

REGULATED QUALIFICATION FRAMEWORK (RQF)

QUALIFICATION SPECIFICATION

- **LCL Awards Level 3 Diploma Gas Utilisation Core Skills and Knowledge**

1. Objective:

The qualification allows learners to continue to learn, develop and practise the skills required for employment within the Gas sector. The objective of this qualification is for learners to demonstrate they know and understand key aspects of health and safety in gas utilisation, scientific principles used in gas utilisation, the combustion and properties of gas, buildings, services and structures and gas safety in accordance with legislation, regulations and industry standards and working practices.

The target groups for the qualification are those learners who are;

1. Preparing for employment, new entrants to the occupation
2. Existing personnel in the industry seeking to obtain a qualification to demonstrate their understanding and knowledge of gas utilisation.
3. Preparing learners for further learning or training and/or developing knowledge and/or skills in a work area of existing personnel seeking to extend their range of work

2. Qualification Framework:

The qualification comprises of 5 mandatory Units;

Unit Title	Unit Reference Number	Type of Unit	Level	Credit Rating
<u>Understanding Health and Safety in Gas Utilisation</u>	LCL-G3001	Knowledge	3	11
<u>Understanding Scientific Principles in Gas Utilisation</u>	LCL-G3002	Knowledge	3	4
<u>Understanding Combustion and Properties of Gas</u>	LCL-G3003	Knowledge	3	15
<u>Understanding Buildings, Services and Structures</u>	LCL-G3004	Knowledge	3	12
<u>Understanding Gas Safety</u>	LCL-G3005	Knowledge	3	15

Qualification Structure:

- **LCL Awards Level 3 Diploma Gas Utilisation Core Skills and Knowledge**
- **QAN – 600/8170/3**
- **QW – C00/1007/5**
- The Guided Learning Hours (GLH) are **470 hours**
- The Total Qualification Time (TQT) is **570 hours**
- The total credit required to achieve the qualification is **57**

3. Unit Grading Structure:

The learner is required to successfully achieve a pass in each unit for this qualification to be awarded.

4. Unit specification:

LCL-G3001: Understanding Health and Safety in Gas Utilisation Assessment Method {SR}

Learning Outcome 01: The learner will know the Health and Safety legislation

The learner can:

- 1.1 Explain the aims of Health and Safety Legislation in protecting the workforce and members of the public.
- 1.2 Explain the key features of the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR).
- 1.3 Describe examples of where RIDDOR would be used in the gas industry.
- 1.4 State the key responsibilities of employees, employers and customers (clients) under Health and Safety Legislation.
- 1.5 State the role of the following enforcing authorities under Health and Safety Legislation: Health and Safety Executive (HSE).
- 1.6 State the roles, responsibilities and powers of HSE inspectors under Health and Safety Legislation for issue of improvement and Prohibition notices Powers of prosecution.
- 1.7 Describe the HSE role in providing advice and guidance.

Learning Outcome 02: The learner will know the health and safety measures for gas utilisation

The learner can:

- 1.1 State the general hazards and dangers found on a typical work site and the organisations recording procedures
- 1.2 Explain the purpose and importance of completing a risk assessment
- 1.3 Describe the following categories which are completed as part of a risk assessment:
 - Hazards
 - Risks
 - Likelihood
 - Severity
- 1.4 Describe the following risk control measures:
 - Eliminate
 - Reduce
 - Isolate
 - Control
 - PPE
 - Personal Discipline
- 1.5 State the types and purpose of personal protective equipment and clothing to include:
 - Eye Protection
 - Hand protection

- Head protection
 - Foot protection
 - Clothing protection/Visibility
 - Hearing Protection
 - Respiratory Protection.
- 1.6 Explain how and when the above PPE must be used, cleaned and stored.
- 1.7 Describe the types and purpose of signs and safety notices to include:
- Mandatory Signs
 - Prohibition Signs
 - Hazard Signs
 - Fire Fighting Signs
 - Safe Condition Signs
 - Combination Signs.
- 1.8 State the purpose of and contents of:
- “Method Statements”
 - “Permit to Work Systems”.
- 1.9 Describe a model risk assessment to include all the key elements.

Learning Outcome 03: The learner will know the regulations covering the use and disposal of hazardous substances

The learner can:

- 3.1 State the key purpose of the control of substances hazardous to health regulations (COSHH).
- 3.2 Describe hazardous substances and provide examples from each classification category to include:
- Toxic
 - Harmful
 - Corrosive
 - Irritant
 - Oxidising
 - Extremely Flammable.
- 3.3 Explain the general precautions necessary for working with commonly encountered substances to include:
- Fluxes
 - Solder
 - Lead
 - Jointing Compounds
 - Sealants
 - Gaskets.
- 3.4 State the key purpose of the Control of Asbestos at Work Regulations.
- 3.5 Describe the different types of asbestos found in the workplace.
- 3.6 Explain the key risks associated with working with the following:
- White Asbestos (Chrysotile)
 - Brown or Grey asbestos (Amorite)
 - Blue Asbestos (Crocidolite)
 - Asbestos cement materials
- 3.7 Explain the methods and actions required to protect workers and members of the public from the risk of asbestos.
- 3.8 Describe how to remove and dispose of asbestos safely.

