline connecting points with an equivalent level of risk. For a straight pipeline with uniform geometry, material and operating parameters, this will be parallel to the pipeline, but its distance away from the pipeline can vary as those parameters change.

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 risk transects
A graph showing the variation of risk with distance from the pipeline, in a horizontal direction and perpendicular to the pipeline. Transects can vary along the pipeline route as the geometry, material and operating parameters change.

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.

industry recognised
The Standards Setting Body (SSB) is required to recognise all training for developers/providers wishing to provide training for new entrants working under the GS(I&U)R and for training providers wishing to become recognised to offer training for those working outside the scope of GS(I&U)R.

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

inferential device
A device that infers a measured value from data collected by measuring instruments.

infiltration
Water from the surrounding "formation" which enters the bore, diluting drilling fluids and having a detrimental effect on bore integrity.

information only
Those submitted at the planning stage of works, generally before the full scope of works and start and end dates are known.

infringement
An activity that breaches the terms of an agreement (e.g., easement).

initial defect size
The maximum size of defect (or the distribution of actual sizes of defects) which could be left in the pipeline following the commissioning hydrotest.

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

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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, not being an ECV and always installed upstream of an ECV, to enable isolation of gas to all parts of a building, by an authorised party.

inlet supply pipework
The pipework section upstream of the compressor.

inner lift (first lift or top lift)
Inside lift of a water sealed gasholder, having the smallest diameter, and carrying the crown.

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
Installation pipework is any pipework downstream of an ECV, for conveying gas for a particular consumer and any associated valve or other gas fitting, including any pipework used to connect a gas appliance to other installation pipework and any shut off device at the inlet to the appliance, but it does not mean:

- a service (pipe)
- a pipe comprised in a gas appliance
- 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.

integrated liner
A regulator designed with an outlet connection for direct connection to the meter.

interconnector
A pipeline used for the conveyance of gas to Great Britain from another country.

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

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

intermediate lift (middle lift(s))
Lift(s) of a water sealed gasholder between the inner and outer lifts.

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

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intermediate pressure stage (LPG)
That part of the LPG installation between the outlet of the 1st stage regulator and the inlet of the 2nd stage regulator. For Propane, the pressure will be in the region of 750 mbar. Also known as medium pressure stage

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.

intersect HDD bore
Longer drilling profiles can be achieved by the use of two drilling rigs boring from opposite sides and intersecting one another at a defined point.

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.

ISO container
An LNG tank that is mounted in a frame, is attached to the carrying vehicle by "twist locks" and is designed to be lifted from the carrying vehicle whilst full.

J

jacking pipe
A structurally designed pipe section that is used to push a digging shield or micro tunnel boring machine through the ground whilst supporting the external loading. Is also used a conduit or carrier for the product pipe or utility apparatus.

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

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

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.

jetting
Method of drilling using a combination of mechanical drilling and pressurised fluid to assist in either cutting or excavating the formation. Also "fluid assisted".

K

king post
Resting place for the centre of the crown framework within a water sealed gasholder tank.

kit
Main assembly and all associated components needed to complete a medium pressure (to low pressure) 6 m^3 h^{-1} meter installation, apart from the meter and meter box.

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knowledge and understanding
Knowledge refers to facts and information; understanding involves grasping the meaning and significance of that information, allowing deeper comprehension and application.

L

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.

large domestic
A domestic premises with a supply greater than 20 m^3/h.

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. For HDD usually referred to as "entry pit" or "launch drift". For micro tunnelling, pipe-jacking or auger boring this may be referred to as a "thrust pit or shaft".

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 SSOV system is not leaking by the application of a pressure or vacuum between the SSOVs.

leakage survey
Systematic search for escapes of gas.

learner
A person (new entrant) learning a subject or skill.

legacy ECV
An ECV incorporating an outlet thread that does not conform to BS EN ISO 10806.

legacy gas supply arrangements
Configurations that are not consistent with the installations defined in IGEM/G/1 as being standard gas supply arrangements.

legacy meter owner
The owner of an installation which was originally installed by a GT prior to 2004 in a configuration not consistent with "standard gas supply arrangements". And which has not been updated to meet the "standard arrangements".

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LF transmitter
Generic term meaning the device connected to the gas meter that provides electrical pulse outputs directly proportional to the actual volume passed by a gas meter. For example, 1 pulse represents 1 unit of volume.

Note: LF is typically up to 1 Hz (HF is typically up to 5 kHz).

lift
Telescopic section of a water sealed gasholder.

lighting torch
Hand-held burner ignited outside a combustion chamber.

light steel frame
Frame structures constructed from cold-rolled galvanised steel.

limit state
The state of the pipeline when it no longer satisfies a particular design requirement, see "ultimate limit state".

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

line work
Where an HDD drill path follows along the line of a road, track or path as opposed to crossing a geographic feature or obstruction. May also include drilling along or across fields or other open ground.

liquefaction
A phenomenon in which the strength and stiffness of the soil is reduced by earthquake shaking or other rapid loading.

Note: Liquefaction occurs in saturated soils, that is, soils in which the space between individual particles is completely filled with water. When liquefaction occurs, the strength of the soil decreases and the ability of the soil to support pipeline assets or other components is reduced.

liquid separator
Device which causes any liquids within the gas to drop out of suspension for collection and can be located after compression of the NG.

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 water sealed 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.

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locator
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.

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.

lodge
An alternative term for a holiday caravan or a residential park home.

