

MANAGEMENT PROCEDURE FOR INSPECTION, MAINTENANCE AND MONITORING OF METALLIC SUPPLIES TO HIGH RISE BUILDINGS



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Document Summary

Foreword

This policy document was approved by Engineering Policy Manager on 14th September for use by appointed persons throughout National Grid Gas.

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Mandatory and Non-Mandatory requirements

In this document:

Shall: indicates a mandatory requirement

Should: indicates best practice and is the preferred option. If an alternative method is used then a suitable and sufficient risk assessment shall be completed to show that the alternative method delivers the same, or better, level of protection.

Background

To comply with current legislation, National Grid Gas, as a gas transporter, shall satisfy the requirements of Regulation 13 of the Pipeline Safety Regulations 1996, and ensure pipelines are 'maintained in an efficient state, in efficient working order and in good repair'

The application of this procedure shall satisfy the requirements of the Policy for Inspection, Maintenance and Monitoring of Metallic Supplies to High Rise Buildings – T/PL/LC/20.

This Procedure follows on from a series of surveys of high rise flats that were undertaken in the period 2002 to 2011.

Failure to comply with the requirements of this document could result in National Grid Gas and/or individual employees facing criminal charges.

Failure to comply with the requirements of this document could also result in individual disciplinary action.

Scope

This procedure details the measures required for compliance with T/PL/LC/20 - Policy for Inspection, Maintenance and Monitoring of Metallic Supplies to High Rise Buildings, and applies to all high-rise buildings.

This procedure includes a leakage survey, data gathering and visual condition assessment to establish the general condition of high-rise buildings that contain a gas supply.

References

This procedure makes reference to documents listed in **Section 3**. Unless otherwise specified the latest editions of the documents referenced therein shall apply, including all addenda and revisions.

All gas emergency work takes priority over any other network activity

INTRODUCTION

It is the responsibility of the ASSET STRATEGY AND INVESTMENT PROGRAMME MANAGER to identify and survey all high-rise buildings. Should any survey identify any installation that is immediately dangerous, it is the responsibility of the relevant HEAD OF OPERATIONS, to immediately cascade this information to all relevant parties and initiate those relevant actions that are within their remit.

It is the responsibility of the RESPONSIBLE ENGINEER to analyse the information for use in scheduling future survey requirements and replacement prioritisation.

1. Definitions

1.1. General

For the purposes of this procedure, the definitions are given in section 1.4.

1.2. High Rise Building

A High Rise Building is defined as a building having at least six storeys above ground level (i.e. including the ground floor) that contains an up-stream pipe-work system, including internal risers and laterals to multiple meter points.

Basements/cellars shall NOT be regarded as a storey within the context of this policy.

1.3. Personnel

All personnel shall be competent to undertake the roles required of them

RESPONSIBLE ENGINEER: National Grid Engineer with overall responsibility for the inspection and maintenance of risers, including collating data from the individual area, running the ranking model and determining work priorities. This is currently the ENGINEERING POLICY MANAGER.

OPERATIONAL MANAGER: National Grid appointed person with responsibility for the SURVEYORS undertaking the inspections of the buildings. This is likely to be more than one person in a number of geographic areas, e.g. Network SUPERVISOR (Operations).

SURVEYOR: National Grid appointed person assigned to undertake the site surveys of the buildings. This is likely to be more than one person in a number of geographic areas, e.g. First Call Operative.

DATABASE ADMINISTRATOR: National Grid appointed person who undertakes the inputting of survey data into the appropriate system.

DATABASE SUPERVISOR: National Grid appointed person with responsibility for ensuring that survey data is correctly input and validated, the ranking model is correctly run and output provided to the RESPONSIBLE ENGINEER.

1.4. Installation

Main – Defined as an extension of or change to the system with the potential to supply more than two (2) meter points. Thus the buried pipe supplying gas to a multi-occupancy building (with multiple meter points) is termed a main.

Supply pipe – this is the pipe which brings gas from the distribution main directly to the building and connects to a riser, either horizontal or vertical. In some case this will be shown as a main on NGGs maps system. Locally this pipe may be referred to as the 'service pipe' to the building.

Riser – Risers are defined as arrangement of pipes (predominantly vertical but with horizontal sections), which supply more than two (2) meter points in an individual premise or building containing many premises.

A pipe is considered to be a riser (rather than a supply pipe/main) once it enters the building (for internal risers) or emerges from below ground (for external risers)

In this survey there are two types of riser considered:

- **Vertical Riser:** A vertical pipe that carries gas between floors within a building. This is a pipe that supplies gas to more than two (2) meter points.
- **Horizontal Riser:** A horizontal pipe typically connected to a vertical riser that conveys gas along one floor level within a building. This is a pipe that supplies gas to more than two (2) meter points.

Lateral: - An above ground arrangement of pipes that supplies gas from the riser to the outlet of the ECVs for the meter installations on that floor.

Tamper-proof – Protected against unauthorised operation.

Storey – Floor construction level. The ground floor is counted as a storey within the context of this policy.

Basement/cellar – A room below ground level in the building that is being used for accommodation or as a storage area, or could easily be altered for accommodation or storage. (Basements/cellars shall NOT be regarded as a storey within the context of this policy).

2. Responsibilities

Table 1 below provided a quick reference to the responsibilities detailed in this procedure.

Responsibilities		
Description	Typical Job Role	Section
Responsible Engineer	Engineering Policy Manager	Introduction, 4, 5, 6.1, 11.1, 12.1, 12.2, 14
Operational Manager	Network Supervisor	7.4.1, 7.4.2, 7.4.5, 7.4.6, 7.4.8, 10, 10.1, 11, 12.1
Surveyor	First Call Operative	7, 7.3.1, 7.4.1, 7.4.2, 7.4.3, 7.4.4, 7.4.5, 7.4.6, 7.4.9, 7.4.10, 10.1, 11.
Database Administrator	Admin Administrator	7.4.8, 8.2, 10.2, 11.1
Database Supervisor	Team Leader	8.2, 10.2
Asset Strategy and Investment Programme Manager	Asset Strategy and Investment Programme Manager	Introduction
Head of Customer Operation	Head of Customer Operation	7.1, 7.2, 7.4.5, 7.4.8, 8.2, 10.2, 12.1
Engineering and Integrity Manager	Engineering and Integrity Manager	12.1
Network Integrity Engineer	Integrity Engineer	7.4.5
Head of Operations	Head of Operations	Introduction, 7.4.5, 7.4.6, 7.4.8, 8.2, 8.3, 10, 12.1
Engineer	Network Engineer	7.4.8

Tab 1. Responsibility cross reference

3. References

This National Grid Gas Procedure makes reference to documents listed below. Unless otherwise specified, the latest editions of these documents, including all addenda and revisions, shall apply.

- a) Health and Safety Executive - Pipeline Safety Regulations 1996 – Design, construction and installation of gas pipes.
- b) National Grid Gas Policy for Inspection, Maintenance and Monitoring of Metallic Supplies to High Rise Buildings – T/PL/LC/20.
- c) National Grid Gas Procedure – ‘Walking leakage detection surveys using portable instruments of high sensitivity (ppm detectors)’ T/PR/LC/13.
- d) National Grid Gas Procedure – ‘National Grid Gas Operational procedures for dealing with gas escapes and other emergencies’ MGUK/PR/EM/72.
- e) National Grid Gas Procedure – ‘Work Procedures for Locating and Repairing Gas Escapes on the Network Operating at Pressure not exceeding 7bar’ T/PR/EM/74.
- f) National Grid Gas Procedure – ‘Management Procedure For Cathodic Protection of Buried Steel Systems’ MGUK/PR/ECP/2.
- g) National Grid plc – Information and records management procedure.
- h) Institution of Gas Engineers and Managers document – ‘Gas in flats and other multi-dwelling buildings’ IGE/G/5.

4. General requirements

The RESPONSIBLE ENGINEER shall ensure that data is compiled and maintained for all known high-rise buildings containing a gas supply.

The minimum basic information for the building is:

- Location
- Property owner
- Number of floors
- Number of flats
- Number of and location of risers
- Riser sizes and materials

Records shall be kept and in such a format such that, in addition to the above, the prime survey document can be retrieved.

5. Inspection intervals

A full survey
required after
replacement or
repair

The inspection interval for all known high rise buildings shall be determined by the risk ranking from the previous survey. Additionally, following any repair or replacement work on the distribution pipe work within a high rise building, a full T/PM LC/21 survey should be undertaken of the high rise building within 3 months of the work being completed.

The list of buildings to be routinely inspected in the following year will be determined and circulated by the RESPONSIBLE ENGINEER.

The **maximum** interval of inspection defined in the following table shall be applied.

Maximum building inspection interval	
% of total cumulative relative risk	Maximum interval (years)
10%	1
20%	2
50%	3
75%	5
100%	10

Tab 2. Maximum inspection interval

The 'Building Risk Score' is a sum of the individual risk scores for all risers in a building. All risers shall be surveyed during the planned building survey.

In order to ensure that annual workloads are approximately the same the inspection intervals may be brought forward, i.e. earlier than required in the table above. Inspection intervals may not be extended beyond those defined above.

Inspection interval
will be determined
on a risk basis and
a maximum
interval of 10 years

The risk thresholds detailed in the above table shall be reviewed every three years by the RESPONSIBLE ENGINEER. To support this it will be necessary for the RESPONSIBLE ENGINEER to develop a methodology for assessing the relative risk of each installation compared to the total population of high rise buildings.

Where a new high rise building is identified the RESPONSIBLE ENGINEER shall be notified as soon as reasonably practicable. Newly identified high rise buildings shall be surveyed as soon as reasonably practicable but no later than six months from the date of discovery.

A management information monitoring system shall alert the RESPONSIBLE ENGINEER of any high rise buildings that will not meet the maximum interval of inspection defined in Table 2 above.