3.9 State the licensing requirements for asbestos removal organisations.

Learning Outcome 04: The learner will know manual handling methodology and lifting techniques

The learner can:

- 4.1 Explain the process of planning a lift:
- How to assess a load
 - Moving the load, route safety
 - Duration of lift accessibility
 - Informing others
- 4.2 Describe the safe manual handling of heavy and bulky loads.
- 4.3 Explain the risks of personal injury associated with lifting and handling.
- 4.4 Explain kinetic lifting techniques.
- 4.5 Describe the safe lifting technique used:
- To move loads alone
 - for a 2-person lift
 - Using mechanical aids.
- 4.6 Describe a plan for a simulated lifting activity which includes all key factors.

Learning Outcome 05: The learner will know how to identify and respond to accidents which occur at work

The learner can:

- 5.1 State the main responsibilities of the employer and employee under the 'Health and Safety at Work Act 1974'.
- 5.2 State the requirements for personal first aid provision.
- 5.3 Describe the typical accident and incident recording and reporting procedures whilst working in:
- Domestic dwellings
 - Business premises.
- 5.4 Describe the benefits of reporting accidents and near misses.
- 5.5 Explain how to raise the alarm following an accident and how to contact the Police, Fire Service, Ambulance and Gas Emergency Service.
- 5.6 Classify minor and major workplace injuries.
- 5.7 State the responsibilities and procedures for dealing with minor and major workplace injuries.
- 5.8 Describe how to deal with victims of electric shock including their removal from an electrical supply.
- 5.9 Describe the correct method of administering CPR and identify when it would be performed.
- 5.10 Explain the correct method of placing an accident victim in the recovery position and identify when this action would be performed.
- 5.11 Describe the key elements which are included in a typical organisation's evacuation procedure.
- 5.12 Describe the procedures for reporting accidents and serious occurrences.
- 5.13 Describe the first aid procedure(s) required to treat liquid gas burns.

Learning Outcome 06: The learner will know the requirements for maintaining electrical safety, earthing protection systems and associated dangers.

The learner can:

- 6.1 Describe the electrical dangers of construction sites, business properties private dwellings to include the following:
- Signs of damage or worn electrical cables on power tools and property hard wiring systems
 - Signs of visual fault on electrical components
 - Trailing cables
 - Proximity of cables to service pipe work
 - Buried and hidden cables
 - Avoidance of cables under wooden floors
 - Inadequate over current protection devices.
- 6.2 Describe the safe use of electrical tools and equipment including:
- Power powered supplies
 - 100V supplies
 - 240V supplies.
- 6.3 Explain the purpose and key elements included in the visual inspection of power tools.
- 6.4 State the Portable Appliance Testing (PAT) requirements of electrical equipment and state the procedures applied when electrical equipment fails safety tests.
- 6.5 Describe the potential risks of electric shock resulting from:
- The existing electrical installation
 - Faulty electrical tools and equipment.
- 6.6 Describe the different types of earthing systems used in properties including typical cable sizes.
- 6.7 State the key purpose and differences between:
- Main equipotential bonding
 - Supplementary protective bonding
 - Temporary protective bonding
- 6.8 Explain the use of electrical earth bonding labels.
- 6.9 Explain the electrical industry safe isolation procedure, to safely isolate an item of fixed mechanical or electrical equipment.

Learning Outcome 07: The learner will know fire safety.

The learner can:

- 5.1 State the three elements of the combustion triangle.
- 5.2 State when to when not to tackle a fire.
- 5.3 Describe which fire extinguisher would be required to tackle:
- An electrical fire.
 - A general fire.
 - A gas fire.
 - A small paper fire.
- 5.4 Explain when it would be appropriate to use a fire blanket to extinguish a fire.
- 5.5 State the precautions which should be taken when using blow torches:
- Near to flammable materials
 - In or under wooden floors
 - In roof spaces and other hazardous areas
 - In proximity to electrics
- 5.6 Describe the safe storage, transportation, assembly, testing and use of blow torches.

Learning Outcome 08: The learner will know the safety requirements for working at heights.

The learner can:

- 5.1 Explain the circumstances where it is necessary to work at heights.
- 5.2 State the safety measures and checks needed when working with steps and ladders.
- 5.3 Describe the types of equipment used when working at heights:
 - Step Ladders
 - Ladders
 - Roof ladders and crawling boards
 - Mobile tower scaffolds.
- 5.4 Describe how to assemble, erect and use:
 - Step Ladders
 - Ladders
 - Roof ladders and crawling boards
 - Mobile tower scaffolds.
- 5.5 Explain the working at height safety hierarchy and the selection of equipment.