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.

lost circulation
Interrupted flow between downhole tooling and entry or exit pit. If not quickly noted and corrected, will lead to "Frac Out" and/or stuck pipe.

lost circulation material (LCM)
A material pumped "downhole" with drilling fluid in order to try to recover "lost circulation" by sealing voids in the "formation". Can usually only be effective on deeper bores.

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 (LP)
Maximum operating pressure of the gas supply at the inlet of the regulator not exceeding 75 mbar.

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.

low pressure stage (LPG)
That part of the LPG installation between the outlet of the 2nd stage regulator and the gas appliance(s). For Propane, the nominal operating pressure is 37 mbar. For Butane, the nominal operating pressure is 28 mbar.

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lower flammable limit (LFL)
The concentration of flammable gas, vapour or mist in air, above which combustion can be sustained.

lowest operating pressure (LOP)
Minimum pressure which a system is designed to experience under normal operating conditions.

LPG
A low-pressure liquefied gas composed of one or more light hydrocarbons, which are assigned to UN Nos. 1011, 1075, 1965, 1969 or 1978 only and which consists mainly of propane, propene, butane, butane isomers, butene with traces of other hydrocarbon gases. LPG assigned to UN Nos. 1075 or 1965 may also include not more than 12% dimethyl ether by mass.

M

magnetic guidance system
A form of "wireline" guidance system that uses the earth's magnetic field, or an artificial field from a guidance cable, to survey the pilot bore position. An alternative to "gyro Systems".

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 assembly
Factory assembled main part of a kit comprising a filter (either within the regulator or externally), regulator, vent pipe, meter inlet valve, and (in some kits) pipework to connect to the ECV.

main body
Lower part of the casing containing gas and including, in the case of the type B regulator, the base plug.

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 flue
For a short duct, that part of a shared 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.

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major injury

- any bone fracture diagnosed by a registered medical practitioner, other than to a finger, thumb or toe;
- any injury diagnosed by a registered medical practitioner as being likely to cause permanent blinding or reduction in sight in one or both eyes;
- any crush injury to the head or torso causing damage to the brain or internal organs in the chest or abdomen;
- any burn injury (including scalding) which –
  a) covers more than 10% of the whole body's total surface area; or
  b) causes significant damage to the eyes, respiratory system or other vital organs;
- any degree of scalping requiring hospital treatment;
- loss of consciousness caused by head injury or asphyxia; or
- any other injury arising from working in an enclosed space which –
  a) leads to hypothermia or heat-induced illness; or
  b) requires resuscitation or admittance to hospital for more than 24 hours.

makeup water
The water used as the basis for a "drilling fluid" (mud).

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.

marsh funnel
A special funnel designed to measure the "viscosity" of drilling fluids. Used in conjunction with a "measuring jug", a Marsh funnel test is the simplest way of checking basic fluid properties.

marsh funnel viscosity
The "viscosity" of a fluid as measured in a marsh funnel test, expressed in seconds. Typical results may be between 40-80 seconds.

maxi rig
The largest type of directional drill, only used on major works where very high torque and pullback forces may be required.

maximum appliance load
This is as specified by the Manufacturer in the commissioning instructions e.g., commissioning/chimney sweep mode, or where not specified the appliance is operating at its maximum appliance load e.g., hot water mode on a combination boiler.

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.

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maximum permissible bias (MPB)
Mean error and ideally is expected to be as close to zero as possible, when errors are determined at agreed combinations of operating conditions.

maximum permissible error (MPE)
The maximum (absolute) error that is expected to be displayed by the metering system, when errors are determined at agreed combinations of 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.

measurand
Item being measured.

measurement bias
Estimate of a systematic measurement error.

measurement uncertainty
Non-negative parameter characterizing the dispersion of quantity values being attributed to a measurand, based on the information used. The measurand is the item being measured. An uncertainty has a range and an associated probability.

measurement while drilling (MWD)
Instrumentation in a bore that provides continuous data simultaneously with drilling operations, usually transmitting to a display at or near the drilling rig.

measuring jug
A graduated (usually plastic) jug specifically designed for use in a "marsh funnel" test.

mechanical engineering
The discipline that applies the principles of engineering, physics and material science for the design, analysis, installation and maintenance of the pressure containing plant, equipment, pipework, etc. which form the physical pressurised system.

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.

medium pressure (MP)
A gas supply with a MOP exceeding 75 mbar and not exceeding 2 bar.

melt bead
Lip of PE displaced during butt fusion of pipe.

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mentor
A technically competent, Gas Safe registered person with suitable industry experience, holding relevant competencies, who provides on-site support and advice to the new entrant whilst building evidence for their portfolio, during the programme duration.

mentoring
A person(s) with the appropriate knowledge and experience supporting the new entrant in their training.

meter asset manager (MAM)
Organisation that works on behalf of the supplier and/or meter owner and is responsible for ensuring the design, installation, commissioning, maintenance, removal and disposal of gas supply primary meter installations is performed by suitably qualified persons or organisations in accordance with industry Standards and Legislation.

Note: The meter asset manager may be the meter owner.

meter bank
Group of meters in the same location.

meter by-pass
Pipe and associated gas fittings used to supply gas to a consumer without passing through the meter.

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

meter examiner
As defined in the Gas Act 1995 and MID - 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 gas supply.

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 valve (MIIV) primary meter installation to shut off the supply of gas.

meter installation kit
Includes a meter regulator, flexible meter connector, meter liners, fittings, and any associated meter brackets, union washers, shear bolts and security washers.

meter installation outlet valve (MIOV)
Valve fitted downstream of all the other components of a primary meter installation to shut off the supply of gas through a primary 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.