6. Data collection

6.1. Identification of high rise buildings requiring survey

Data is collected to inform an engineering assessment of the requirement to repair, maintain, replacement and inspection of pipework within high rise buildings.

Data input into the electronic database is only a part of the overall assessment process. This data is used to screen the population of high rise buildings having gas supplies to identify those that need more detailed examination.

The data that is input may be a small fraction of the data that is recorded for an individual building.

ALL fields on the
survey form
SHALL be
completed

In providing data for the database, an input is required for all questions. Leaving an answer blank is not an acceptable option.

The RESPONSBLE ENGINEER shall ensure that systems and processes are in place to ensure that, as far as reasonably practicable, National Grid Gas surveys all high rise buildings for which it has responsibility.

To support this it is the responsibility of the RESPONSIBLE ENGINEER to develop appropriate survey capture techniques.

6.2. Pre-site survey data collection

Not all the data required in assessing the condition of the pipework can be obtained from the site survey, some information will need to be obtained from other sources, including:

- Details of mains connected to the building (e.g. Pipe ID, material, diameter, operating pressure).
- Details of building (e.g. age of construction, geographic location, construction type).
- Details of internal pipe work (e.g. date of construction of internal pipe work, number of recorded repairs).
- Risk scores (from MRPS) for the distribution main risk score may be available and can be obtained from the asset repository record.

7. Site inspection

The information for each building will comprise information derived from:

- Building type/construction
- Leakage survey
- Pipework condition assessment

The SURVEYOR shall use the survey form detailed in Appendix A for data capture. This form may be supplemented by the use of other NGG approved paperwork, e.g. OSGEM paperwork for leakage survey results.

7.1. Initial preparation

Before commencing a site visit;

Advance
notice
required of
survey

- The previous inspection form (or forms) should be examined.
- Work recorded as being undertaken on the network pipe work to the building should be identified (e.g. from the asset repository).
- A map of the gas mains to and around the building should be obtained.
- Contact made with the Facility Manager/Caretaker (if applicable) to ensure access is maximised.

In order to maximise the likelihood of access, residents and/or building owners should be notified in advance of that an inspection of the pipework is to be undertaken. The HEAD OF CUSTOMER OPERATIONS shall ensure that processes are in place to deliver this objective (see Appendix B – Letter 1).

7.2. Building condition

The HEAD OF CUSTOMER OPERATIONS shall ensure that processes are in place to deliver this objective.

Prior to the survey commencing the building owner will be requested, via the return of a proforma (see Appendix B) to notify National Grid Gas if they are aware of anything associated with the building which might increase the risks to:

- the gas pipework , e.g. progressive collapse, and
- the Surveyor, e.g. asbestos.

The date of notification will be retained and the results input into the risk model.

Where the building owner identifies a risk to the surveyor, the surveyor should be made aware before commencing the survey.

7.3. Leakage

7.3.1. External

A formal leakage survey shall be undertaken by a SURVEYOR during the site survey. All reading(s) shall be measured and recorded with an instrument that can measure gas concentrations at a ppm level.

The survey should be undertaken with a ppm instrument

A walking perimeter leakage survey shall be conducted (including surface boxes, visible gas pipework and accessible pipe entries) from the distribution main to the building line and around the perimeter of the building (including any openings to the building itself).

⚠ Refer to **National Grid Procedure – ‘Walking leakage detection surveys using portable instruments of high sensitivity (ppm detectors)’ T/PR/LC13**

If you detect a gas leak follow EM72

Note the following when undertaking the survey

- Where the ground surface between the distribution main and high rise building is ‘sealed’ then a barhole survey should be undertaken using the principles set down in EM/72.

⚠ Refer to **National Grid Procedure – ‘National Grid Gas Operational procedures for dealing with gas escapes and other emergencies’ NGUK/EM/72**

Incoming gas supply requires barhole survey

- Where the line of the incoming supply pipe (s) to the high rise building is known, or can be determined, a bar hole survey shall be undertaken along its route. The length of this survey shall be determined from whichever is shortest of either:
 - 5m from the building line or
 - To the distribution main

7.3.2. Internal

A formal leakage survey shall be undertaken during the site survey. All reading(s) shall be measured and recorded with an instrument that can measure gas concentrations at a ppm level. Where used inside a building the instrument shall be intrinsically safe.

An internal leakage survey of the pipework shall be undertaken.

Gas readings shall be measured and recorded using a ppm instrument

- Gas concentrations shall be measured and recorded at each location where a visual assessment is undertaken (see Section 7.4).
 - ⚠ If a leak is found inside the building, the source of any escape should be identified as far as practicable. Refer to **National Grid Procedure – ‘National Grid Gas Operational procedures for dealing with gas escapes and other emergencies’ NGUK/EM/72**
- In the event of a continuous riser shaft being present for the full height of the riser, a leakage measurement should be undertaken at least at the top of the shaft.
- If there is no such shaft, e.g. shaft sealed at each floor, the riser should be leakage surveyed by gaining access to every space containing pipework, e.g. flat, cupboard. Where access cannot be gained the atmosphere through an opening such as a letterbox or ventilation grill shall be checked and recorded.
- If an internal leakage survey, either in part or full, cannot be undertaken, the reasons shall be recorded on the High Rise Building Assessment Survey Form, e.g. pipework not accessible.
- For below ground entries a leakage measurement should be taken at the base of the riser.
 - The SURVEYOR needs to be aware that on some installations compliant with IGE/G/5 this element of the pipework should be constructed in a ‘sand box’ and gas readings taken and recorded.
- ⚠ Refer to the **Institution of Gas Engineers and Managers document – ‘Gas in flats and other multi-dwelling buildings’ IGE/G/5.**

7.4. Pipework condition assessment

A pipework condition assessment shall be undertaken and the records collated using the High Rise Building Assessment Survey Form. The assessment shall include the following factors:

- Location and number of condition assessments undertaken
- Assessment of the pipework material

- Assessment of the level of metal loss and wrapping
- Determining pipe wall thickness
- Assessment of pipework condition
- Inspection of areas of severe corrosion
- Sleeving of pipework through floors, walls, voids, etc.
- Comparative assessment against IGE/G/5.

7.4.1. Location and number of condition assessment

The survey should include as much as the pipework as reasonably practicable

In the event of the pipes within the building being enclosed or otherwise inaccessible, arrangements should be made with the building owner to gain access to enable the pipe condition to be determined.

In determining the location and number of inspections the SURVEYOR should be aware that the design, e.g. in screed floor, ducted, different material, may vary within the building and should ensure the inspections are representative.

The inspection shall include the riser(s) and associated lateral(s).

RISER

The SURVEYOR should inspect the entire riser system(s). However, where this is not possible the reasons shall be recorded on the survey form.

LATERALS

The minimum visual inspection regime for laterals is shown in the table below. All laterals on the floor subject to inspection should be inspected. However, where this is not possible the reasons shall be recorded on the survey form.

'Additional inspection locations' should, where reasonably practicable to do so, be equally spaced between the top and bottom of the riser.

The **minimum** visual inspection regime to be followed alongside the internal leakage survey is:

Location and number of lateral inspections per riser			
Inspection location (Laterals)	10 storeys or less	11 to 20 storeys	21 or more storeys
Top	Yes	Yes	Yes
Additional inspection locations	No	Yes	Yes
Bottom	Yes	Yes	Yes
Minimum number of inspections per riser	2	3	4

Tab 3. Location and number of lateral inspections per riser

Further intermediate sampling shall be undertaken if the condition is categorised as 'moderate' or 'severe'. See section 7.4.5. This will be determined by the OPERATIONAL MANAGER.

7.4.2. Assessing the pipework material

In considering a riser material, the least protected category observed should be applied.

Least protected category observed should be applied

For example, where the riser is constructed from PE coated lengths of steel pipe, but the connections were bare metal fittings; the overall riser should be treated as if it were bare steel.

Repair/replacement is defined as repairs or replacement of part of the distribution pipework not the renewal of the complete riser. If a riser had been renewed leaving existing pipework in place a more realistic risk ranking may be obtained by considering just the earlier pipework. However, in such a case engineering judgement would be required to assess the best way of evaluating the building. The SURVEYOR should consult the OPERATIONAL MANAGER for further advice and guidance.

Where the pipework material is copper an assessment of its location shall be undertaken to confirm that it is still suitable to be used in such a position without representing a

- Fire hazard on an escape route, or
- Could be subjected to any interference damage which could give rise to a gas escape.

7.4.3. Assessing the level of metal loss and wrapping

A pit gauge should be used to determine pipe wall metal loss

The measurement of metal loss should be made using appropriate equipment, e.g. Pit gauge.

Where measurement is not possible a visual estimate shall be made of the percentage of pipe wall remaining.

The pipe should be cleaned before wall thickness measurements

Unless the SURVEYOR believes the act will result in a gas escape before making the measurement it is necessary to brush off any surface corrosion that could effectively increase the pipe wall thickness.

Assessment of wrapping (or other corrosion protection coating) shall include the entire pipe including joints not just the main barrel of the pipe itself. The condition of the worst section of corrosion protection should be the dominant factor.

7.4.4. Determining wall thickness

If following the visual condition assessment, any section of pipe is found to be in suffering from corrosion, the pipe external diameter (e.g. using a vernier gauge/callipers) and depth of metal loss shall be measured.

Particular attention shall be given to the pipework immediately above sealed inter-floor positions and shoulders of socketed joints where corrosion is most likely to occur.

In general, pipe manufactured to BS 1387:1957 was used in the construction of steel pipework in high rise buildings.

Where the actual grade of material is:

- Known, e.g. medium gauge, the actual wall thickness shall be used in determining the 'condition category'.

Unknown, the SURVEYOR shall assume the material grade is 'light' in determining the 'condition category'.

