ES PIPELINES LTD

Operations

Requirements for the design and installation of Gas in Multi Occupancy Buildings up to and including 75mbar

ESP/DP/2

Document Details			
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5.5	July 2022	Compliance Manager G. Ansell	Complete review in line with revised IGEM/G/5	Document

Objective

To comply with its Safety Case obligations ES Pipelines Ltd (ESP) has a duty to demonstrate that each natural gas distribution network that the Company owns and operates has been designed and constructed in accordance with current industry standards and legislation. In addition, ESP shall only accept Designs from UIPs accredited to D-MOB and shall only adopt MOB infrastructure from and constructed by UIPs accredited under GIRS to the appropriate level.

This document has been developed to provide guidance for UIP organisations to ensure that gas installations into Multi Occupancy Buildings (MOB) designed by a UIP and subsequently 'adopted' post construction meet Legislative, Industry and ESP's, requirements.

In general, this document (or a design document detailing equivalent design requirements detailed within Legislation, Gas Industry Guidance 2 (GIG2) and IGEM/G/5) must also be used by entities designing, building, and commissioning assets that ESPUG will subsequently acquire and operate.

ESPs key principles for gas safety in flats follow the Design Objectives laid down in IGEM/G/5 latest edition, including to:

- ensure gas will be delivered to consumers at a suitable pressure
- minimise the risk of any fire and/or explosion following any gas leak from the infrastructure
- minimise the risk of fuelling or accelerating any building fire
- ensure no additional third party safety risks are created
- ensure that the gas infrastructure can be inspected and maintained during its lifecycle
- ensure the fire integrity of the building is not adversely affected.

To meet these requirements ESP will validate Designs which:

- Ensure gas asset locations are appropriately ventilated
- Minimise stress on equipment
- Avoid corrosion
- Provide adequate and accessible provision for controlled isolation
- Provide adequate and accessible provision for maintenance and inspection
- Comply with all Industry Standards, Guidance and Legislation.

Content

This document is intended to outline ESP and Industry requirements for gas installation design in MOBs up to and including 75mbar.

Advice and Assistance

Advice on the implementation of this procedure can be obtained from the Head of Network Gas.

Any suggestions for the improvement, correction or update of this policy should be addressed to the Head of Network Gas.

Additional Documentation

This document shall be read in conjunction with those documents and standards as detailed in Appendix A.

1. General

1.1 **ESP shall be consulted at the earliest possible stage in design for all MOB installations to be constructed by a CMOB accredited UIP**. In line with responsibilities identified within IGEM/G/5, the Developer on new builds shall consult with either the gas supplier or gas transporter; evidence of this is required.

1.2 To fully comply with the Gas Safety (Installation and use) Regulations (Regulation 13) and the HSE (ACOP) ISN 07176 1635 5, ESP will not accept installations of gas meters into areas designated as bin stores. Furthermore, ESP will not accept any installations in areas where refuse material will be stored or collected.

1.3 ESP do not accept nor adopt any riser or lateral systems constructed from PE.

1.4 ESP do not adopt internal riser or lateral systems (See Section 8)

1.5 ESP do not accept nor adopt any riser or lateral systems within Cross Laminate Timber constructed MOBs

1.6 **All** ECVs on **all** supplies to MOBs must be fitted with an EFV. This may be a separate, collar secured EFV, or a combined ECV/EFV to recognised industry standards.

1.7 This document must be read in conjunction with the IGEM standard IGEM/G/5 and Lloyds Gas Industry Guidance 2 (GIG2) latest editions

2. ESP hierarchy of gas installations in Multi Occupancy Buildings

2.1. The list below in order of preference covers buildings using conventional construction only, up to and including a maximum of 6 storeys. Any buildings over this height or those which require special design consideration, for example Timber Frame construction, will be subject to full prior consultation with ESP.

a) External meter boxes/GRP manifold housing. (NOTE: ESP do not accept Semi Concealed Meter Boxes)
b) External meter room/cupboard.
c) Internal meter room on the ground floor with ventilation and doors opening direct to the outside atmosphere only.
d) Exceptionally external steel risers no greater than 4 storeys.

ESP does not adopt PE risers

The above hierarchy complies in general with IGEM/G/5 generic consideration of hazards and risks from different supply options, namely:

- gas supplies shall not be constructed in poorly ventilated or strongly confined spaces.
- gas infrastructure in basements and cellars should be avoided unless ventilation and confinement is mitigated fully
- consideration shall be given to the location of the supply with respect to the structure withstanding the consequences of an ignition of a gas escape
- apparatus should be sited to avoid accidental damage or interference with the supply wherever possible

- gas supplies should, as far as possible, be sited externally to the building or in well ventilated spaces.