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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.

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

micro-tunnelling
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.

mini-rig
The smallest size of directional drilling rig, typically used for "line work". 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 CNG storage unit
Pressure vessel (multi-element gas container (MEGC) or battery vehicle (tube trailer)) used for the transportation of CNG to other fuelling stations.

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

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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.

monoethylene glycol (MEG)
A gas conditioning agent used to swell the yarn in lead/yarn joints.

more than adequate ventilation
Any means of ventilation that is sufficient ventilation to ensure that a gas concentration in excess of 10% LFL is unlikely outside of the classified zone(s).

motor drilling
The technique of using an HDD "mud motor" to drill rock or "overburden" containing hard clay, cobbles or boulders. Used with maxi rigs and, less commonly, with midi rigs. Alternative methods are "dual rod" rock drilling systems and "down the hole hammer" systems.

micro tunnel boring machine (MTBM)
An automated method of tunnel excavation controlled remotely, usually from the surface.

mud/drilling mud
The term commonly used by drillers to refer to "drilling fluids".

mud balance
A simple instrument used to measure the "mud weight" of both fluid returns, and recycled fluid, to determine the efficiency of the fluid system. Usually only seen on projects where "fluids recycling" is being employed.

mud engineer
A specialist in "drilling fluids" who may be responsible for maintaining the desired properties of drilling fluids on larger scale works.

mud motor
A motor "downhole", powered by the flow of HDD drilling fluid which rotates a drill bit. Due to the amount of fluid required to drive the motor, "fluids recycling" is almost always employed on projects using mud motors. Not commonly used on "line work" or smaller crossings unless in rock.

mud weight
Effectively the "specific gravity" of a drilling fluid in new, used, or cleaned condition. Typically, the higher the "mud weight", the more "cuttings" are within it.

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.

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N

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.

natural ventilation
Ventilation through an enclosed space where the flow of air is motivated by wind and/or buoyancy.

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
The 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 GS(M)R.

Note: "The Network" and a network are terms described and used in GS(M)R. A "network" is a specific part of the "Network" and is operated by a single undertaking.

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.

network emergency co-ordinator
An independent industry role established under GS(M)R, responsible for coordinating actions across the gas network to prevent or minimise the consequences of a Network Gas Supply Emergency.

network operator
The organisation responsible for the gas supply to a trial.

new entrant
A person who does not hold relevant gas qualifications, has not received recognised training and wishes to achieve a recognised industry qualification.

nipple end
End fitting in the form of a short length of tube with one end having a BS EN 10226 R thread.

no perceptible movement
A movement of 0.25 mbar or less on a fluid (water) gauge is considered to be "not perceptible". Therefore, if the gauge is seen to move, it can be inferred that the pressure within the installation has altered by more than 0.25 mbar. It follows that, where a gauge that can register perceptible movement of less than 0.25 mbar i.e., an electronic gauge, is used, the pass criteria of "no perceptible movement" has to be considered to be a maximum of 0.25 mbar except for those gauges that read to one decimal place when "no perceptible movement" is considered a maximum of 0.2 mbar.

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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.

no-flow
A flow condition below the normal proven air-flow device setting that provides a reliable and repeatable no-flow or low-flow signal from the flow device to the safety control 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-domestic utilisation sector
Those premises containing gas installations which are downstream of the Natural Gas Network or LPG installation emergency control valve other than domestic premises.

non-hazardous area "safe"
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.

O

off-site
An environment outside of the workplace e.g., training centre.

'Off the job' training
Training that is undertaken in a classroom or workshop (which may be indoor or outdoor).

Ofgem approved meter installer (OAMI)
Obsolete term, see 'approved meter installer'.

Ofqual
Regulator of qualifications, examinations and assessments in England and vocational qualifications in Northern Ireland.

oil filming, relating to water sealed gas holders
Oil pumped inside in an attempt to prevent gas contents from becoming wet because of evaporation of the tank water.

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on-site training
Training that is undertaken for a customer at the learner's place of work (it may be simulated in a workshop under certain limited conditions).

on-site work experience
Gas work carried out in the workplace with and under the supervision of the mentor.

'on the job' training
Training that is undertaken in a workplace such as an industrial or commercial premises (it may be simulated in a workshop under certain limited conditions).

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 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.

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 which occurs within the system under normal operating conditions.

Note: Operating Pressure can be referred to as Working Pressure.

operations centre
An organisation's facility for the management of reported gas emergencies received from the NGES.

operator PIV (of a gas pipeline)
(a) the person who is to have or (once fluid is conveyed) has control over the conveyance of fluid in the pipeline;
(b) until that person is known (should there be a case where at a material time they are not yet known) the person who is to commission or (where commissioning has started) commissions the design and construction of the pipeline;
(c) when a pipeline is no longer, or is not for the time being used, the person last having control over the conveyance of fluid in it.

operator's cabin
Separate control cabin where the driller sits controlling a larger drill rig or micro-tunnelling machine.

optioneering
Formal method for decision making.

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outage
Unexpected unavailability of plant which was believed to be available.

outer lift (bottom lift)
Outside lift of a water sealed gasholder, having the greatest diameter, moving closest to the walls of the tank.

outlet pipework
The pipework section downstream of the compressor.

outlet pressure
Pressure at the outlet of a component.

ovality
The amount by which a pipe may be out of round (the difference between the maximum and minimum diameter divided by the mean diameter at any one cross section of a pipe), generally expressed as a percentage.

overall length
Length of a connector measured across the extremities while it is lying straight on a flat horizontal surface.