Learning Outcome 09: The learner will know how to work safety in confined spaces

The learner can:

- 9.1 State the definition of a confined space and the requirements of the confined spaces legislation.
- 9.2 Describe the typical confined spaces which gas engineers encounter at work:
 - Roof spaces
 - Under wooden floors
 - Cellars
 - Plant rooms
 - Duct rooms
 - Metering or governor houses
 - Trenches.
- 9.3 Describe the additional dangers when working in confined spaces.
- 9.4 Describe the additional safety measures which need to be taken when working in confined spaces.
- 9.5 Explain situations where working in confined spaces is required.

LCL-G3002: Understanding Scientific Principles in Gas Utilisation

Learning Outcome 01: The learner will know the Système Internationale (SI) units and uses within gas utilisation.

The learner can:

- 1.1 Describe the Système Internationale (SI) units used in gas utilisation to include:
 - Metre, kilogram, Second and Kelvin.
- 1.2 Describe SI derived units for:
 - Area
 - Volume
 - Velocity
 - Flow rate
 - Acceleration
 - Density

- Force
- Pressure
- Specific heat capacity
- Temperature
- Heat
- Power

1.3 Describe how to convert from imperial to Standard International units using formulas and tables.

1.4 Explain:

- Mass and weight
- Speed and velocity
- Acceleration
- Force
- Work and power
- Temperature
- Specific heat and specific heat capacity
- Sensible heat and latent heat
- Condensation and evaporation
- Comfort conditions – Heat energy rates-thermal efficiency
- Mechanics – mechanical advantage- action and reaction
- Equilibrium
- Moment of force
- Levers
- Stress and strain
- Stresses in beams
- Pulleys – centre of gravity

Learning Outcome 02: The learner will know the sources of energy and heat transfer

The learner can:

2.1 Define renewable and non-renewable energy.

2.2 State the different types of non-renewable energy to include:

- Gas and LPG
- Oil
- Solid fuel
- Electricity generate by fossil fuels

2.3 Describe the different types of renewable energy to include:

- Electricity generated by wind, hydro and wave power
- Solar
- Biomass
- Hydrogen fuel cells
- Air source Ground source

2.4 Describe the transfer of heat and provide examples of the transfer of heat via:

- Radiation
- Conduction
- Convection

Learning Outcome 03: The learner will know the combined gas laws.

The learner can:

- 3.1 State the formula for Charles and Boyles law
- 3.2 Explain the interrelationship between pressure, volume and temperature.

Learning Outcome 04: The learner will know energy efficiency legislation.

The learner can:

- 4.1 Describe the effects of using renewable and non-renewable energy sources on:
- 4.2 Outline the benefits of energy efficient products, services and equipment.
- 4.3 State the key factors of the building regulations (Part L1) which apply to energy efficiency.

LCL-G3003: Understanding Combustion and Properties of Gas

Learning Outcome 01: The learner will know the natural gas supply network and LPG supplies.

The learner can:

- 1.1 Describe the key features of a natural gas network to include:
 - Gas terminals
 - Pipe materials and sizes
 - Compressors
 - Pressure regulation
 - Storage
 - Gas quality.
- 1.2 State the operating pressure ranges for:
 - Low pressure
 - Medium pressure
 - Intermediate pressure
 - High pressure.
- 1.3 Describe LPG bulk and cylinder supply systems.

Learning Outcome 02: The learner will know the operation of pressure regulators.

The learner can:

- 2.1 Explain the need for, purpose and application of pressure regulators.
- 2.2 State the different types of pressure regulators.
- 2.3 Describe the construction and operation of a compensated constant pressure regulator.

Learning Outcome 03: The learner will know the factors affecting pressure loss and the equipment used to measure gas pressure.

The learner can:

- 3.1 State the factors affecting pressure loss

- 3.2 Describe the operation and uses of a typical manometer, clarify the required reading accuracy.
- 3.3 Describe the operation and uses of a typical digital pressure gauge, clarify the required accuracy of reading and calibration checks.

Learning Outcome 04: The learner will understand the combustion of gases, and potential risks.

The learner can:

- 4.1 Describe the characteristics of complete and incomplete combustion including air and fuel requirements.
- 4.2 Explain pre and post aerated flames.
- 4.3 State the symptoms/effects when humans are exposed to Carbon Monoxide.
- 4.4 State other sources of carbon monoxide and carbon dioxide found in dwellings
- 4.5 Describe typical ambient levels of carbon dioxide and identify critical levels and the potential effects on the gas combustion process.
- 4.6 Describe the types of Gas and Carbon Monoxide detectors, state where they should be placed/installed and identify the associated maintenance requirements.
- 4.7 Describe and define the warning signs associated with incomplete combustion.

Learning Outcome 05: The learner will know gas burner operation, design, features and types.