3. Risk Assessments

3.1 Risk Assessments in line with IGEM/G/5 shall be completed and submitted with the Design.

3.2 A further project specific ESP MOB Risk Assessment shall be completed by the DMOB registered UIP (or CMOB registered UIP appointed D-MOB registered designer) and provided to ESP at the design submission stage.

Where the UIP is unable to provide a risk assessment or ESP deem the assessment not to be fit for purpose, ESP will not validate the Design and request further Risk Assessments be made.

4.` Design Submission (refer to MOB Design Pack Submission Checklist)

4.1 Design Submission Minimum Requirements

The Design MUST be submitted from either a CMOB Registered UIP with an agreement and process with a D-MOB Registered Design Company, or from a D-MOB Registered Design Company with an agreement and process for construction with a CMOB Registered UIP.

A copy of the Lloyds GIRS Registration Certificate should be submitted with the first Design submitted under the revised GIG2 conditions, together with their defined competencies for those involved with such designs, preferably demonstrating competence via any proposed IGEM contextualised Register.

Note: These competences may have already been ascertained at the UIP Validation process, however the Design validator should satisfy themselves of this.

The Design Pack must contain the following documents as the minimum acceptable (or marked as “Not Applicable” where required)

(i) FM153/FM153a
(ii) GDN or Upstream Network Owner (UNWO) approval
(iii) Polygon Map and Polygon text string
(iv) SNAP/Gasworks output with noded drawing
(v) Sensitivity analysis for ≤10 premises off manifold/network or large appliance loads
(vi) Fully completed Risk Assessments
(vii) Easements (Where applicable)
(viii) Detailed Building Drawings
(ix) Gas layout Proposal drawing
(x) Elevation drawings
(xi) Isometric gas pipework drawing clearly detailing the material specification and jointing technique/standard (**this also must be included for all manifolds**)

(xii) Isometric gas pipework design layout clearly identifying type ,size and full specification of **valves** and support/restraint (**this also must be included for all manifolds**). **PIV to be a minimum of 5m from building**

(xiii) Isometric gas pipework design layout clearly identifying type and size of isolation for steel network (**this also must be included for all manifolds**) **PIV to be a minimum of 5m from building**

(xiv) Specifications and details of fixing support/restraint to building infrastructure

(xv) Thermal expansion/contraction detail and mitigation

(xvi) Drawing containing all details of ventilation provision, calculation, location, size and minimum free area *

(xvii) Hazardous Area (zones) Drawing(s)

(xviii) Details of access panels to be provided by the developer, and requirement for fire resistance*

(xix) Differential movement mitigation for Timber Frame Constructs

(xx) Through wall/ceiling sealing and fireproofing detail*

(xxi) For meter rooms, meter room specification including sealing requirements and ventilation*

(xxii) Building owner/Responsible Person for Building/management company contact details.

The above Drawings must be provided in a format that complies with BIM2 (Building Information Modelling Level 2) and is compatible with the Developers/Building Owner/Responsible Person drawings/information system(s).

All Design submissions must include a statement relating to the compliance of the proposed design with Approved Document B (The Building Regulations 2010 Fire Safety B Volume 1: Dwellings, incorporating 2020 amendments, for use in England).

*the responsibility for these components lies with the Developer, however fully detailed drawings must be provided in order the UIP and ESP can satisfy the detailed proposals have been met by the Developer.

4.2 Design On-Site Validation

4.2.1 Following the Desktop appraisal of the Design submission, and prior to the construction stage ESP will attend site together with the Designer and Developer/Responsible Person for the Building to complete a joint inspection and further risk assessment. This is to ascertain the proposed Gas Design can be accommodated within the proposed building, and all engineering requirements can be met and are understood, including Building Information Modelling Level 2 requirements. ESP shall also confirm full understanding of all areas of responsibility at this meeting, including the provision of any further details and/or drawings to assist in Design appraisal and validation.

4.3 Design Pressure

4.3.1 It is ESPs preference that the minimum mains network pressure is 22mbar.

4.3.2 For all steel pipework installations there must be 22mbar at the extremities of the network.

4.3.3 Design minimum pressure at the ECV is 20.75mbar**

**Note: Designs must include for an EFV located downstream of (and preferably integral with) the ECV and may also include a TCO. Where these devices are attached directly to the outlet of, or combined with, the ECV, the Design must ensure the design minimum pressure of 20.75mbar is achieved at the outlet of the device, as this forms part of the ESP network.