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

overbreak
The unintentional removal of material from out with the intended bore of a trenchless excavation.

overburden
Any "formation" overlaying the original, predominant ground makeup in an area. "Man-made ground, and naturally deposited clays, and granular sediments that overly the bedrock. Termed "superficial deposits" by the British Geological Survey.

overpressure
Pressure above the maximum operational pressure.

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.

P

party wall
Wall between two adjoining dwellings or occupancies.

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

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.

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 drill
Often referred to as a Safe System of Work (SSoW) or Permit to Work (PtW). Formal written document used to control certain types of work that are potentially hazardous.

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

permitry
A generic term referring to any of the specific permitry forms and documents used to control specified works, for example: Routine Work Procedure, Form of Authority, and General Permit to Work.

perpendicular orientation
Where a regulator is so orientated that its second stage diaphragm is in the vertical plane.

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.

pillar box extension kit
Extension to a semi-concealed meter box that facilitates the installation of an ETM (electronic token meter).

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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.

pilot tool
The very first item down the hole during HDD "pilot boring". Includes the "drill bit", "guidance system" and any "mud motor" or "DTHH". The pilot tool provides the steering capability for the bore.

pipe
Includes a pipeline, distribution main, service pipe and any ancillary plant connected to a pipe and used for the conveyance of gas, but it does not include a pipe downstream of an emergency control.

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
The installation of precast / preformed pipe sections through the ground by hydraulic jacks to form a tunnel.

pipe pull/pullback
The final stage 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.

pipe side
The side of an HDD bore from which the pipe will be pulled back. Also "exit side".

pipeline
A pipe or system of pipes (including domestic gas services) for the conveyance of a fluid. There are exceptions, and these are detailed in the Pipeline Safety Regulations (Regulation 3). For the purposes of the Standard this definition of a pipeline does not include associated apparatus.

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

pipeline quality (gas)
Suitable for conveyance within a pipeline system (gas).

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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.

pitch
Deviation from horizontal level, expressed either as "degrees", or more commonly "percentage grade", where 45 degrees equates to 100% grade. Usually displayed by a screen at the "drill rig" or "operator's cabin" and clarified as "up or "down". – See "inclination" for "wireline" & "gyro" systems.

planned works
Works where the scope of works and start and end dates are known.

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

plant
A term covering all turbines, down-stream heating and energy recovery plant, burners, controls and pipework associated with the supply and combustion of fuel.

plumbing, relating to a water sealed gasholder
Measurement of columns to assess any changes in their position or alignment.

point of neutral pressure
Point below a SE-duct where combustion air enters the primary inlet to the SE-duct, for example a basement area or car park.

polymer
A common type of "fluid additive" used to enhance the properties of a particular "drilling fluid". There are many different types of polymer in use.

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

poor ventilation
Ventilation that is not able to reduce gas accumulation beyond 50% LFL and thus is a worse scenario than "inadequate ventilation".

portfolio
A collection of records which will be written, copies of documents, reports or test papers and photographs that is evidence of the work experience and/or work that the new entrant has undertaken.

possible
May occur.

post-purge
Purge which follows safety shut-down.

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pre-purge
Purge which precedes an ignition attempt.

Note: A flow of air or low temperature non-combustible gases through the system so as to displace completely any explosive mixture which may have accumulated therein immediately preceding an attempt to fire up the plant.

pre-ream
An HDD operation, employing a "reamer" which increases the size of an HDD bore but does not involve pulling pipe. It may be carried out in several stages, each increasing the size of the hole further.

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.

"Domestic premises" means premises occupied as a private dwelling (including any garden, yard, garage, outhouse or other appurtenance of such premises which is not used in common by the occupants of more than one such dwelling).

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

pressed joint
Joint in which tightness is achieved by making use of an appropriate tool for mechanically deforming a fitting, including a sealing element onto a metallic pipe in order to form a 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. A PRI comprises all pressure-containing and associated equipment between the upstream face of the PRIIV and the downstream face of the PRIOV.

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

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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 has 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.

pre ream
An HDD operation, employing a "reamer" which increases the size of an HDD bore but does not involve pulling pipe. May be carried out in several stages, each increasing the size of the hole further.

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.

profile/bore profile
The proposed or actual path taken by the bore. Often depicted in a diagram with a section, or side view, along with a plan view. Can be described by a plot of depths and distance.

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 SSOV with mechanical over-travel, which proves the SSOV to be in the fully closed position.

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proof stress (R_ρ)
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 or system that limits the amount of energy passing into a hazardous area from a non-hazardous (safe) area.

Note: It can take the form of a Zener barrier or galvanic isolation.

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.

pullback pressure
The pressure shown on a drillers gauge as the "drill string" is pulled back toward the "rig".

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

punch out
The point at which the HDD "pilot tool" exits the ground on completion of a pilot bore.

pup
Short make-up piece of pipe.

purchaser
Organisation that will take full responsibility for receiving and installing the meter installation component as defined in the contract.

purge
Displacement of one type of gas with another.

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.

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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.

push reaming
Where an HDD bore is enlarged as a reamer is rotated and pushed downhole away from the "rig", as opposed to pulled toward the rig" which would be more conventional.

Q

q_{max}
Maximum allowable flow rate through a meter, within specified accuracy limits. This flow rate is, normally, subject to legal metrological approval.