If the pipework grade is unknown use Light (brown) grade to determine wall thickness

Material grade and wall thickness for steel pipe				
Nominal Bore (in)	Approx. outside dia. (mm)	Wall thickness (mm)		
		Light (Brown)	Medium (Blue)	Heavy (red)
¾	27.0	2.3	2.6	3.3
1	34.1	2.6	3.3	4.1
1 ¼	42.9	2.6	3.3	4.1
1 ½	48.4	2.9	3.3	4.1
2	60.3	2.9	3.7	4.5
2 ½	76.2	3.3	3.7	4.5
3	88.9	3.3	4.1	4.9
3 ½	101.6	3.7	4.1	4.9
4	114.3	3.7	4.5	5.4
5	139.7	-	4.9	5.4
6	165.1	-	4.9	5.4

Tab 4. Material grade and wall thickness for steel pipes

7.4.5. Assessment of pipework condition

At every location of visual inspection, an assessment of corrosion shall be undertaken and recorded. The level of corrosion shall be assessed and categorised in accordance with the following table.

The worst case 'condition category' shall be recorded on the survey form.

Condition category	(% loss of wall thickness)
None	0%
Superficial	<25%
Moderate	≥25% to ≥50%
Severe	>50%

Tab 5. Condition category assessment

For example, the 'condition category' on a 2" nominal bore **unknown** grade pipe with **2mm depth** of corrosion is

Depth of corrosion = 2mm (measured with Pit Gauge)

Wall thickness = 2.9mm (from section 7.4.4 – unknown grade)

Level of metal loss = $2/2.9 = 0.68$ or 68%

Condition category = Severe

In the event of the corrosion being classified as '**severe**'

For SEVERE category a documented risk assessment shall be carried out before any maintenance activity is undertaken

- The SURVEYOR shall immediately contact his OPERATIONAL MANAGER. Before any maintenance activity is undertaken a site specific risk assessment shall be undertaken and documented.
- The OPERATIONAL MANAGER shall
 - Inform the local NETWORK INTEGRITY ENGINEER as soon as reasonably practicable.
 - Where the actual pipework wall thickness is unknown, and consequently the 'condition category' has been based on the default 'light' grade, the NETWORK INTEGRITY ENGINEER should consider determining the actual wall thickness using an appropriate technique, e.g. Non Destructive Testing, before the decision to decommission/replace is made. This may result in the 'condition category' being downgraded. Facilitating any additional assessment is the responsibility of the HEAD OF OPERATIONS
 - Arrange for the pipework to be subject to a supplementary leakage survey. The frequency of the leakage survey should be agreed and documented with the NETWORK INTEGRITY ENGINEER (maximum frequency = monthly).

These surveys shall continue until the pipework is either decommissioned, replaced or the condition category is reassessed, e.g. Superficial or Moderate.

- The HEAD OF CUSTOMER OPERATIONS is responsible for ensuring these additional surveys are programmed in the relevant work issue system.
- The pipework should be decommissioned/replaced as soon as reasonably practicable, but no later than the last day of the financial year following that in which it is discovered.

7.4.6. Inspection of areas of severe corrosion

Immediately
notify your
**OPERATIONAL
MANAGER** if
you think the
pipework
presents a short
term risk

Should the survey identify any areas of severe corrosion that indicated the pipe could fail catastrophically in the near future (a matter of days or weeks) it is the responsibility of the SURVEYOR to inform his OPERATIONAL MANAGER. The OPERATIONAL MANAGER shall advise more senior management, e.g. HEAD OF OPERATIONS, who shall ensure appropriate action to mitigate the risk is undertaken, e.g. disconnection.

Guidance can be found in Appendix D.

7.4.7. Sleeving and fire stopping of pipework through floors, walls, voids etc

During the site survey, particular note should be taken of the sleeving of pipework where it passes through the floor or other locations where it is possible that water could accumulate in such a manner that it causes an increased likelihood of corrosion of the pipework.

Additionally, consideration should be given of the potential for any escaping gas to travel within the building through holes in the fabric of the building. If such holes are observed, consideration should be given to identifying potential methods of sealing these holes.

If these features are noted during the site survey, they should be recorded in the comments boxes included on the survey form.

7.4.8. Survey completion

Where a survey, as defined above, can not be completed in its entirety at the first visit then additional two visits shall be undertaken, i.e. up to three in total. If the survey is completed on the second visit then a third is not required. In order to maximise the potential for access these additional visits should be undertaken

- In different weeks, e.g. 1st visit – week 1, 2nd visit – week 2, 3rd visit – week 3.
- On different days of the week, e.g. 1st visit – week 1, Monday, 2nd visit – week 2, Wednesday, 3rd visit – week 3, Thursday.

If after three visits a completed inspection has not been completed then the ENGINEER shall also sign the survey form. In signing the ENGINEER is confirming that all reasonably practicable measures have been undertaken to achieve completion.

Upon completion of the survey the OPERATIONAL MANAGER shall complete the 'Supervisor Survey Sign-off form' detailed in Appendix E. This shall be attached to the relevant high rise survey form and sent to the DATABASE ADMINISTRATOR.

The ENGINEER shall advise the DATABASE ADMINISTRATOR to ensure

- that a unique risk score is assigned, (the next survey scheduled according to Section 5, Table 2; Maximum inspection intervals), and
- advise the HEAD OF OPERATIONS

Appendix F provides further guidance on the actions required where a full survey can not be completed.

The HEAD OF CUSTOMER OPERATIONS shall write to the building owner stating NGG were unable to complete their inspection regime for the upstream gas pipework and unless subsequent appropriate access is made available the building owner, might in the event of an incident, be held partially responsible (see Appendix B – letter 3). A copy of the letter should be sent to, and retained by, the DATABASE ADMINISTRATOR.

7.4.9. Abandoned pipework

Where a building's internal pipework has been previously replaced the SURVEYOR should, as part of the visual inspection, as far as reasonably practicable ensure that abandoned pipework does not include any open ends, e.g. laterals are capped.

7.4.10. Pipework repairs

Where pipework repairs are identified during the survey process their condition should be visually assessed. If signs of damage are identified the SURVEYOR shall

- Undertake a gas detection check with an appropriate instrument.
- Record in the free text field of the survey form any gas readings and the condition of the repair.
- Where gas readings are detected then actions required in NGUK/EM/72 shall be followed.

8. Maintenance

The survey form shall be completed in full

In order to ensure that the appropriate remedial work is undertaken, it is important that the information on the survey form is completed as fully as possible and any additional information is also forwarded, e.g. photographic evidence.

The following table details the maintenance activities to be undertaken.

Maintenance activities		
Condition category	Maintenance activity	Record on survey form
None	None	Yes
Superficial	None	Yes
Moderate	Clean and paint or re wrap exposed accessible affected area	Yes
Severe	Immediately refer to OPERATIONAL MANAGER	Yes

Tab 6. Maintenance activities

Only approved repair techniques shall be used

Any leaking pipework and associated fittings identified during the inspection process shall be permanently repaired using National Grid approved techniques.

Incoming gas supply requires barhole survey

⚠ Refer to **National Grid Procedure – ‘National Grid Gas Work procedures for locating and repairing gas escapes on the network at pressures not exceeding 7 bar’ T/PR/EM/74**

8.1. Cathodic Protection

Where cathodic protection systems are installed they should be maintained in accordance with National Grid procedures.

⚠ Refer to **National Grid Procedure – ‘Management procedure for cathodic protection of buried steel systems’ T/PM/ECP/2.**

Further guidance is contained in Appendix G in relation to Cathodic Protection including the completion of a Cathodic Protection survey form (Appendix C).

8.2. Remedial action required by Building Owner

Where the survey identifies the building owner may not have maintained the property and placed our pipework at increased risk, the HEAD OF OPERATIONS shall inform the HEAD OF CUSTOMER OPERATIONS who shall ensure the building owner is notified and requesting work is completed to resolve any issues (see Appendix B – letter 2). The DATABASE ADMINISTRATOR shall be advised so the database can be updated with the letter ‘sent’ date.

8.3. Pipework replacement

Pipework shall be replaced in accordance with T/PM/REP/2.

Where the building risk score calculation is based on 'unknown' supply pipe condition, the HEAD OF OPERATIONS should consider utilising appropriate techniques to determine its condition in conjunction with a new pipework survey.

A new risk score shall be calculated and

- Where this is above , or equal to, the annual replacement threshold value, replacement shall continue as planned
- Where this is below the annual replacement threshold:
 - Replacement is not necessary and future surveying frequency is based on Table 2.
 - The annual threshold shall be reviewed to enable suitable building substitution.

9. IGEM G/5 Compliance

Although IGEM/G/5 is a guidance document intended for new buildings and new pipe work, the survey contains questions aimed towards identifying how closely the existing building and network pipes comply with the recommendations of IGE/G/5. Specifically the assessment will review compliance of

- The incoming gas supply
- Pipework (risers and laterals)
- Ventilation

These questions would generally be addressed during the on-site survey.

10. Survey validation and records

The relevant HEAD OF OPERATIONS shall ensure that appropriate processes and systems are in place to enable surveys to be validated by the appropriate OPERATIONAL MANAGER.

10.1. Validation

The completed survey form should be examined by the appropriate OPERATIONAL MANAGER.

The Operational Manager and the surveyor shall sign and date the survey form

Any issues requiring immediate action at this point shall be addressed. Responsibility for ensuring these are actioned resides with the OPERATIONAL MANAGER. These may include:

- Gas escape(s).
- Condition category 'severe'.
- Maintenance activities.

- Building affecting NGG asset.

The survey form (paper only) should be signed and dated by both the SURVEYOR and the OPERATIONAL MANAGER checking the survey form.