4.4 Manifolds

4.4.1 ESPs preference is the use of a meter manifold. These must be constructed in full compliance with the Design, the Design to include material, supports, support fastening and welding specifications. Any manifold so constructed must:

- Be constructed and fabricated from materials/components that are compliant for use with LP natural gas and meet the required IGEM/G/5 specifications, and any gas Design detailed specifications for materials and welding/weld inspections.
- Be tested to 350mbar as a separate construct, i.e., whilst not connected to any network pipeline. This does not preclude a final test once all network is connected. (This separate test certificate must be presented to ESP as part of the pre-commissioning inspection and form part of the completion pack).
- Ensure the anti-tamper valves and other isolation devices (EFV/TCO/Isolation joint) for isolation/maintenance comply fully with the gas Design submitted, and are labelled to suit.
- Have support and restraint, and fixings to the building infrastructure detailed, and must be as per the submitted Design.
- Have corrosion prevention measures as detailed in the Design.

5. Timber Framed Structures

5.1 ESP shall be consulted at the earliest opportunity to discuss any Timber Framed structures no matter how many stories.

5.2 For all details relating to Timber Frame Structures the requirements of IGEM/G/5 shall be followed, i.e., provision shall be made to manage the differential movement and to accommodate any resultant stresses should the provision not be effective or cease to function.

5.3 Where a building is of Cross Laminate Timber (CLT) construction full consultation with ESP must commence prior to any Design documentation being submitted to ESP for validation. **Only external meter banks, separate to the main building, may be considered**, however the provision of gas infrastructure to cross laminate timber developments is not an ESP preference.

6. Valves

6.1 All Pipeline Isolation Valves (PIV) must be installed in a suitable chamber and be a minimum of 5m from the building line. The valve chamber cover must clearly identify that the valve is related to gas and be yellow. There shall be a minimum 100mm wide concrete surround to the cover to prevent valve cover burial or damage. An identification marker post/plate shall also be specified at the closest available point to the entry/valve.

6.2 Upon entry into a building a tamper proof Inlet Isolation Valve (IIV) must be specified at an accessible location and height. An above ground entry fitting (with integral stopper) is acceptable as an IIV, and must be labelled accordingly. An identification plate shall also be specified at the closest available point to the IIV.

6.3 When designing a manifold arrangement, and if required, consideration should be given to the installation of a Branch Isolation Valve(s) (BIV). Anti-tamper BIVs should be specified to enable each branch of a manifold to be isolated for maintenance/emergency purposes whilst minimising disruption to the entire building population.

6.4 All internal manifold arrangements must include at least one thermal cut off valve (TCO).

7. Meter Enclosures

7.1 Refer to BS6400-1 and IGEM/G/5 for guidance on meter enclosure requirements, for multiple meter installations and when located within individual premises adjacent to the only means of escape. Note that multiple meter/meter bank rooms come under the DSEAR and these requirements have to be complied with.
NOTE: ESP do not accept Semi Concealed Meter Boxes

8. Internal Riser/Lateral systems

8.1 ESP will **NOT** adopt internal riser/lateral systems in MOBs.

9. Construction of Gas Infrastructure in MOBs.

All gas infrastructure in MOBs will only be adopted from, and therefore MUST be constructed by, a UIP with the appropriate GIRS Accreditation and registration with Lloyds Register, e.g., be registered for the Scope Construction of Multi Occupancy Buildings (CMOB).

The only exception to this is where the MOB is supplied entirely and exclusively by individual meter boxes around and external to the MOB. There will be no exceptions to this requirement.

NOTE: ESP do not accept Semi Concealed Meter Boxes

The UIP should provide evidence of competence of all concerned in the management of and construction of gas in MOB, including Operatives, Supervisors and Technical Advisors.

9.1 The UIP carrying out the construction must have , and must adhere to, documented processes for the following activities:

a) Defined competencies for those involved in the construction and management of such installations
b) Clear guidance on material specifications to be used
c) A documented process for interfacing with a provider holding GIRS D-MOB accreditation.
d) A documented process for interfacing with the Building Responsible Person.
e) An understanding of BIM Level 3 requirements for records.
f) A robust inspection regime for pre-construction, construction, and commissioning.
g) A documented process for ensuring firestopping and ventilation requirements are met and in place prior to any commissioning.
f) Construction of screwed, welded, and other mechanical joints method statement
i) The securing of the infrastructure to the fabric of the building method statement including clear guidance on support and restraint
j) Construction arrangements for Timber Framed construction
k) Construction arrangements for dealing with thermal expansion/contraction
l) A process to ensure copies of construction records are made available to the Principal Designer for the development or the Responsible Person for the Building.

9.2 There shall be a clear, documented procedure for audit and inspection, particularly:

- At pre-construction stage with the Developer/Responsible Person for the Building, Designer, and adopting GT
- At pre-commissioning and pressure testing stage with the Developer/ Responsible Person for the Building and Adopting GT (SCO applies to both pressure tests and commissioning for MOBs)
- At the completion stage with the Developer /Responsible Person for the Building and Adopting GT.
- Submission of Permitry for clearance to proceed prior to testing and commissioning the pipework installation.