R

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.

rate of advance
Speed of advance of a trenchless bore through the ground, generally expressed as metres per hour or metres per day.

readily accessible
Something that can be quickly and easily reached for operation, maintenance, inspection or emergency without requiring any tools, moving obstacles, or taking significant risks.

reamer
An HDD tool or the process of using a tool for opening the hole to a larger diameter than the pilot bore. Also, back reamer.

reaming
An HDD tool or the process of using a tool for opening the hole to a larger diameter than the pilot bore which may be carried out in stages by a series of "passes".

reasonably foreseeable fault
A fault that could reasonably be anticipated and which the protective system is designed to successfully deal with such than an unsafe situation does not occur.

receive/reception pit/shaft
Excavation into which trenchless technology equipment is driven to and recovered from following the installation or renovation of the product (pipe, conduit or cable). For HDD usually referred to as "exit pit".

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.

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recogniser of training
Organisation recognised by the Authoriser to establish that the training delivered by the training provider meets industry specification.

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

re-fillable cylinder
A cylinder which is filled other than at the place where it is connected for use.

recovery vessel
Vessel that recovers gas from the compressor and its ancillaries and which may also serve to damp out pressure pulsations in the compressor inlet.

re-gasified
Change the liquefied natural gas back into a vapour.

regulator
Device which automatically controls pressure or volume flow at a selected point in a gas stream. When used in a metering installation this will refer to a device located in close proximity to a primary meter, which is solely to control the pressure of the gas within the gas meter and installation pipework. The regulator will be in the form of a combined factory assembled unit incorporating a regulator and integral safety devices, e.g. slam-shut valves or a meter installation excess flow valve (MIEFV).

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.

relevant main
Any distribution main which is being used for the purpose of giving a supply of gas to any premises in that area at a rate not exceeding 75,000 therms a year.

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 pipeline or other component to withstand the forces acting on it.

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

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responsible engineer (RE)
Suitably qualified, competent and experienced engineer appointed to be responsible for the execution and for approval of activities a designated by their employer.

responsible person
In relation to any premises, means the occupier of the premises or, where there is no occupier or the occupier is away, the owner of the premises or any person with authority for the time being to take appropriate action in relation to any gas fitting therein.

rest blocks, relating to a water sealed gasholder
Provision made to support grounded lifts which are fully immersed in the tank water.

returns
See "fluid returns".

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.

rheology
The properties of a drilling fluid which determines the fluid's ability to transport cuttings out of the hole and hold cuttings suspended within the liquid. Not to be confused with "viscosity".

rheometer
Instrument used to test the "rheology" of a fluid. Often used by a "mud engineer".

rig/drill rig
Common Term used to describe the machine carrying out HDD drilling.

rig side
The side of a bore where the "rig" and "entry pit" are located.

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.

'road going' leisure vehicle
A vehicle designed or adapted to provide living/sleeping accommodation, which is capable of being used on public roads e.g. motorhome or campervan.

roof terminal
For a short duct, a device fitted at the flue outlet to allow or assist products of combustion to escape, minimise down draught and prevent entry of materials which might block the flue.

rope-guided gasholder
Early form of water sealed gasholder in which the upper lift is guided by counterweights and pulleys.

rotational motor
Motor on a drill rig which rotates the drill string.

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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.

S

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)
The operating limits (incorporating a suitable margin of safety) beyond which system failure is liable to 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.

safe system of work (SSoW)
A safe system of work is a formal procedure which results from systematic examination of a task in order to identify all the hazards. It defines safe methods to ensure that hazards are eliminated, or risks minimised to an acceptable level.

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 distance
The separation distance between the fuelling station, its components and structures and other installations and structures in the vicinity for protecting people and property and reducing the degree of danger in the case of an incident.

safety engineering
The hazard and reliability aspects of gas transportation such as COMAH, risk analysis and assessment, HAZOP, HAZID, HAZCON etc. It is not intended, nor is it possible, that this is expected to indicate day to day site specific safety issues such as scaffolding and excavation registers, lifting equipment certification, COSHH etc.

safety measure
Any means that eliminates or reduces a risk.

safety report/safety case
Presentation of a justification for the safety of an installation.

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safety & engineering procedures
Safety and engineering procedures are used to manage activities that are of a repetitive or standardised nature and which do not require the risk mitigation controls used within PtW, NRO, RO and FoA.

safety shut-down
Shutting off of all gas and ignition energy.

safety shut-off system
System of 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.

scarfing
A raised ribbon of material (PE) produced to the side of a scratch or score which remains attached to the pipe.

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

Scottish Qualification Authority, Scotland
Regulator of qualifications, examinations and assessments in Scotland.

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).

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.

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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
Locations at which it may be difficult for people to escape, or which have concentrations of people who would have difficulty in escaping and/or with an increased sensitivity to thermal radiation. Examples of such developments are hospitals, convalescent homes, nursing homes, old people's homes, sheltered housing, schools, colleges, buildings with five or more storeys, large community and leisure facilities, large open-air gatherings.

sensor
Device that detects a change of physical parameter and generates an electrical signal corresponding to that change which can be read by an observer or electronic instrument, for example a photodiode which detects changes in light intensity or a reed switch which responds to changes in magnetic field.

service (pipe)
A pipe for distributing gas to a premises from a distribution main being a pipe between the distribution main and the outlet of the first emergency control downstream from the distribution main.