The learner can:

- 5.1 Describe the operation of the following burners:
- Natural draught
 - Pre and post aerated
 - Pre-mix
 - Forced draught
 - Radiant
 - Flameless combustion
- 5.2 State the differences between the performance of pre and post aerated burners.
- 5.3 Describe which burner faults result in:
- Incomplete combustion
 - Flame lift
 - Lighting back.
- 5.4 Describe the key parts and operation of a pre-aerated natural draught burner to include:
- Gas injector
 - Primary airports
 - Venturi
 - Burner head
 - Burner retention.

Learning Outcome 06: The learner will know the properties and Characteristics of NG and LPG.

The learner can:

- 6.1 Describe first, second and third family gases and state their chemical symbols.
- 6.2 Explain the following characteristics of NG and LPG:
- Relative density

- Calorific value
- Gross and net calorific value
- Wobbe numbers
- Flammability limits
- Flame speed
- Ignition temperature
- Viscosity.

6.3 Describe the additional characteristics and properties of LPG:

- Storage of LPG
- Boiling points of LPG
- Types of gases
- Vapour pressure curves
- Vaporisation and offtakes
- Viscosity
- Auto-refrigeration and excessive offtakes
- Origins of LPG.

LCL-G3004: Understanding Building Services and Structures

Learning Outcome 01: The learner will know the types and characteristics of construction materials.

The learner can:

1.1 Describe the types of metals:

- Pure metals
- Ferrous metals
- Nonferrous metals
- Alloys.

1.2 State the properties of metals:

- Strength
- Hardness
- Ductility
- Malleability
- Conductivity.

1.3 Explain heat treatments and their effects on metals.

1.4 Describe the effects of corrosion on metals.

1.5 State the precautions taken to stop the effects of corrosion on metals.

1.6 Describe the types and properties of construction materials used in the workplace:

- Types of Concrete
- Types of bricks
- Types of construction blocks
- Cement
- Plaster products
- Plastic products
- Timber
- Roofing tiles and materials.

1.7 Describe the typical use of the construction materials in 1.6.

Learning Outcome 02: The learner will know the construction methods of buildings and how to read and interpret plans.

The learner can:

- 2.1 Describe the following building components.
- 2.2 State the positions and requirements for service entries into buildings.
- 2.3 Describe the construction methods and materials used in small commercial buildings
- 2.4 Describe the construction methods and materials used in Park Homes.

Learning Outcome 03: The learner will know how to use hand and power tools within gas utilisation.

The learner can:

- 3.1 Describe the range of basic tools and their uses:
 - Screwdrivers –
 - Hammers –
 - Chisels –
 - Masonry and wood –
 - Grips –
 - Wrenches –
 - Spanners –
 - Fixed and adjustable –
 - Spirit levels –
 - Pipe cutters –
 - Hand saws –
 - Hacksaws –
 - Springs –
 - Bending machines.
- 3.2 Describe the range of battery operated tools and their uses:
 - Drills –
 - screwdrivers.
- 3.3 Describe the range of power tools (110V and 240V) and their uses:
 - Drills –
 - small and large –
 - Circular saws –
 - Jig saws –
 - Screwdrivers –
 - Portable threading machine.
- 3.4 Describe the safety checking processes of gas utilisation tools carried out prior to their use:
 - Visual inspections
 - PAT testing/electrical checks
 - Use of RCD adaptors.
- 3.5 State how to safely use the range of gas utilisation tools:
 - Correct application
 - Clarify appropriate PPE to be used.
- 3.6 Describe the tools required and the methods of cutting:
 - metal,
 - steel,

- wood,
- copper,
- alloys,
- plastics.

3.7 Describe the typical Fasteners and Fixings used in the gas industry.

3.8 Explain the methods and types of drills required when drilling through:

- Metal –
- steel –
- wood –
- copper –
- alloys, plastics –
- brick –
- concrete –
- thermalite block,
- studded,
- dry lined, &
- timber frame.

Learning Outcome 04: The learner will know the installation requirements methods and materials for gas pipework (NG&LPG).

The learner can:

4.1 Describe the types of pipe materials and fittings suitable for carrying natural gas and/or LPG to include:

- Copper
- Steel
- Corrugated Stainless Steel
- MDPE
- Movable appliance hoses
- Hoses.

4.2 Describe the types of joints, jointing materials, and jointing methods:

- Copper capillary
- Compression
- Push-fit joints - Press-fit joints
- Threaded and Union joints
- Fusion techniques/joints
- Joint sealing materials.

4.3 Describe the techniques and methods required to bend copper pipe accurately using:

- Bending machines
- Bending springs.

4.4 Describe the general types of pipe supports & fixings for use in brick, concrete, thermal blocks, studded, dry lined, & timber frame applications.