10. Completion Pack Documentation Submission Requirements (refer to Completion Pack Checklist)

10.1 Whilst not forming part of the Design process, the Designer should be aware of ESPs expectations for Completion Documentation from the UIP, and this section details the requirements of the Completion Pack.

The completion pack should contain, but not be limited to, the following (see also Schedule 9 of the Asset Adoption Agreement):

(i) All Completion pack submissions must be provided in accordance with ESPs Asset Adoption Agreement and any other reasonable requirements specific to multi occupancy buildings (MOBs).
(ii) Soundness Test Certificates for the entire mains infrastructure associated with the works.
(iii) Valve record cards.
(iv) 'As-laid' plans for the entire mains infrastructure associated with the works.
(v) Isometric 'As-Laid' plans for each riser/lateral system and manifold system.
(vi) Mains record card
(vii) Service job card for each service.
(viii) Meter installation record card.
(ix) Soundness Test Certificate for each service (unless the whole network has been tested as one construct, e.g., manifolds).
(x) Informative photographs (Showing meter labelling and any additional signage), positions of PIV, TCO, EFV, BIV, PIV, and IIV to enable their location to be easily verified on site and also mark/reference their positions on the final 'As-laid' drawings.
(xi) Details of building access procedures, and details of access panels for inspection and maintenance requirements.
(xii) Memorandum of Understanding between the GT (ESP) and the Developer. The UIP shall be an integral part in obtaining this documented agreement.
(xiii) Whilst the responsibility of the Developer/Building Responsible Person, evidence must be supplied to confirm that the actual ventilation matches that stated on the design and risk assessment, and meets the required minimum levels identified within the design and Industry documents. The free air ventilation requirements must be adhered to. Please note that slats used in louvre doors and vents, airbricks or grill must not reduce the amount of free air ventilation from that calculated in the risk assessment.
(xiv) Where appropriate non-Destructive test records (magnetic particle and/or X-ray), wrapping inspection reports, welding inspection reports, and all other relevant records or information relating to the competence of the welder and welding specification/works, including for any welded manifolds installed.
(xv) Details of all equipment and fittings detailed on the Design, including thermal expansion/contraction mitigation, differential movement mitigation, isolation joints, supports and restraints, and their fixings, corrosion protection details, and firestopping (this latter is the responsibility of the Developer/Building Responsible Person, but should be recorded and documented).
(xvi) Copies of material specifications for non-standard material procured and used e.g., flexible couplings used to relieve thermal movement stress on laterals, all welded fittings, EFV and TCO, etc.

The above Completion Drawings must be provided in a format that complies with BIM2 (Building Information Modelling Level 2) and/or is compatible with the Developers drawings/Responsible Persons information system(s).

Appendix A

All design proposals must be completed in accordance with but not limited to the following:

Legislation:

- Gas Safety (Installation and Use) Regulations 1998
- Gas Safety (Management) Regulations 1996
- Pipeline Safety Regulations 1996
- Construction Design and Management Regulations 2015
- Dangerous Substances and Explosive Atmosphere Regulations 2002
- Approved Document B, The Building Regulations 2010 Volume 1 Dwellings incorporating 2020 amendments.

IGEM Standards:

- IGEM/TD/3 Steel and PE pipelines for gas distribution
- IGEM/TD/4 PE and steel gas services and services pipework
- IGEM/TD/101 Adoption of pipe systems by a GT, management of UIP activities.
- IGEM/GM/7A Electrical Connections for Gas Metering Equipment
- IGEM/GM/7/B Hazardous area classification for gas metering equipment
- IGEM/SR/25 Hazardous area classifications of Natural Gas installations
- IGEM/G/5 Gas in Multi Occupancy Buildings
- IGEM/UP/7 Gas installations in Timber Framed and Light Steel framed Buildings

British Standards:

- BS6400 – 1 Domestic sized gas meters – Low Pressure
- BS8313 Code of practice for the accommodation of building services in ducts

Gas Industry Standards:

- GIS/PL 2-1: Technical specification for polyethylene pipelines and fittings for natural gas and suitable manufactured gas Part 1: General and PE compounds for use in PE pipes and fittings
- GIS/PL 2-4: Technical specification for polyethylene pipelines and fittings for natural gas and suitable manufactured gas. Part 4: Fusion fittings with integral heating element(s)
- GIS/L2: - Technical specification for steel pipe 15mm to 450mm inclusive nominal size for service at pressure up to 7 bar
- GIS/V7 – 1: Technical specification for distribution valves metal bodied for use at pressures up to 16bar and construction valves up to 7bar.

- GIS/V7 – 2: Technical specification for distribution valves plastic bodied valves of sizes up to 63mm suitable for operations at pressures not exceeding 5.5bar

Lloyds Register Documents

Gas Industry Guidance Document - GIG (GIG2)