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 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).

service valve
a valve (other than an emergency control) for controlling a supply of gas, being a valve –
(a) incorporated in a service pipe; and
(b) intended for use by a transporter of gas; and
(c) not situated inside a building

setback
Distance required from the point at which the HDD drill string initially enters ground level to when it arrives at a pre-determined depth and pitch (does not include rig operating "footprint" which must be added to the setback to determine total distance required on site).

settlement calcs
A calculation carried out during the planning phase of critical trenchless works, where an estimate is produced as to how much the surface level may, or may not settle in the short, or longer term. May be mandated for by certain landowners and utility undertakers.

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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 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.

shipper
Holder of a licence from Ofgem to purchase gas from a gas producer, sell it to a gas supplier and employ a GT to transport the gas to the premises of the user.

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

shut-down
Shutting off all fuel and ignition energy.

sighting
An activity near an asset that has either been identified during a routine survey or from a public/employee report.

signaller
A person who directs traffic movements, commonly known as a banksman.

simple apparatus
Electrical components or combination of components of simple construction with well-defined electrical parameters which are compatible with the IS of the circuit in which it is used. The following apparatus is considered to be simple apparatus:

- passive components, for example switches, junction boxes, resistors and simple semi-conductor devices
- sources of stored energy with well-defined parameters for example capacitors or inductors, whose values are considered when determining the overall safety of the system
- sources of generated energy, for example thermocouples and photocells, which do not generate more than 1.5 V, 100 mA and 25 mW. Any inductance or capacitance present in these sources of energy are considered as in sources of stored energy.

Note: *It is the installer's responsibility to ensure all devices are supplied with appropriate manufacturer's certification and installed to the manufacturer's requirements.*

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.

site controller (SC)
Acts as a point of contact for those undertaking work on a manned site. The SC is responsible for internal and external co-ordination and communication, as well as conflict management for works related to their site. SC maintains a register of notified SCOS documentation and validates personnel competency who undertake those works.

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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
Tube installed through a bore, through which a pipeline will subsequently be inserted. May be installed to protect the pipeline from external damage, or to allow easier replacement of the pipeline in the future.

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.

smart meter
A gas meter which can send and receive information using an external electronic communications network; or a gas meter and a device which is associated with or ancillary to that meter and which enables information to be sent to and received by the meter using an external electronic communications network.

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.

soda ash
An additive used to reduce hardness and/or acidity in the "makeup water" to improve its suitability for use in HDD.

software
The design, installation, testing and commissioning of all software for electrical and instrumentation equipment, plant and systems which protect and support production, transmission, distribution and storage installations.

soil arching
Development of an arch shaped stable mass of soil above the crown of a bore that limits the volume of any soil collapse from the crown of the bore. The dimensions of the arch are primarily dependent on soil strength.

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

sonde
A small electromagnetic transmitter, often battery-powered, inserted inside a pipe or for trenchless excavation, installed inside the drill head. Its signal is picked up by a receiver, usually at surface level locate the below ground asset or to provide real-time tracking and guidance of the drilling tool. Also known as sonde transmitter or HDD transmitter.

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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.

special crossings
Installation to provide passage across features such as railways, tramways, motorways, bridges and waterways.

Note: Special crossings can be exposed or buried.

specified injury

- any bone fracture diagnosed by a registered medical practitioner, other than to a finger, thumb or toe;
- amputation of an arm, hand, finger, thumb, leg, foot or toe;
- any injury diagnosed by a registered medical practitioner as being likely to cause permanent blinding or reduction in sight in one or both eyes;
- any crush injury to the head or torso causing damage to the brain or internal organs in the chest or abdomen;
- any burn injury (including scalding) which —
    a. covers more than 10% of the whole body's total surface area; or
    b. causes significant damage to the eyes, respiratory system or other vital organs;
- any degree of scalping requiring hospital treatment;
- loss of consciousness caused by head injury or asphyxia; or
- any other injury arising from working in an enclosed space which —
    a. leads to hypothermia or heat-induced illness; or
    b. requires resuscitation or admittance to hospital for more than 24 hours.

spiral-guided gasholder
Water sealed 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.

spring housing
The upper part of the casing with breather hole and normally containing air but containing gas in the event of diaphragm failure.

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

standard conditions
NG that is at temperature of 15°C and a pressure of 1.01325 bar absolute.

standard dimensional ratio (SDR)
The ratio of minimum outside diameter of a PE pipe to the wall thickness. Calculated by dividing the specified outside diameter of the pipe by the minimum specified wall thickness.

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standard flow rate
Flow rate under specified reference conditions.

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

standard measurement uncertainty
Measurement uncertainty expressed as a standard deviation.

Standards Consultation Forum (SCF)
Ensures that employers and stakeholders allied to the gas industry are appropriately consulted as an integral part of the process of competence Standard setting arising from proposals to amend or introduce new assessment mechanisms and associated aspects for businesses seeking registration on the Gas Safe Register (GSR). For details contact IGEM.

Standards Setting Body (SSB)
Approved by HSE to develop and maintain the gas safety competence criteria for the proof of competence that leads to Gas Safe registration. Currently The Institution of Gas Engineers and Managers (IGEM).

stand off
Distance from which work or change is agreed in relation to the pipeline (this distance may be in excess of the easement).

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.

station owner/operator
The person who owns or is responsible for the operation of the fuelling station.

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.

steering engineer
An engineer on site whose sole responsibility is to monitor the progress of the trenchless bore and make relevant steering corrections. Usually only required for "wireline" or "gyro" work.