4.5 State the general requirements for pipework installation:

- Location of pipes
- Route
- Appearance
- Positioning requirements for gas controls/isolation valves
- Clipping/securing

- Methods of accommodating movement of pipework in buildings
- Marking of pipes
- Protection of buildings, ventilation
- Pipework in protected shafts, fire escape routes
- Fire stopping in buildings
- Pipework - passing through cavity walls, in walls, in dry lined walls, in voids, in ducts/shafts, in roof spaces, under wooden floors, under solid floors, under the base of walls/foundations
- Exterior pipework
- Below ground pipework
- Restrictions in the use of union/compression fittings
- Proximity to other services
- Electrical Earth Bonding
- Corrosion protection
- Gas pipe identification
- Entry to dwellings from medium pressure meter installations
- Main equipotential bonding.

4.6 Describe the correct methods of lifting and replacing floorboards and chipboard flooring.

4.7 Explain the procedures for the disconnection of pipes and fittings including the use of temporary continuity bonds.

4.8 Explain the precautions to be taken when using exposed flames for soldering joints on existing gas installations/meters.

4.9 Describe the process of correctly sizing the gas pipe work in an installation to include:

- Copper
- Steel
- NG and LPG.

Learning Outcome 05: The learner will know the ventilation requirements, types and methods.

The learner can:

5.1 Describe the general requirements and reasons for ventilation in regard to gas appliances and installations.

5.2 Define the following:

5.3 Explain the terms gross & net CV and clarify the effect on ventilation calculations.

5.4 State the normative documents related to gas appliance ventilation.

5.5 Explain the methods of calculating the ventilation requirements for:

5.6 Describe the approved types of ventilation openings & grilles. Define the criteria they must meet.

5.7 Explain the following:

5.8 State the process of accurately measuring ventilator free areas.

5.9 Describe the requirements for the provision of ventilation labels/notices.

5.10 Describe the potential adverse effects on ventilation from:

- Extract fans
- Cooker hoods
- Tumble dryers
- Solid fuel appliances
- Double Glazing
- Cavity wall insulation
- General draft proofing.

Learning Outcome 06: The learner will know the different types and operation of suitable chimney systems for gas appliances.

The learner can:

3.1 State the Classification of Gas appliances according to chimney types.

3.2 Describe the construction and materials of chimney types to include:

- Brick / Masonry/Chimney Blocks
- Single & Double Wall
- Metallic & Non Metallic
- Flexible Metallic Liners
- Shared (Common) Chimney Systems
- Fan draught
- Vertex chimneys
- Se & U Ducts
- Gas Flue Boxes.

3.3 Explain the design, component parts and general operation of Open Flue Chimney systems to include:

- Parts of an Open-Flue Chimney System
- Open-Flue Chimney System Operation
- Chimney System Design
- Flue dampers
- Shared open flued chimneys
- Cross sectional areas
- Temperature Effects
- Condensation Problems
- Flue Terminal Design
- Bird guards.

3.4 State the requirements for open-flue, natural draught chimney outlet locations and positions to include:

- Open-Flue Chimney Outlet Locations/Terminal Positions - Before 2001
- Open-Flue Chimney Outlet Locations/Terminal Positions - After 2001.

3.5 Explain the design considerations, component parts and general operation of room sealed flue chimney systems to include:

- Metallic and plastics
- Parts of a Room-Sealed Appliance Flue (Natural Draught & Fan Draught)
- Room-Sealed Appliance Flue Operation (Natural Draught & Fan Draught)
- Flue Terminal Design
- Condensing Flues.

3.6 State the requirements for room sealed chimney outlet locations and positions:

- Terminal Positions
- Proximity to doors and windows
- Carports or Extensions
- Neighbouring Properties
- Condensing Appliances
- Basements, Light wells & Retaining Walls
- Terminal Guards – Requirements.

3.7 Describe the requirements for open chimney balanced compartment installations :

- Compartment construction
- Ducted air positions and sizes.

Learning Outcome 07: The learner will know the methods for checking and testing chimney performance.

The learner can:

3.1 Describe the methods and checks required to establish satisfactory construction, effective and safe flue performance to include:

- Open-flue, natural draught chimneys:
 - Visual Checks throughout its length
 - Factors that Affect Performance - Down Draught - Wind Effects
 - *Effects of Passive Stack Ventilation
 - Effects of Fans
 - Flue Flow Test & Spillage Test
 - Testing Fanned Draught Open-Flue systems.

3.2 Room sealed appliance chimneys:

- Visual checks on flue and appliance
- Checking Case Seals and Case Integrity on natural draught, negative and positive pressure appliances
- Checking combustion fan operation.

LCL-G3005: Understanding Gas Safety

Learning Outcome 01: The learner will know industry specific legislation and standards.

The learner can:

3.1 State the key points of gas industry legislation:

- Application of Gas Safety (Installation & Use) Regulations to work activities
- Application of relevant Building Regulations & Standards
- Precautionary actions required to prevent use of unsafe Installations
- UKLPG COPs
- Pressure Systems Safety Regulations.

Learning Outcome 02: The learner will know gas safety legislation.

The learner can:

2.1 Describe the Gas Safety (Installation & Use) Regulations :

- Regulation 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 14, 15,16, 17, 18, 19, 20, 22, 23, 25,26, 27, 30, 32, 33, 34, 35, 36, 37.