10.2. Records

A copy of the completed survey form shall be forwarded to DATABASE SUPERVISOR for inputting into the electronic database by the DATABASE ADMINISTRATOR.

An electronic copy of the survey form, site notes and photographs shall be stored. This stored record may be used to support further assessment of the building and to provide background information for subsequent surveys.

Work instructions for follow up actions shall be issued using the appropriate job issue system so that a record is retained of actions undertaken.

The head of customer operations shall ensure copies of all correspondence to property owners are retained and the database is updated with issue and receipt dates.

Records shall be retained in line with National Grid's Data Retention Policy.

 National Grid plc – Information and records management procedure

11. Training, Competence and Equipment

All persons shall be trained and deemed competent for the role they undertake in respect to this procedure.

11.1. Operational Manager and Engineer

As a minimum this will include

1. Successfully completing an approved relevant training course.
2. Peer coaching by a Subject Matter Expert (SME). This will include at least one site visits and survey form completion.
3. A desktop review with an T/PM/LC/21 competent operational manager of at least three completed survey forms prior to approval and submission to the DATABASE ADMINISTRATOR
4. The individual's Safety and Technical Competence (STC) framework should be updated at the next review.
5. The individual's Safety and Technical Competence (STC) framework should be updated at the next review.

The RESPONSIBLE ENGINEER will provide the DATABASE ADMINISTRATOR with a list of competent Operational Managers and Network Engineers prior to the commencement of the annual survey programme.

11.2. Surveyor

Typically this will include

1. Successfully completing an approved relevant training course.
2. Peer coaching by a Subject Matter Expert (SME). This will include joint site visits and survey form completion.
3. A recommendation from the SME to the Network Supervisor that the Surveyor is competent to follow the procedure on their own.

The OPERATIONAL MANAGER should update the Surveyors Safety and Technical Competence (STC) framework at the next review.

Continued competence will be monitored by the OPERATIONAL MANAGER through a combination of feedback from completed surveys and formal monitoring described in Section 12.

The SURVEYOR will require, in addition to standard issue PPE and toolbox, the following:

- Digital camera with large zoom (10x zoom recommended, as a 10x zoom equates to approximately the same magnification as a pair of 8x magnification binoculars)
- Pit Gauge
- Pipe callipers
- Copy of LC21 Final revision
- Fire brigade drop key

12. Monitoring

12.1. Operational assurance

The OPERATIONAL MANAGER should undertake

- 6 inspections per year of the surveys undertaken by each SURVEYOR.
- 3 of these inspections shall be in the form of joint inspections with the SURVEYOR.
- 3 of these inspections shall be in the form of inspections undertaken by the OPERATIONAL MANAGER to audit the information contained on the survey record against the building itself.

The Operational Manager should undertake

6 inspections per surveyor per year

The ENGINEERING AND INTEGRITY MANAGER should ensure an independent inspection of each SURVEYORS highest risk score survey, e.g. by the appropriate Network Integrity Engineer. This inspection shall include confirming the information collected during the survey has been accurately recorded in the appropriate information systems.

Arrangements for this inspection should be made in conjunction with the HEAD OF OPERATIONS and HEAD OF

CUSTOMER OPERATIONS and where practicable the relevant SURVEYOR should be present.

The RESPONSIBLE ENGINEER shall have appropriate systems in place to record the inspection results.

12.2. Programme completion

The RESPONSIBLE ENGINEER shall ensure appropriate systems are in place to enable confirmation that the annual survey programme has been completed

13. Implementation

Implementation timescale	
	Date
Approval	14 September 2011
Published	October 2011
Fully implemented	April 2012

Tab 7. Implementation schedule

14. Review

The RESPONSIBLE ENGINEER shall satisfy himself that the requirements of this procedure have been complied with on an annual basis.

Appendix A

High Rise Building Assessment Form

Property Name/Number			
Street/Road			
Town/City			
Postcode		Patch	
Building co-ordinates	Easting		Northing

Ownership				
Local Authority <input type="checkbox"/>	Housing Association <input type="checkbox"/>	Private landlord & tenants <input type="checkbox"/>	Individually owned Private <input type="checkbox"/>	Unknown <input type="checkbox"/>
Contact details				

Reason LC21 Survey Not Undertaken	
Unable to complete in THREE visits <input type="checkbox"/> Invalid address <input type="checkbox"/> Unable to gain access <input type="checkbox"/> Less than 6 storeys <input type="checkbox"/> No gas <input type="checkbox"/> Gas to SEPARATE central boiler room ONLY <input type="checkbox"/> I&C ONLY <input type="checkbox"/> Other <input type="checkbox"/>	Comments:

Building ID	
Year of previous survey	
ID of previous survey	
KEY ACTION POINTS	

Completed by (PRINT) ----- Date ----- Signed -----

Checked by (PRINT) ----- Date ----- Signed -----

Section 1: Description of the building

Building Details	
Approximate Construction Date	
Listed building	Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/>
Number of storeys (ground level and above)	
Approximate height of building (m)	
Supplies/Flats per storey	
Approximate total number of flats in the building	
Approximate footprint of building (mxm)	

Building Construction type		
Has a written assurance been obtained from building owner regarding whether, or not, the building is susceptible to disproportionate/progressive collapse?	Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/>	
If no such assurance has been confirmed, then what is the structural type of the building?	1.System built Modular <input type="checkbox"/> *	2.Masonry/Brick <input type="checkbox"/> *
	3.Concrete Frame/Steel Frame <input type="checkbox"/>	4. Not Determined <input type="checkbox"/> *
If advice has been received from the building owner. Is the building susceptible to disproportionate/progressive collapse	Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/>	

Basement/Cellar/Underground Garage	Yes <input type="checkbox"/> No <input type="checkbox"/>
Is the building a mixture of domestic properties and I&C usage?	Yes <input type="checkbox"/> No <input type="checkbox"/>

Section 2: Gas supplies to the building

Number of gas supplies DIRECTLY CONNECTED to the property	
Number of buried mains supplying gas directly to the building	

For EACH gas main providing gas to the building

General description of gas supplies to the property	
Pipe ID of buried mains providing gas to the building	<input type="checkbox"/> No mains ID
Material	CI/SI <input type="checkbox"/> Steel <input type="checkbox"/> DI <input type="checkbox"/> PE <input type="checkbox"/> Unknown <input type="checkbox"/>
Diameter (in inches)	
Operating pressure	
Year main was laid	
Ground coverage above the main (1m either side of the main for a distance of up to 5m from building line)	Sealed surface <input type="checkbox"/> Grass/open ground <input type="checkbox"/>
	Mixed sealed and open <input type="checkbox"/> Unknown <input type="checkbox"/>
Risk score from MRPS.	Specify: No Risk score <input type="checkbox"/>
If the pipe running to the building is metallic, is there any evidence that the main to the building line has cathodic protection installed?	No evidence that CP was installed <input type="checkbox"/>
	Evidence that CP was installed <input type="checkbox"/>
	Unknown <input type="checkbox"/>
	Not metallic pipe <input type="checkbox"/>
Number of leaks found during survey	

Recorded changes in the gas supplies to the property since the previous survey

Section 3: Gas supplies in the building (Page 1 of 2)

General description of gas supplies to the property		
Distribution gas pipe to single communal meter area with pipes then running to individual flats.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Distribution gas pipe to communal boiler for heating and/or hot water WITH gas supplies to individual flats	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Distribution gas pipe to communal boiler for heating and/or hot water WITHOUT gas supplies to individual flats	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Outlet/Sub deduct system (Primary meter with installation pipe work running to individual secondary meters)	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Vertical Riser with short stub lateral running to meter position within same duct/cupboard as the riser	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Vertical riser with simple laterals running to individual flats	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Vertical riser with horizontal risers running to laterals running to individual flats	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Horizontal riser connected to pipe supplying gas to the building, which is then connected to vertical risers.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Purpose built building containing multiple dwellings (e.g. tenement) that has had gas subsequently installed	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Large house that has subsequently been converted to flats and gas supply installed	Yes <input type="checkbox"/>	No <input type="checkbox"/>
High rise block of flats with large diameter steel pipe and smaller diameter copper risers running from the steel main	Yes <input type="checkbox"/>	No <input type="checkbox"/>

Summary of pipe types in the building	
Total Number of INTERNAL VERTICAL RISERS in building (Survey All)	
Total Number of INTERNAL HORIZONTAL RISERS in building (Survey All)	
Total Number of EXTERNAL VERTICAL RISERS in building (Survey All)	
Total Number of Laterals in building (Survey at least 2 per riser)	
Number of laterals surveyed in total	
Estimated total length of lateral pipes in the building (m)	

Section 3: Gas supplies in the building (Page 2 of 2)

Gas usage in flats only		
Gas used for cooking	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Gas used for heating	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Gas used for hot water	Yes <input type="checkbox"/>	No <input type="checkbox"/>

Section 4: INTERNAL VERTICAL RISERS (Page 1 of 4)

Please complete this section for each/all INTERNAL VERTICAL RISER

Pipe Location/identifier		
Address		
Vertical Riser Location	Easting:	Northing:

Pipe entering the building – To be completed when riser directly connected to the incoming gas supply

Riser directly connected to supply pipe	Yes <input type="checkbox"/> No <input type="checkbox"/>
Mains ID	No Mains ID <input type="checkbox"/>
Method of entry to building	Above ground <input type="checkbox"/> Below ground <input type="checkbox"/> Basement <input type="checkbox"/>

Pipe construction					
Total Pipe Length (m)					
Pipe Diameter (predominant) inches					
Pipe Material					
Bare Steel <input type="checkbox"/>	Painted Steel <input type="checkbox"/>	Plastic Wrapped Steel. (Yellow PE Clad) <input type="checkbox"/>	Bituminous Steel <input type="checkbox"/>	Galvanized Steel <input type="checkbox"/>	Tape Wrapped Steel <input type="checkbox"/>
Mixture of steel types <input type="checkbox"/>			Copper <input type="checkbox"/>	PE <input type="checkbox"/>	Other <input type="checkbox"/>

Additional data for Steel pipes only				
Type of joints				
Welded <input type="checkbox"/>	Flanged <input type="checkbox"/>	Threaded <input type="checkbox"/>	Mixture of joint types used <input type="checkbox"/>	Not steel <input type="checkbox"/>
Are joints suitably protected (wrapped/painted) from corrosion				
All <input type="checkbox"/>	Some <input type="checkbox"/>	None <input type="checkbox"/>	Not steel <input type="checkbox"/>	

Section 4: INTERNAL VERTICAL RISERS (Page 2 of 4)

Pipe access	
Approximate % of pipe visually surveyed	0% <input type="checkbox"/> 1-10% <input type="checkbox"/> 10-25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/>
Locations where inspections have been undertaken.	