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.

stiction
The static friction that needs to be overcome to enable relative motion of stationary objects in contact.

storage
Any number of suitable CNG storage containers designed for the purpose of containing and subsequently releasing CNG.

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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.

Strategic Management Board (SMB)
Ensures that the mechanisms and processes established for the production, maintenance and implementation of competence criteria and associated assessment Specifications, operate in an effective and efficient manner to align fully with the Legislative requirements of the Gas Safety (Installation and Use) Regulations 1998 and subsequent Registration requirements for consumer safety. For details contact IGEM.

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.

stretch
The result of excessive pulling forces applied to PE pipe. The pipe will start to become elongated and suffer, temporary or permanent, reduced diameter over the affected section.

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.

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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.

structure
Any building and/or permanent assembly of equipment which will obstruct the free flow of air, for example pipe racks with greater than 50% cross sectional area blockage, vessels or tanks.

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.

sub-deduct arrangements
As described within the Uniform Network Code; Transportation principal document; Section G Supply Points Sub-Section 2.4 is an arrangement of pipes and meters, installed before 1st March 1996, which National Grid recognised on such date as being such an arrangement, by which a part of the gas which is conveyed by a system to premises for the purposes of supply to those premises, is further conveyed to other premises for the purposes of supply by those other premises.

Note: Supply in this context means as supplied by licensed gas supplier.

subsidiary flue
For a short duct, the part of a shared/common flue system that connects the appliance outlet to the main flue.

suffix$_c$
Pressures describing the performance of the consumer's system downstream of the meter installation.

suffix$_{mi}$
Pressure subjected to the downstream pipework by meter installation.

suffix$_u$
Pressure supplied by the upstream network.

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.

superficial deposits
Quaternary age (less than 2.6 million years old) from the most recent period of geological time. They are mostly unconsolidated sediments, such as gravel, sand, silt and clay. Formerly termed "drift", Superficial Deposits overlie bedrock.

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

Note: A separate air fan may also supply some air for flame stabilisation or additional firing needs. It does not operate independently of the turbine.

supplier
Holder of a licence from Ofgem to supply (i.e. sell to a consumer) gas by pipes to premises in GB through a primary meter.

Note: This definition is a variation of the legal definition taken from GS(M)R.

supply emergency
An emergency endangering persons and arising from a loss of pressure in a network or any part thereof.

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supply meter installation
The meter and associated equipment and installations installed or to be installed at a consumer's premises, including associated pipework, regulator filters, valves, seals, and mountings.

surface settlement
A trough developing at the surface above a trenchless bore, either during, or following drilling operations. See "settlement calculations" above.

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.

swivel
A device containing seals and bearings which connects the pipe to the reamer during HDD "pullback", allowing rotation of the reamer without transmitting torsional load to the pipe.

syngas
A methane-rich gas produced using the Sabatier reaction or equivalent process.

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

systematic measurement error
Component of measurement error that in replicate measurements remains constant or varies in a predictable manner.

T

T90 response time
For a sensor/transducer is the time taken for it to reach 90% of its final steady state output (or "indicated response"), whatever that might be, irrespective of calibration.

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.

Note: Where two regulators are arranged in series, the outlet pressure control pilots on each regulator are set at the same pressure so as to allow either regulator to rapidly assume control in the event of failure of the other regulator towards the open position.

tank, relating to a water sealed 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 water sealed gasholder.

technical appraiser
Person who is technically competent in an appropriate professional discipline.

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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.

test pressure
The pressure to which the installation or part of installation is tested. Different levels may be required for storage pressure vessels and other components.

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.

threat
A 'sighting' that has been confirmed as being unknown to the operator and therefore could affect the integrity of an asset or any associated installation.

thrust
Force applied to an HDD drill string, or pipe jack, auger bore or microtunnel pipes to advance a bore. Usually monitored on a hydraulic gauge.

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.

thrust wall
Structural wall behind a pipe jacking rig or rail mounted auger bore system to counteract the force required to progress the bore through the ground.

tie-in
Point where significant sections and sub-assemblies are finally attached to one another.

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tightness test
Test of piping or pipework for leakage.

tightness test permitted leak rate (TTPLR)
Leak rate permitted during a tightness test and which varies according to the test gas used and the test pressure.

tightness test pressure (TTP)
Pressure to be applied during a tightness test.

timed-fill
Filling operation which is not a fast-fill (see also fast-fill definition) and typically takes several hours.

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.

trailing rods
An HDD process used during a "pre-ream", where a "drill string" is pulled back through the bore behind the "reamer", to eliminate the risk of a lost bore by ensuring there is always a drill string through it. Usually, but not always (see "trailing live rods") with a "swivel" between the Reamer and the new drill string.

trailing live rods
As above, but without the use of a swivel. In this method, the "exit side" drill string will rotate above ground as the reamer is rotated by the "rig" and so stringent safety measures must be in place. This method is almost always used by maxi HDD rigs.

trainer
A technically competent person, delivering offsite training to the required training specification.

training developer
Organisation responsible for the development of training programmes meeting the requirements of IGEM/IG/1.

training provider
Organisation responsible for delivery of training programmes, that is approved by the Recogniser or Authoriser.

training specification
Produced by the SSB, the Training Specification outlines the criteria to which the training provider will develop and deliver their training programme.

transmitter
A device that emits a detectable signal used for underground locating or tracking (e.g., for sondes, beacons, HDD guidance).

transporter
A person who conveys gas through a distribution main.