2.2 State the fey features of :

- The Gas Act
- Gas Safety (Management) Regulations
- Gas Safety (Rights of Entry) Regulations
- Gas Safety Regulations affecting Northern Ireland and Isle of Man.

2.3 Describe how and when to use the Reporting of Injuries, Diseases & Dangerous Occurrences Regulations (RIDDOR) procedures.

2.4 State the Registration and Competence process that applies to gas engineers.

Learning Outcome 03: The learner will know the gas emergency actions, responsibilities and procedures relevant to the industry.

The learner can:

3.1 State the responsibilities and appropriate actions to be taken in the event of a gas emergency.

- Reporting gas escapes
- Responsibilities of the gas user
- Responsibilities of the gas operative to give gas users advice and safety information
- Responsibilities of the gas engineer
- Turning off at emergency controls
- Elimination of ignition sources
- Reduction of gas concentrations via ventilation
- Action by the gas transporter
- Action by the LPG Supplier

3.2 State the Gas Emergency Priorities to:

- Protect life
- Protect Property
- Secure the escape

Learning Outcome 04: The learner will know the Gas Industry Unsafe Situations Procedure.

The learner can:

4.1 Explain the purpose and scope of the Unsafe Situations Procedure and define the criteria of the following categories:

- Immediately Dangerous (ID) Appliances/Installations
- At Risk (AR) Appliances/Installations

4.2 Describe the national gas emergency provider “Concern for Safety” procedure.

4.3 Explain how the Unsafe Situations procedure is applied.

4.4 Explain the purpose and use of the associated warning notices and labels.

4.5 State the types of RIDDOR reportable work/incidents.

Learning Outcome 05: The learner will know the gas operatives responsibilities in accurately completing emergency notices, warning labels and forms.

The learner can:

3.1 Describe the range of gas utilisation emergency notices, warning labels and forms:

- Warning Notices
- Warning Labels
- RIDDOR Reporting Forms
- Advice Notices
- Gas emergency notices & labels
- Concern for Safety notices & labels.

3.2 Explain gas operative’s responsibilities in completing the emergency notices, warning labels and forms to capture all relevant and required information.

Learning Outcome 06: The learner will know the correct installation locations and types of Emergency Control and Appliance Isolation Valves.

The learner can:

- 6.1 Describe the installation, operation and positioning requirements for Emergency Control Valves (ECV):
- Natural gas/LPG meter installations
 - Remote meter installations
 - Multiple occupancy meter installations
 - Meter Inlet Valves (MIV).
- 6.2 Explain the installation, operation and positioning requirements for appliance isolation valves (AIV).
- 6.3 Describe the associated labels required for ECV's

Learning Outcome 07: The learner will know and understand the requirements for Natural Gas and LPG meter installations up to 0.035 cubic metres.

The learner can:

- 7.1 State the installation methods and requirements for the installation of Natural Gas/LPG meter installations:
- Primary meters
 - Secondary meters
 - Prepayment Meters.
- 7.2 Describe the associated meter labels required for primary and secondary meters.
- 7.3 Describe the operation and accuracy of gas positive displacement meters.

Learning Outcome 08: The learner will know the types of gas meter housings and compartments and the requirements for installation and labelling.

The learner can:

- 8.1 Describe the types of gas meter housings and compartments:
- 8.2 State the suitable locations and fixing requirements for gas meter housings and compartments.
- 8.3 Explain the differences between low pressure and medium pressure gas meter houses and compartments.
- 8.4 State gas operative's responsibilities and the associated labels for meter housings and compartments.

Learning Outcome 09: The learner will know the types of gas meter housings and compartments and the requirements for installation and labelling.

The learner can:

- 9.1 State the key requirements of IGE/UP/1B in regards to both tightness testing and purging.
- 9.2 Outline the types of pressure gauges suitable for carrying out tightness tests and identify the requirements for accuracy of reading.
- 9.3 Describe the process of carrying out gas tightness tests:
- Calculating system volumes
 - Visual checks of gas installations
 - Isolation of appliances

- Testing pressures
- Avoidance of Governor Lock Up
- Let by
- Temperature Stabilisation.
- Test periods
- Use of leak detector to check test point and inlet connection from ECV.
- Allowed pressure drops for existing installations

9.4 Describe the actions to be taken in the event of an ECV letting by.

9.5 Describe the potential effects of electronic token meter tamper devices on tightness testing.

9.6 Explain the situations when a test for gas tightness is required.

9.7 State how to identify low and medium pressure gas installations.

9.8 Describe the methods of correctly purging a U6/G4 small domestic gas installation.

9.9 Describe the general requirements of tightness testing following a reported gas escape.

9.10 Explain the process of tracing and repairing gas escapes on installations and the use of gas leak detectors.

9.11 Describe the requirements to issue gas testing & purging certificates.

Learning Outcome 10: The learner will know to check and set gas installation operating pressures at gas meters and LPG regulators.