Ventilation of the pipe	
Pipe runs through internal void that has ventilation openings to:	Outside the building <input type="checkbox"/> Inside the building <input type="checkbox"/> No ventilation openings <input type="checkbox"/> Not determined <input type="checkbox"/>

Sealing of pipes between floors				
Pipe passing Through Solid Floors	Yes <input type="checkbox"/> No <input type="checkbox"/> Not Seen <input type="checkbox"/>			
Nature of sleeve around gas pipe where it runs through the floor?				
No sleeve <input type="checkbox"/>	Plastic sleeve <input type="checkbox"/>	Other type of sleeve <input type="checkbox"/>	None <input type="checkbox"/>	Unknown or N/A <input type="checkbox"/>
For those pipes that DO have a sleeve, what is the nature of fill inside sleeve				
Mastic <input type="checkbox"/>	Concrete <input type="checkbox"/>	Other <input type="checkbox"/>	None <input type="checkbox"/>	Unknown or N/A <input type="checkbox"/>
For those pipes that DO NOT have a sleeve, what is the nature of the fill around the pipe				
Mastic <input type="checkbox"/>	Concrete <input type="checkbox"/>	Other <input type="checkbox"/>	None <input type="checkbox"/>	Unknown or N/A <input type="checkbox"/>

Pipe Environment		
Damp/Wet <input type="checkbox"/>	Localised dampness <input type="checkbox"/>	Always Dry <input type="checkbox"/>

Section 4: INTERNAL VERTICAL RISERS (Page 3 of 4)

General Pipe Condition steel pipes only	
Severe corrosion <input type="checkbox"/>	Moderate corrosion <input type="checkbox"/> Superficial only <input type="checkbox"/> None <input type="checkbox"/>
If areas of severe/moderate corrosion are present, add details to specific pipe corrosion table	
Number of existing repairs visible	
Were any of the repairs damaged?	Yes <input type="checkbox"/> No <input type="checkbox"/> If YES, add details in comments box
Are repairs required to corrosion protection coatings and wrappings?	Yes <input type="checkbox"/> No <input type="checkbox"/> If YES, add details to specific pipe corrosion table.
Number of leaks on this riser found during survey	

Specific pipe corrosion (add further details on separate sheet if required)				
Location	Description of corrosion	Pipe diameter	Corrosion depth	Is an immediate repair required?
				Yes <input type="checkbox"/> No <input type="checkbox"/>
				Yes <input type="checkbox"/> No <input type="checkbox"/>
				Yes <input type="checkbox"/> No <input type="checkbox"/>
				Yes <input type="checkbox"/> No <input type="checkbox"/>
				Yes <input type="checkbox"/> No <input type="checkbox"/>
				Yes <input type="checkbox"/> No <input type="checkbox"/>
				Yes <input type="checkbox"/> No <input type="checkbox"/>
				Yes <input type="checkbox"/> No <input type="checkbox"/>

Section 4: INTERNAL VERTICAL RISERS (Page 4 of 4)

Riser valves and emergency isolation			
Has the riser got an external below ground valve (SIV/PIV)?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Has the riser got an above ground internal emergency shut off valve (ESV)(i.e. an IIV or NRIV in G/5 parlance)	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
If there is an ESV present:			
i) Where is it located?			
ii) Is the above ground emergency shut off valve accessible (i.e. not in a locked room)	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input type="checkbox"/>
iii) Is the above ground emergency shut off valve secure (i.e. behind a glass panel)	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input type="checkbox"/>
iv) Is the above ground emergency shut off valve resistant to unauthorised operation after being shut?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input type="checkbox"/>

Comments

Section 5: EXTERNAL VERTICAL RISERS (Page 1 of 3)

Please complete this section for each/all EXTERNAL VERTICAL RISER

Pipe Location/identifier		
Address		
Vertical Riser Location	Easting:	Northing:

Pipe to the building -	
External Riser connected directly to supply pipe	Yes <input type="checkbox"/> No <input type="checkbox"/>
If YES, Mains ID of the supply pipe	No Mains ID <input type="checkbox"/>

Pipe construction					
Total Pipe Length (m)					
Pipe Diameter (predominant)					
Pipe Material					
Bare Steel <input type="checkbox"/>	Painted Steel <input type="checkbox"/>	Plastic Wrapped Steel. (Yellow PE Clad) <input type="checkbox"/>	Bituminous Steel <input type="checkbox"/>	Galvanized Steel <input type="checkbox"/>	Tape Wrapped Steel <input type="checkbox"/>
Mixture of steel types <input type="checkbox"/>			Copper <input type="checkbox"/>	PE <input type="checkbox"/>	Other <input type="checkbox"/>

Additional data for Steel pipes only				
Type of joints				
Welded <input type="checkbox"/>	Flanged <input type="checkbox"/>	Threaded <input type="checkbox"/>	Mixture of joint types used <input type="checkbox"/>	Not steel <input type="checkbox"/>
Are joints suitably protected (wrapped/painted) from corrosion				
All <input type="checkbox"/>	Some <input type="checkbox"/>	None <input type="checkbox"/>	Not steel <input type="checkbox"/>	

Pipe access	
Approximate % of pipe visually surveyed	0% <input type="checkbox"/> 1-10% <input type="checkbox"/> 10-25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/>
Locations where inspections have been undertaken.	

Section 5: EXTERNAL VERTICAL RISERS (Page 2 of 3)

Pipe Environment		
Damp/Wet <input type="checkbox"/>	Localised dampness <input type="checkbox"/>	Always Dry <input type="checkbox"/>

General Pipe Condition steel pipes only	
Severe corrosion <input type="checkbox"/>	Moderate corrosion <input type="checkbox"/> Superficial only <input type="checkbox"/> None <input type="checkbox"/>
If areas of severe/moderate corrosion are present, add details to specific pipe corrosion table	
Number of existing repairs visible	
Were any of the repairs damaged?	Yes <input type="checkbox"/> No <input type="checkbox"/> If YES, add details in comments box
Are repairs required to corrosion protection coatings and wrappings?	Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, add details to specific pipe corrosion table.
Number of leaks on this riser found during survey	

Specific pipe corrosion (add further details on separate sheet if required)				
Location	Description of corrosion	Pipe diameter	Corrosion depth	Is an immediate repair required?
				Yes <input type="checkbox"/> No <input type="checkbox"/>
				Yes <input type="checkbox"/> No <input type="checkbox"/>
				Yes <input type="checkbox"/> No <input type="checkbox"/>
				Yes <input type="checkbox"/> No <input type="checkbox"/>
				Yes <input type="checkbox"/> No <input type="checkbox"/>

GRP Intact & Fitted Correctly (PE ONLY)	Yes <input type="checkbox"/> No <input type="checkbox"/>
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Riser valves and emergency isolation			
Has the riser got an external below ground isolation valve (SIV/PIV)	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Has the riser got an above ground emergency shut off valve (IIV or NRIV)	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
	If Yes – Location		
Is the above ground emergency shut off valve accessible (i.e. not in a locked room)	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input type="checkbox"/>
Is the above ground emergency shut off valve secure (i.e. behind a glass panel)	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input type="checkbox"/>
Is the above ground emergency shut off valve resistant to unauthorised operation after being shut?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input type="checkbox"/>

Comments

Section 6: HORIZONTAL RISERS (Page 1 of 3)

Please complete this section for each/all HORIZONTAL RISER.

A horizontal riser can be connected directly to the buried main feeding the building or to a vertical riser. If there is more than one vertical riser in the building, please indicate which vertical riser each horizontal riser is attached to.