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

trial operator
The organisation responsible for the coordination, management, conversion and operation of the trial.

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trip out
Withdraw an HDD drill string and tooling from bore (without cutting ground or pulling pipe).

tunnel annulus
The space between the internal bore of the tunnel lining and the external bore of the product pipe.

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 1st 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.

Note: In the event of a failure of the second-stage regulator a monitor override pilot will control the first-stage regulator to a setting marginally above the second-stage set pressure.

two-stage regulator
A regulator which breaks down inlet pressure to outlet pressure in two stages in order to give a compact design with good control of outlet pressure.

type A appliance (flueless)
An appliance not intended for connection to a flue or to a device for evacuating the products of combustion to the outside of the room in which the appliance is installed (from CEN TR 1749).

type A regulator
Regulator having connections of Rc¾ with the axis of the outlet vertical, as shown in IGEM/GM/PRS/3.

Note: BS EN 88 uses a similar term but for a completely different aspect of regulator performance.

type B appliance (open flued)
An appliance intended to be connected to a flue that evacuates the products of combustion to the outside of the room containing the appliance. The combustion air is drawn directly from the room (from CEN TR 1749).

type B regulator
Regulator having connections of Rc¾ with the axes of both connections in the horizontal plane, as shown in IGEM/GM/PRS/3.

Note: BS EN 88 uses a similar term but for a completely different aspect of regulator performance.

type C appliance (room sealed)
An appliance in which the combustion circuit (air supply, combustion chamber, heat exchanger and evacuation of the products of combustion) is sealed with respect to the room in which the appliance is installed (from CEN TR 1749).

type C regulator
Regulator having connections of Rc¾ with the axis of the inlet and outlet inline, as shown in IGEM/GM/PRS/3.

Note: BS EN 88 uses a similar term but for a completely different aspect of regulator performance.

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U

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. This limit state has safety and environmental implications. Examples are leaks and ruptures.

uncontrolled gas escape
A gas escape where it cannot be ascertained that the gas escape is controlled (usually attended within 1 hour).

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.

universal meter box
Multi-purpose meter box intended for installing either as surface mounted on a wall or semi submerged into the ground.

upgrading
Removal of carbon dioxide and contaminants from biogas or methanation of bio-syngases.

upright orientation
Where a regulator is so oriented that its second stage diaphragm is in the horizontal plane with the loading spring above the diaphragm.

upstand
A support post with or without a service riser and associated equipment (regulator meter, ECV, etc.).

usable range
Range claimed by a manufacturer.

user (under PSSR)
A nominated person representing the employer who has control of the operation of the pressure system and who ultimately will grant approval of the new work, modification or repair. In terms of PSSR this would normally be the User and in terms of EWR the duty holder.

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).

V

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.

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vehicle refuelling appliance
Self-contained system that compresses NG and dispenses the gas to a single vehicle fuel system via timed-fill.

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 pit
An excavation made specifically to reduce the distance drilling fluid needs to flow through the annulus. Can be used to reduce the risk of "frac out" and to reduce the amount of fluid needed on less critical projects by allowing heavier fluid returns.

vent valve
Valve having the same performance requirements as a SSOV and used as part of a SSOV proving system to prove the effective closure of the main SSOVs.

Note: It may be normally open or normally closed, depending on the design of the system.

villa
An alternative term for a holiday caravan or a residential park home.

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

V_z
A hypothetical volume associated with a gas release, within which the average gas concentration is 50% of the lower flammability limit (LFL).

W

walkover system
A locator system requiring the instrument to be positioned directly above a drill bit in order to confirm its position in plan and depth – as distinct from "wireline" systems (see below).

wall cake
In trenchless drilling, a lining that forms on the wall of a borehole when drilling fluid loses fluid to surrounding permeable ground. The wall cake has a high clay content and helps to seal and stabilise the bore. Also termed "filter cake".

washover pipe
Rotating drill pipe of larger diameter than the pilot drill and placed around it with its leading edge less far advanced. Its purpose is to provide stiffness to the drilling pipe in order to maintain steering control over long bores, to reduce friction between the drill string and the soil and to facilitate drilling fluid circulation.

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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.

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

water table
The upper level at which ground is naturally saturated with water.

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 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.

Welsh Government (Qualification Wales)
Regulator of qualifications, examinations and assessments in Wales.

wireline guidance system
A non "walkover" system, in which data is sent back to the surface via cables inside the drill string. This typically has the benefit of offering extended range over "walkover" systems, along with potential for reduced interference but has cost implications due to the need to make cable connections each time a rod is added or removed from the drill string. May also require a specialist "steering engineer" to monitor and control the direction of the bore. See also "gyro guidance system" and "magnetic guidance system".

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

(a) installing or re-connecting the fitting;
(b) maintaining, servicing, permanently adjusting, disconnecting, repairing, altering or renewing the fitting or purging it of air or gas;
(c) where the fitting is not readily movable, changing its position; and
(d) removing the 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.

workplace
An industrial or commercial premises or a simulated premise within a training establishment.

written scheme of examination (WSoE)
Specifies what parts of the system are to be examined, the nature of the examination, the preparatory work required if any, the frequency of examination, critical dates and the name of the Competent Person as defined in PSSR.

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Z

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.

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Institution of Gas Engineers & Managers (IGEM)
IGEM House, 26 & 28 High Street
Kegworth, Derbyshire DE74 2DA

t: +44 (0)1509 678 150
e: technical@igem.org.uk
www.igem.org.uk

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