The learner can:

10.1 Describe the process of checking and setting gas installation operating pressures:

- Meter regulators - low and medium pressure
- LPG regulators
- Maintaining correct installation operating pressures.

10.2 State the procedure for contacting those authorised to re-set or exchange defective meter regulators.

Learning Outcome 11: The learner will know to safely assess the potential risks, tightness test and re-light temporarily isolated appliances.

The learner can:

10.1 Describe the process and safety factors associated with relighting temporarily isolated appliances:

- Confirmation that the installation is gas tight
- System and appliances are purged of air
- Appliance(s) are re-lit
- Satisfactory operation of user controls is confirmed
- Visual risk assessments are carried out for unsafe situations

10.2 Explain the correct actions required when un-commissioned appliances and systems are identified.

Learning Outcome 12: The learner will know to check and set appliance burner pressures and compare measured gas rates with published figures.

The learner can:

10.1 Explain the process of checking appliance inlet and burner pressures:

- Cookers

- Fires
 - Boilers
- 10.2 Describe the procedure of accurately checking appliance gas rates in both metric (m³) and imperial (ft³):
- Cookers
 - Fires
 - Boilers
- 10.3 Explain the process of establishing the potential causes of low/poor gas pressures.

Learning Outcome 13: The learner will know the principles of operation and methods of testing gas appliance safety controls.

The learner can:

- 10.1 Describe the principles of operation, methods of testing and application of gas appliance safety controls:
- Gas Controls:
- Pressure Regulators
 - Low Pressure Cut Off
 - Thermal Cut Off
 - Gas Cocks/Valves
 - Cooker Hotplate Lid Control
 - Electric Solenoid Valve
 - Excess Flow Valves
 - Flame Protection Devices:
 - Vapour Pressure Device
 - Thermoelectric Valve
 - Flame Conduction & Rectification
 - Interrupter Devices
 - Atmosphere Sensing Devices
 - Spillage Detection Devices
 - Multifunction Controls
- 10.2 Describe the principles of operation, methods of testing and application of Thermostats:
- Bi metallic
 - Liquid Expansion
 - Vapour Pressure
 - Electrical
 - Overheat/Limit
 - Thermistors

Learning Outcome 14: The learner will know to safely work in customers premises and liaise with clients regarding the progress of the job.

The learner can:

- 10.1 Explain how to Survey the work site to check for any pre-existing damage to:
- Building wall/floor surfaces –
 - Existing kitchen, sanitary appliances, heating equipment and other building fitments –

- Building décor and carpets – Furniture.
- 10.2 Describe the methods available to ensure work site areas are protected:
- Use of dust sheets - Building wall / floor surfaces –
 - Existing and new sanitary appliances and kitchen furniture –
 - Building décor and carpets - Gardens/lawns.
- 10.3 Describe how to minimise disturbance to the job:
- Liaison with the responsible person for the property and people who will be affected by the work.
- 14.4 State how to ensure that work is done to the specification:
- Use of normative documents, industry standards, British & European Standards and information from manufacturers' instructions –
 - Self-certification requirements –
 - Building Control Notification requirements
- 14.5 Describe how to ensure the availability of materials on-site (site storage):
- Work in private properties –
 - Work on new-build housing –
 - Work on commercial contracts –
 - Avoiding loss of materials on site (theft).
- 14.6 Explain how to maintain a safe worksite:
- Hazard and risk control –
 - Working Safely –
 - Work areas are clean and tidy –
 - keeping tools and equipment in an orderly manner –
 - following industry standards.
- 14.7 Explain how to ensure customer satisfaction to :
- Communication, consideration, work to specification and required quality,
 - work safety,
 - protect and respect customer property,
 - advise on delays/problems,
 - Instruct customers on the appliance and system operation,
 - leave instructions and appliance literature,
 - check out customer satisfaction

Learning Outcome 15: The learner will know where to acquire information and documentation used during their daily work activities.

The learner can:

- 10.1 Describe how to access the types of information and documentation required for work activities:
- Regulations including: Building – Water – Gas - Data protection - Equal opportunities
 - Standards including: British standards - European standards – UKLPG COP's, IGEM standards, Other recognised standard sources e.g. Energy Savings Trust
 - Manufacturer guidance including: Installation instructions - Service & maintenance instructions - User instructions.
- 10.2 Explain how to access the types of “in company” information and documentation:
- Delivery notes –
 - Work programmes –
 - Time sheets –
 - Plans/drawings –
 - Job specifications –

- Invoices/statements –
- Quotations/estimates.

Learning Outcome 16: The learner will know the regulations in force to protect the environment and control waste.