Address	
Horizontal Riser Location (Record either the Easting & Northing of vertical riser that the Horizontal Riser is fed from or that it is connected directly to the buried main	Easting: _____ Northing: _____ Connected to buried gas main <input type="checkbox"/>
Horizontal Riser location	Floor: _____

Pipe entering the building – to be completed when the horizontal riser connects to the buried gas main	
Riser directly connected to supply pipe	Yes <input type="checkbox"/> No <input type="checkbox"/>
Mains ID	Specify: No Mains ID <input type="checkbox"/>
Method of entry to building	Above ground <input type="checkbox"/> Below ground <input type="checkbox"/> Basement <input type="checkbox"/>

Pipe construction					
Total Pipe Length (m)					
Pipe Diameter (predominant)					
Pipe Material					
Bare Steel <input type="checkbox"/>	Painted Steel <input type="checkbox"/>	Plastic Wrapped Steel. (Yellow PE Clad) <input type="checkbox"/>	Bituminous Steel <input type="checkbox"/>	Galvanized Steel <input type="checkbox"/>	Tape Wrapped Steel <input type="checkbox"/>
Mixture of steel types <input type="checkbox"/>			Copper <input type="checkbox"/>	PE <input type="checkbox"/>	Other <input type="checkbox"/>

Additional data for Steel pipes only				
Type of joints				
Welded <input type="checkbox"/>	Flanged <input type="checkbox"/>	Threaded <input type="checkbox"/>	Mixture of joint types used <input type="checkbox"/>	Not steel <input type="checkbox"/>
Are joints suitably protected (wrapped/painted) from corrosion				
All <input type="checkbox"/>	Some <input type="checkbox"/>	None <input type="checkbox"/>	Not steel <input type="checkbox"/>	

Section 6: HORIZONTAL RISERS (Page 2 of 3)

Pipe access	
Approximate % of pipe visually surveyed	0% <input type="checkbox"/> 1-10% <input type="checkbox"/> 10-25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/>
External or Internal Position	External <input type="checkbox"/> Internal <input type="checkbox"/>

Internal Horizontal Riser	
Pipe runs through internal void that has ventilation openings to:	Outside the building <input type="checkbox"/> Inside the building <input type="checkbox"/> No ventilation openings <input type="checkbox"/> Not determined <input type="checkbox"/> N/A <input type="checkbox"/>
Passing Through Solid walls	Yes <input type="checkbox"/> No <input type="checkbox"/> Not Seen <input type="checkbox"/> N/A <input type="checkbox"/>
Wall sealing material	
Mastic <input type="checkbox"/>	Concrete <input type="checkbox"/> Other <input type="checkbox"/> None <input type="checkbox"/> Unknown or N/A <input type="checkbox"/>

Pipe Environment		
Damp/Wet <input type="checkbox"/>	Localised dampness <input type="checkbox"/>	Always Dry <input type="checkbox"/>

General Pipe Condition steel pipes only			
Severe corrosion <input type="checkbox"/>	Moderate corrosion <input type="checkbox"/>	Superficial only <input type="checkbox"/>	None <input type="checkbox"/>
If areas of severe/moderate corrosion are present, add details to specific pipe corrosion table			
Number of existing repairs visible			
Were any of the repairs damaged?	Yes <input type="checkbox"/> No <input type="checkbox"/> If YES, add details in comments box		
Are repairs required to corrosion protection coatings and wrappings?	Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, add details to specific pipe corrosion table.		
Number of leaks on this riser found during survey			

Section 6: HORIZONTAL RISERS (Page 3 of 3)

Specific pipe corrosion (add further details on separate sheet if required)				
Location	Description of corrosion	Pipe diameter	Corrosion depth	Is an immediate repair required?
				Yes <input type="checkbox"/> No <input type="checkbox"/>
				Yes <input type="checkbox"/> No <input type="checkbox"/>
				Yes <input type="checkbox"/> No <input type="checkbox"/>
				Yes <input type="checkbox"/> No <input type="checkbox"/>
				Yes <input type="checkbox"/> No <input type="checkbox"/>

Riser valves and emergency isolation			
Has the riser got an external below ground valve (SIV/PIV)?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Has the riser got an above ground internal emergency shut off valve (ESV)(i.e. an IIV or NRIV in G/5 parlance)	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
If there is an ESV present:			
i) Where is it located?			
ii) Is the above ground emergency shut off valve accessible (i.e. not in a locked room)	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input type="checkbox"/>
iii) Is the above ground emergency shut off valve secure (i.e. behind a glass panel)	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input type="checkbox"/>
iv) Is the above ground emergency shut off valve resistant to unauthorised operation after being shut?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input type="checkbox"/>

Comments

Section 7: LATERAL (Page 1 of 2)

Please complete this section for each/all LATERAL surveyed. If there is more than one vertical riser in the building, please indicate which vertical riser each LATERAL is attached to.

Address	
Lateral pipe Location (Record Easting & Northing of vertical riser that the lateral is attached to)	Easting: Northing:
Lateral Riser location	Floor:
External or Internal Position	External <input type="checkbox"/> Internal <input type="checkbox"/>

Pipe access	
Approximate % of pipe visually surveyed	0% <input type="checkbox"/> 1-10% <input type="checkbox"/> 10-25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/>

Pipe construction					
Total Pipe Length (m)					
Pipe Diameter (predominant) (inches)					
Pipe Material					
Bare Steel <input type="checkbox"/>	Painted Steel <input type="checkbox"/>	Plastic Wrapped Steel. (Yellow PE Clad) <input type="checkbox"/>	Bituminous Steel <input type="checkbox"/>	Galvanized Steel <input type="checkbox"/>	Tape Wrapped Steel <input type="checkbox"/>
Mixture of steel types <input type="checkbox"/>			Copper <input type="checkbox"/>	PE <input type="checkbox"/>	Other <input type="checkbox"/>

Additional data for Steel pipes only				
Type of joints				
Welded <input type="checkbox"/>	Flanged <input type="checkbox"/>	Threaded <input type="checkbox"/>	Mixture of joint types used <input type="checkbox"/>	Not steel <input type="checkbox"/>
Are joints suitably protected (wrapped/painted) from corrosion				
All <input type="checkbox"/>	Some <input type="checkbox"/>	None <input type="checkbox"/>	Not steel <input type="checkbox"/>	

Pipe Environment		
Damp/Wet <input type="checkbox"/>	Localised dampness <input type="checkbox"/>	Always Dry <input type="checkbox"/>

Section 7: LATERAL (Page 2 of 2)

General Pipe Condition steel pipes only			
Severe corrosion <input type="checkbox"/>	Moderate corrosion <input type="checkbox"/>	Superficial only <input type="checkbox"/>	None <input type="checkbox"/>
If areas of severe/moderate corrosion are present, add details to specific pipe corrosion table			
Number of existing repairs visible			
Were any of the repairs damaged?	Yes <input type="checkbox"/> No <input type="checkbox"/> If YES, add details in comments box		
Are repairs required to corrosion protection coatings and wrappings?	Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, add details to specific pipe corrosion table.		
Number of leaks on this lateral found during survey			

Specific pipe corrosion (add further details on separate sheet if required)				
Location	Description of corrosion	Pipe diameter	Corrosion depth	Is an immediate repair required?
				Yes <input type="checkbox"/> No <input type="checkbox"/>

Comments

Section 8: Leakage Survey details (Page 1 of 1)

External survey	
Was the survey carried out?	Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, append sheet recording survey undertaken. If No, contact Supervisor and indicate reason why in box below.
Number of leaks found? For each leak identified: What was the source of the escape What action was taken:	

Internal survey	
Was the survey carried out?	Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, append sheet indicating location of readings taken. If NO, contact Supervisor and indicate reason why in box below.
Number of indication/leaks found? For each leak identified what was the source of the escape What action was taken:	Distribution network pipe work <input type="checkbox"/> Meter area <input type="checkbox"/> Installation pipe work and appliances <input type="checkbox"/> Not identified during the survey <input type="checkbox"/>

Leakage on distribution network needs to be ascribed to the specific riser.

Comments

Section 9: IGEM/G/5 compliance for network pipes and other issues (Page 1 of 2)

This section involves some summarising of the data for the individual pipes that have been collected earlier as well as recording other observations of relevance to UKD.

Use comments box to clarify/expand on any observations made during the survey and Section 10 to record observations that may require a more thorough examination of the property.

Do all steel horizontal pipes have supports at least once every 3m? If no add further details in section 10.	Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> N/A <input type="checkbox"/>
Do all steel vertical pipes have supports at least once every 2.5m? If no add further details in section 10.	Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> N/A <input type="checkbox"/>
Is any internal distribution pipe work NOT made of steel?	Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/>
Is any copper distribution pipework located in areas where it is susceptible to being stolen or subject to interference damage? If yes add further details in section 10.	Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> N/A <input type="checkbox"/>
Is any copper distribution pipework located on an escape route? If yes add further details in section 10.	Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> N/A <input type="checkbox"/>
Are there any vertical pipes made of copper that are greater than 20m long? If yes add further details in section 10.	Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> N/A <input type="checkbox"/>
Does any network pipeline pass through an individual dwelling other than one it supplies? If so, Is it an all welded pipeline Is the pipe work in the dwelling within a ventilated sealed duct?	Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> N/A <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> N/A <input type="checkbox"/>
Is the steel pipeline jointing method compliant with G/5? If no add further details in section 10.	Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> N/A <input type="checkbox"/>
Where a buried metallic gas main (supply pipe) enters the building, does it appear to be wrapped?	Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Above ground entry <input type="checkbox"/> Not a metallic main to the building <input type="checkbox"/>

Section 9: IGEM/G/5 compliance for network pipes and other issues (Page 2 of 2)

Is there evidence that the buried sections of metallic mains entering the building has cathodic protection applied?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Unknown <input type="checkbox"/>	Not a metallic main to the building <input type="checkbox"/>
Is the network pipeline within a space that has adequate natural ventilation?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Are all the network pipes sleeved where they pass through a structural element (wall/floor)?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Are ALL risers protected by an external below ground PIV (SIV)	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Are ALL risers protected by an accessible internal valve (IIV or NRIV)	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Unknown <input type="checkbox"/>	
As indicated by the building owner, is the building susceptible to disproportionate/progressive collapse?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Were any open ends observed on distribution pipework that had previously been abandoned? If yes add further details in section 10.	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input type="checkbox"/>	
Are there any features of the building that are causing damage/deterioration of the NGG's assets?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Unknown <input type="checkbox"/>	

Comments

10: Other issues identified during the site survey (Page 1 of 1)

This section allows the surveyor to record any issues that may be encountered during the site survey that are not related to the distribution network, e.g. corrosion on installation pipe work or not directly to the risk calculations for the pipework as well as providing more detailed information to some of the issues raised in the survey.