The learner can:

- 16.1 State the requirements of environmental protection regulations:
- The Controlled Waste Regulations
 - Controlled Waste (Registration of Carriers and Seizure of Vehicles) - Packaging - Building Regulations (including energy efficiency requirements for new dwellings) & Water Supply Regulations
 - Methods of disposing of waste including: Licensed waste disposal sites - Specialist waste disposal requirements e.g. asbestos - Carriage of waste by roads – waste carriers license.
- 16.2 Describe the environmental protection measures which can be incorporated into installation methods and practises:
- Minimising the wastage of equipment and materials
 - Accurate cutting, bending and jointing
 - Loss/theft of material on-site
 - Using principles that minimise the usage of energy in installed systems /components
 - Using principles that minimise the usage of water in installed systems /components
 - Materials that can be readily recycled
 - Ensuring that installed systems/components are correctly commissioned
 - Ensuring that customers are informed on key operating requirements.

5 National Occupational Standard:

The Units used in this qualification have a direct relationship with the National Occupational Standards for the areas of work contained within.

6 RQF Descriptor Level {3}.

Knowledge descriptor: *(the holder can)*

- *Has factual, procedural and theoretical knowledge and understanding of a subject or field of work to complete tasks and address problems that while well-defined, may be complex and non-routine.*
- *Can interpret and evaluate relevant information and ideas.*
- *Is aware of the nature of the area of study or work.*
- *Is aware of different perspectives or approaches within the area of study or work.*

7 Prior qualifications, knowledge, skill or understanding which the learner is required to have before taking this qualification. (Pre-requisites)

None

8 Units which a learner must have completed before the qualification will be awarded and any optional routes.

Learners must have completed all 5 units before the qualification will be awarded. See Section 4 above.

Where learners are also completing an IGEM approved Managed Learning Programme (in accordance with IGE/IG/1) and ACS (CCN1 & CENWAT) Recognition of Prior Learning can be applied to some of the learning outcomes detailed in Section 4. Specific detail of the RPL requirements is contained in Technical Bulletin LC GU001.

9 Other requirements which a learner must have satisfied before the learner will be assessed or before the qualification will be awarded.

none

10 The design and delivery of the examination associated with these units are based on the following documents;

- Gas Safety installation & use Regulations
- Relevant British Standards
- Relevant IGEM utilisation procedures
- RIDOR
- Relevant Building Regulations (Approved Documents)
- HASWA

11 The criteria against which learners' level of attainment will be measured.

The Learning Outcomes and Assessment Criteria against which learners' level of attainment will be measured are detailed in Section 4 of this specification.

12 Planned exemptions

none

13 Specimen assessment materials.

none

14 Specified levels of attainment

Learners must pass all the mandatory units for the qualification to be awarded.

15 Other information

Where the qualification(s) is awarded in the various devolved regions of the UK i.e. England, Scotland, Northern Ireland and Wales, the examination questions and learner responses to those questions are set and responded to in the context of the legislation, normative standards and guidance applicable in that region. Assessors will mark examinations in accordance with the generic model answers and rationales provided by LCL Awards taking into account any variations applicable to that region.

SSAs: {4.1 Engineering}/{5.2 Construction}

Review Date 31st December 2022

Assessment and Examination Terminology

AC – *Approved Centre; an examination conducted either at the approved centre or a location approved by the centre, using staff approved by the centre to conduct the examination.*

CBSR – **Closed Book** *Short Response; Short response written questions will be set by the awarding organisation and administered and marked locally at the approved centre by approved markers. Learners will be prohibited from using industry normative or informative documents.*

CE – *Customer Evidence; evidence provided by a customer in the form of a written witness statement confirming a competent performance by the learner. That evidence may also be provided by an employing supervisor or manager of the learner. Witness statements that relate to a technical competence will only be accepted from a person technically competent in that particular activity to provide the statement.*

IK – *Inferred Knowledge; inferred knowledge is assessed as part of a performance assessment by a centre approved assessor. To deem the learner as having sufficient knowledge the learner must satisfactorily pass the performance assessment.*

LE – *Learner Evidence; learner generated evidence is for example documented recordings of readings, calculations or the production of a risk assessment or other procedural document.*

MC – *Multiple Choice; set by the awarding organisation and administered and marked locally or electronically. Learners will be able to answer multi-choice questions using reference to appropriate industry normative or informative sources.*

O/L – *on-line: a secure web-based assessment system (XAMS)*

OP – *Observed Performance; the assessment of a learner's performance by an approved assessor either in the learner's work place or at the approved centre or a location approved by the centre.*

OQ – *Oral Questions; oral questions may be asked by an assessor as part of a performance assessment or knowledge examination to confirm the understanding of the criteria by the learner.*

PA – *Performance Assessment; a performance assessment conducted either in the learner's work place or at the approved centre or a location approved by the centre.*

RWE – *Realistic Work Environment; an area at the approved centre or a location approved by the centre which replicates and has the features of a Work Place. The learner must not be permitted to be familiar with the simulated environment prior to undertaking assessment.*

WP – *Work Place; is the naturally occurring environment in which the learner works, typically that would be in a customer's premise where work is being paid for by the customer.*