Issue	Action

Appendix B Proforma Letters

Letter 1 – from NGG to the building owner

High Rise Buildings (6 storeys or greater)

National Grid Gas plc requests your co-operation in the interests of the health and safety of the residents of the building situated at:

XXXXXXXXXXXXXXXXXXXXXXX

National Grid Gas plc owns and operates the local gas distribution network which supplies gas to this building. Its' ownership extends up to, and includes, the Emergency Control Valve (ECV) which is usually located just before the primary gas meter in the residents property

National Grid Gas plc wants to ensure the safety of the residents of the building from any deterioration of its gas pipeline and therefore needs to determine whether there are any building specific issues which may have an adverse impact on either:

- (a) the gas pipework, e.g. progressive collapse, water ingress in the vicinity of the gas pipework
- (b) National Grid Gas representatives, e.g. asbestos.

In order that any building specific work remedied in a timely manner National Grid Gas would appreciate your response to this request within 28 days by completing the enclosed questionnaire and returning it in the SAE provided. If you have transferred responsibility/ownership to a third party, e.g. a Housing Association, I would be grateful if you could forward this correspondence on to them.

It should be noted that National Grid Gas is working closely with the Health and Safety Executive (HSE) in connection with this piece of work and that the HSE is overseeing the work undertaken and may wish to monitor responses received.

Should you require any further information or clarification on this matter please contact ian.aldridge@uk.ngrid.com.

Thank you for your assistance in this matter

High Rise Buildings (6 storeys or greater)

Building details

1. Building Address (incl. postcode).
2. Date of building construction.
3. Building Owner:
4. Building Owner address:
5. Site contact name (e.g. caretaker)
6. Site contact address and telephone number:
7. Is the building in an approved conservation area? YES or NO*
8. Is the building subject to listed building status? YES or NO*

If YES, please provide details

9. Has the building been subject to a regular maintenance and inspection regime since construction? YES/NO*

If YES, please provide details.

10. Are structural drawing, including details of the gas pipework available? Yes or NO*

Previous history

11. Has any works been carried out that may have had an impact on NGG's pipework, e.g. reduced access? YES or NO*

If YES, please complete the following table

Description	In your opinion has this had a <u>positive</u> or <u>negative</u> impact on NGG's pipework.	If <u>negative</u> , please describe the rectification actions you plan to undertake, including timescales.

12. Is the environment in which our pipework is located always dry. Particular attention should be paid to where any pipework passes through floors? YES or NO*

If NO, please complete the following table

Location	Description.	Please describe the actions you plan to undertake, including timescales

13. In undertaking the survey our engineers will need inspect all our pipework. Are there any potential risks that NGG engineers need to be aware of prior to commencing the survey, e.g. asbestos? YES or NO*

If YES, please complete the following table

Location	Description of risk.	Any actions you suggest NGG engineers should take to mitigate the risk

Note: If asbestos is present please supply a copy of the relevant sections of your Asbestos register

Future plans

14. Do you have any future plans for the property which may have an impact on our pipework, e.g. building demolition, refurbishment, part of 'Hidden Homes' programme? YES/NO*

If YES, please complete the following table

Description	Planned timescales.	Impact on NGG's pipework

I certify that the above is a true and accurate record in relation to the identified building.

Name (Print):

Signed:

Position (Print):

Organisation (Print)

Date:

Contact details

Email address:

Telephone number.

Office

Mobile.

Letter 2 – from NGG to the building owner outlining required remedial works

High Rise Buildings (6 storeys or greater)

Thank you for facilitating the arrangements for the survey to be undertaken by National Grid Gas Plc on its gas pipework at the building situated at xxxxxxxxxxxxxxxx on the (date).

National Grid Gas is working closely with the Health and Safety Executive (HSE) to formulate a programme of surveys on high rise buildings in order to identify any actual or potential damage to the gas pipeline in the interests of the health and safety of the residents.

The survey undertaken at xxxxxxxxxxxxxxx identified that xxxxxxxxxxxxxxx is adversely affecting the integrity of the gas pipework and requires (immediate remedial action?) by the (building/property) owner.

Please provide confirmation to National Grid Gas within (28/56/72 days) on the form enclosed that the remedial work has been undertaken.

Finally, causing damage to a gas pipeline is a criminal offence contrary to the Pipeline Safety Regulations 1996, Regulation 15 which provides that 'no person shall cause such damage to a pipeline as may give rise to a danger to persons' as such National Grid Gas would very much appreciate your co-operation in this matter.

High Rise Buildings (6 storeys or greater)**Building details**

1. Building Address (incl. postcode).

2. Building Owner:

Following the recent survey by NGG on the above building I can confirm that the following actions have been completed.

Description	Impact on NGG pipework	Completed by and date

I certify that the above is a true and accurate record in relation to the identified building.

Name (Print):

Signed:

Position (Print):

Organisation (Print)

Date:

Contact details

Email address:

Telephone number.

Office

Mobile.

Letter 3 – from NGG to the building owner outlining access has not been achieved

We refer to our letter of the xxx requesting that you facilitate access arrangements to allow National Grid Gas to undertake a survey of its gas pipework at the building situated at xxxxxxxxxxxx

National Grid Gas plc owns and operates the local gas distribution network which supplies gas to this building. Its' ownership extends up to, and includes, the Emergency Control Valve (ECV) which is usually located just before the primary gas meter in the residents property

Access to the building is required to assess the integrity of the gas pipeline and to determine whether there are any building specific issues which may have an adverse impact on it.

This piece of work is being undertaken to protect the health and safety of the residents from any adverse impact from the gas pipeline and your urgent co-operation is requested. It should be noted that National Grid Gas is working closely with the Health and Safety Executive (HSE) in connection with a programme to survey gas pipelines in high rise buildings and the HSE is overseeing work undertaken and may wish to monitor responses received.

We look forward to hearing from you within the next 14 days with details of dates when National Grid Gas can have access to the building. In the event that we do not hear from you we will be forced, in the interests of the safety to the public, to consider taking legal proceedings.

Should you require any further information or clarification on this matter please contact ian.aldridge@uk.ngrid.com.

Appendix C Cathodic Protection survey form

Contact details	
Supervisor name:	Contact number:
Surveyor name:	Contact number:
Date survey undertaken:	

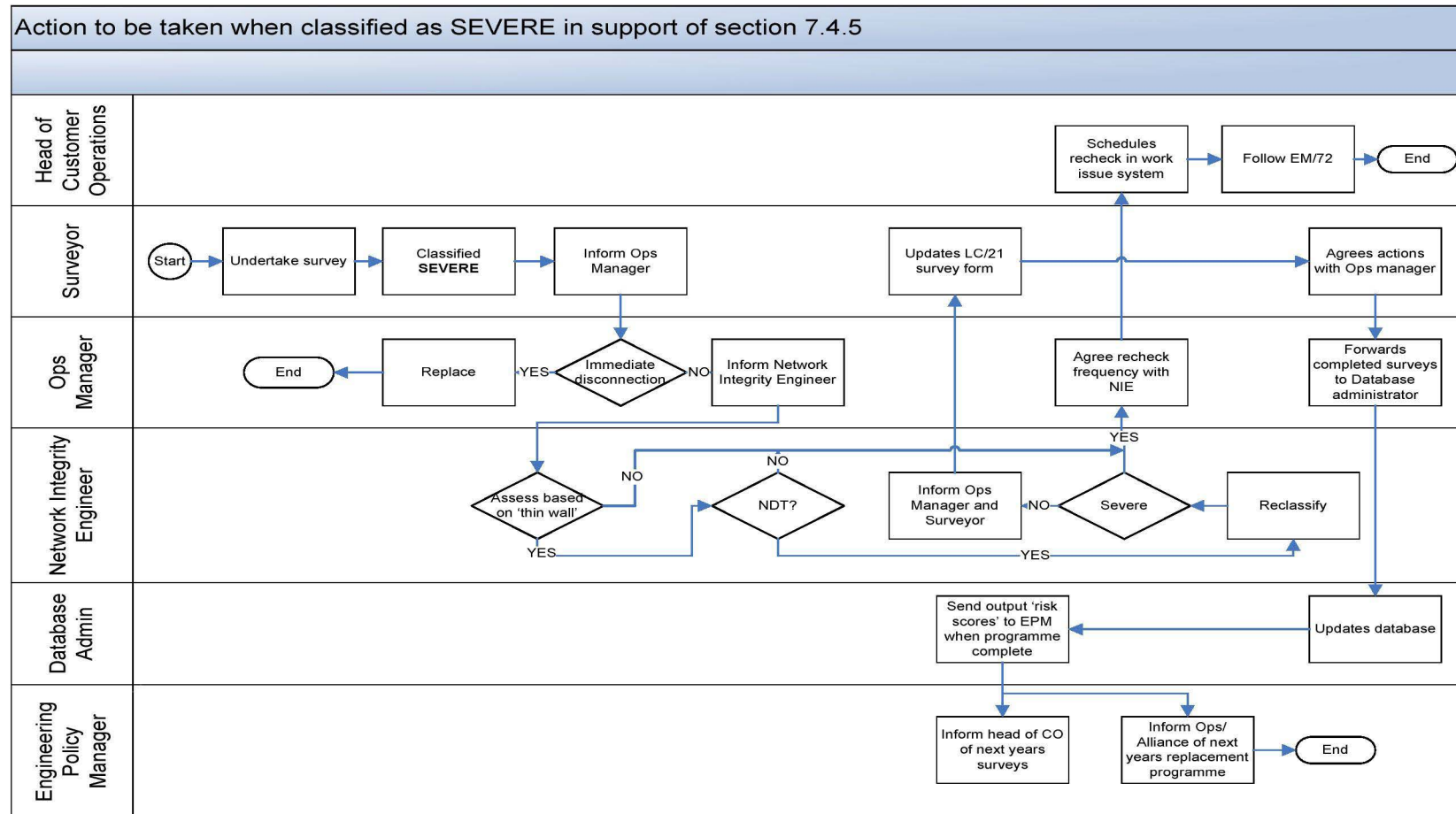
Property details		
Property Name/Number		
Street/Road		
Town/City		
Postcode		Patch:
Building co-ordinates	Easting:	Northing:
Building ID number		

General description of gas supply to building				
Pipe material	Cast iron	Spun iron	Ductile iron	Steel
Diameter				
Date laid				
Pressure tier				

CP Surveyor details	
Name:	Contact number:

CP Survey	
Location of test point:	
CP OPERATIONAL	CP NOT OPERATIONAL
Date of survey:	Signature

Appendix D – Severe corrosion flowchart

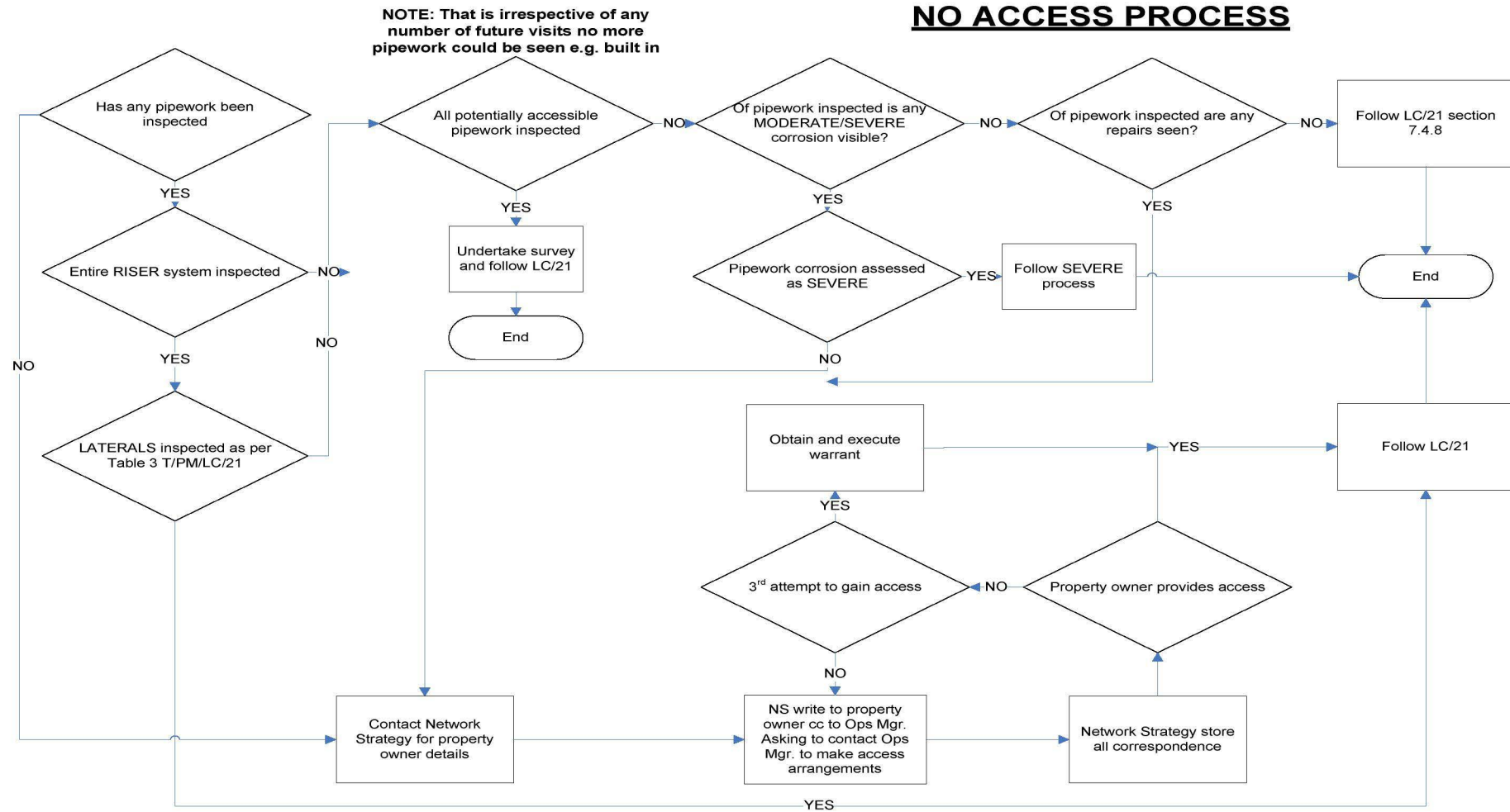


13/09/2011

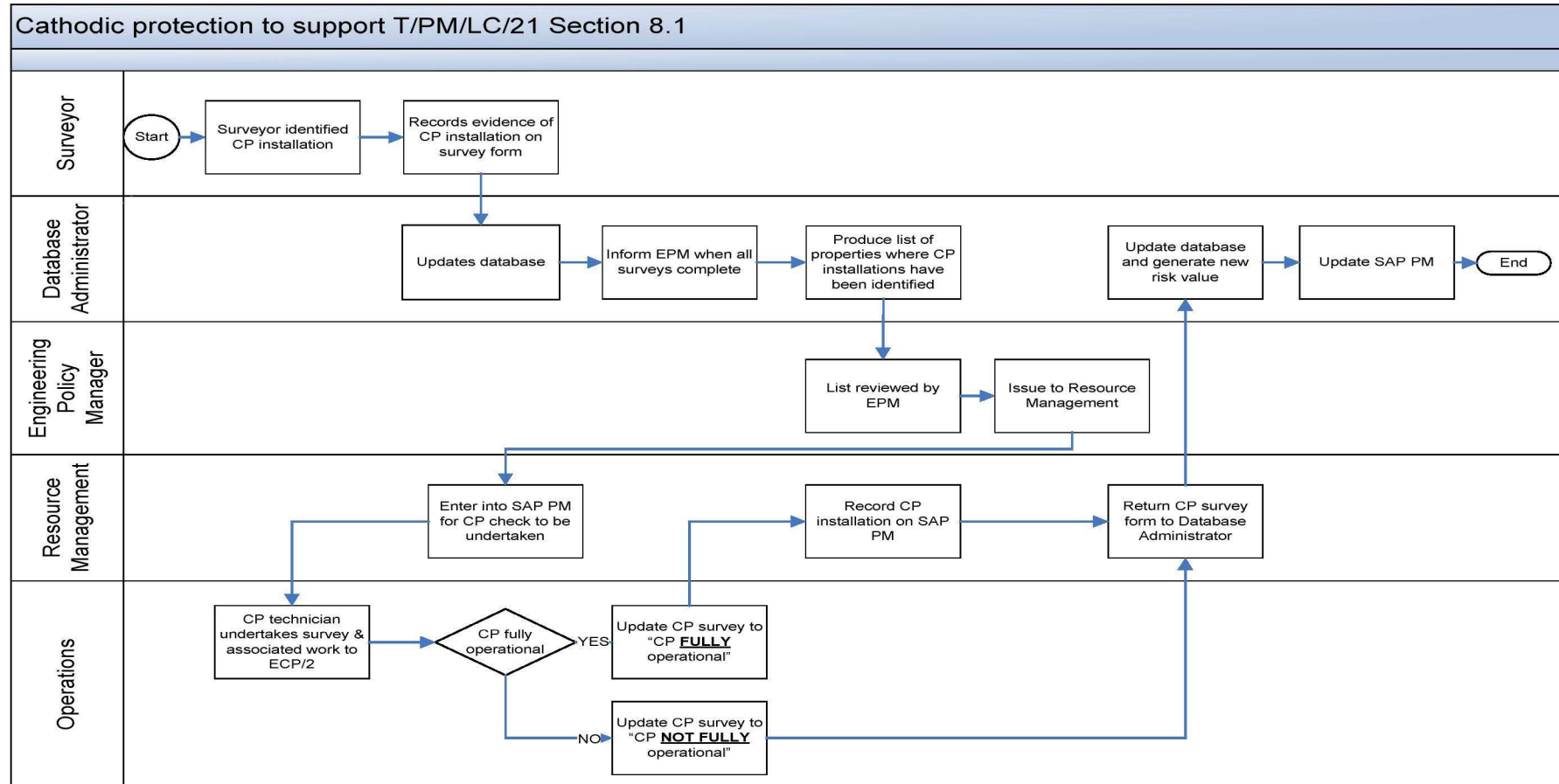
Appendix E – Supervisor sign off form

Part A - Survey details			
Surveyor:	Date:		
Part B – Building details			
LC/21 Building reference number:			
Property name/number:			
Street/Road:			
Town/City:			
Postcode:			
Part C – Survey completion			
Was the survey completed in accordance with LC/21 (Table 3)	YES (go to part E)	NO (go to part D)	
Part D - Survey completion – If NO compliance with Section 7.4.8 is required			
Date:	Surveyor:		
Date:	Surveyor:		
Date:	Surveyor:		
Specify measures taken to gain access:			
Network Engineer (L7) – Name:			
Signature:	Date:		
Part E – Leakage survey			
Were gas readings recorded?	YES	NO	
If YES	Reading(s)	Location(s)	
Part F – Pipework condition – Categorisation as per section 7.4.5			
NONE	SUPERFICIAL	MODERATE	SEVERE
If MODERATE detail maintenance actions taken and their location			
If SEVERE detail maintenance actions taken and their location			
Network Integrity Engineer notified – DATE:			
Actions taken by Network Integrity Engineer:			
Operational Manager notified – DATE:			
Actions taken by Operational Manager:			
Part G – Network Supervisor (L6) sign off			
Name:	Signature:	Date:	

Appendix F – No access flowchart



Appendix G – Cathodic protection flowchart



13/09/2011

End note

Comments

Comments and queries regarding the technical content of this document should be directed to:

Safety and Engineering Registrar

SHE Directorate

National Grid

National Grid House

Warwick Technology Park

Gallows Hill

Warwick

CV34 6DA

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