

MANAGEMENT PROCEDURE FOR THE CLASSIFICATION AND MAINTENANCE OF VALVES IN PIPELINES OPERATING AT PRESSURES UP TO AND INCLUDING 7 BAR



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## Version Control

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## Implementation

Implementation timescales	
Approved	June 2016
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## Training needs analysis

Identified users Specifically which roles must have an understanding of this Procedure	Level of understanding Aware Does Controls Manages	Training document / presentation	Dissemination method A, M email link and brief D, C brief and record
Corporate Manager	Aware	Involvement through approval process and key criteria detailed in briefing pack	A
Senior Manager	Manages	As above	A,M
First Line Manager	Controls	Key criteria detailed in briefing pack (Manager Technical Updates)	A,M,D,C
Competent Person	Controls	Key criteria detailed in briefing pack (Manager Technical Updates)	A,M,D,C

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## Document Summary

### Purpose

This management procedure was approved by the Engineering Policy Manager, in June 2016 for use throughout National Grid Gas

Users should ensure that they are in possession of the latest edition and related bulletins by referring to the document library of Safety and Engineering documents available on the company Infonet.

Compliance with this safety and engineering document does not confer immunity from prosecution for breach of statutory or other legal obligations.

### Disclaimer

This safety and engineering document is provided for use by National Grid Gas and such of its contractors as are obliged by the terms and conditions of their contracts to comply with this document.

Where this document is used by any other party it is the responsibility of that party to ensure that this document is correctly applied.

### 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

### Responsibilities

All National Grid Gas employees and contractors involved in classification and maintenance of valves in pipelines operating at pressures up to and including 7 bar shall follow the procedures detailed in this document

### Background

This management procedure details the requirements for classification, recording and maintenance of mains and service valves in distribution pipeline networks operating at pressures up to and including 7 barg.

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## 1. Scope

This management procedure details the requirements for classification, recording and maintenance of mains and service valves in distribution pipeline networks operating at pressures up to and including 7 barg.

Valves used for the isolation/maintenance of equipment within Pressure Reduction Installations (PRI), whether buried or above ground whilst being referenced are not covered by the provisions of this document.



**T/PM/MAINT/2 PART 2 - Management Procedure for  
Maintenance of Pressure Regulating Installations Part 2 -  
Installations with Inlet Pressures at 7bar and Below  
(Excluding Service Regulator Installations supplying less  
than 10 customers**

Requirements for the installation of new valves are given in



**T/PM/MSL/1 - National Grid Management Procedure for  
Main Laying and Service Laying.**

## 2. Classification/Installation requirements

The person designing the network or proposing alterations to any existing valve(s) shall determine the classification(s) of such valves in accordance with the following descriptions (Refer to Appendix B). In addition they shall also ensure that those persons undertaking the installation or removal of any such valve are aware of the designated classification and the requirements to ensure that appropriate records are made and retained, critical to this requirement is the designation of a unique valve number for M1, M2 and M3 valves (refer to Section 3.2 and Appendix F). The designer shall consult with Network Strategy for guidance as necessary (for GDSPs this will be via a CMAC Design Assurance Specialist)

Valve type	Approximate population (circa)	Maintenance frequency yrs.	Applicable procedure	V17 document reference
M1 SV (Strategic valve)	40	1 or 5 (valve type dependent)	T/PR/V/1701	Section 4.1
M1 OV (Operational valve)	3000			
M2	See T/SP/E/28		See T/PM/MAINT/2 – Part 2	Section 4.2
M3	3000	5	T/PR/V/1702	Section 4.3

*Class M1 – M3 Valve Summary Maintenance Chart*

### 2.1. Class M1 Valves

Class M1 valves are used in conjunction with Pressure Reduction Installations for the rapid isolation of wholly integrated networks in the event of either a national or local gas supply emergency.

Class M1 valves are sub categorized through the description and rationale identified as follows:

#### 2.1.1. M1 Strategic Valves (SV)

These valves have strategic importance in relation to the isolation of PRI's and in terms of isolating in totality large sections of the Distribution Network in the event of a major gas supply emergency thereby preventing any reintroduction of gas into integrated supply systems, and are determined through joint consultation between Network Strategy and Operations.



### 2.1.2. M1 Operational Valves (OV)

These valves are installed primarily to control and manage a local gas supply emergency, but are also available to support network isolations for major gas supply emergencies.

The Operational Valve population (OV) has been derived primarily from calculating a differential threshold value of 1 mbarg in line with industry recommendations for controlling a 7500m<sup>3</sup>/hr. flow rate. This philosophy equates to a diameter range of 12" and above for MP and IP mains. In addition the following valves are also classified as OV's (see Appendix B):

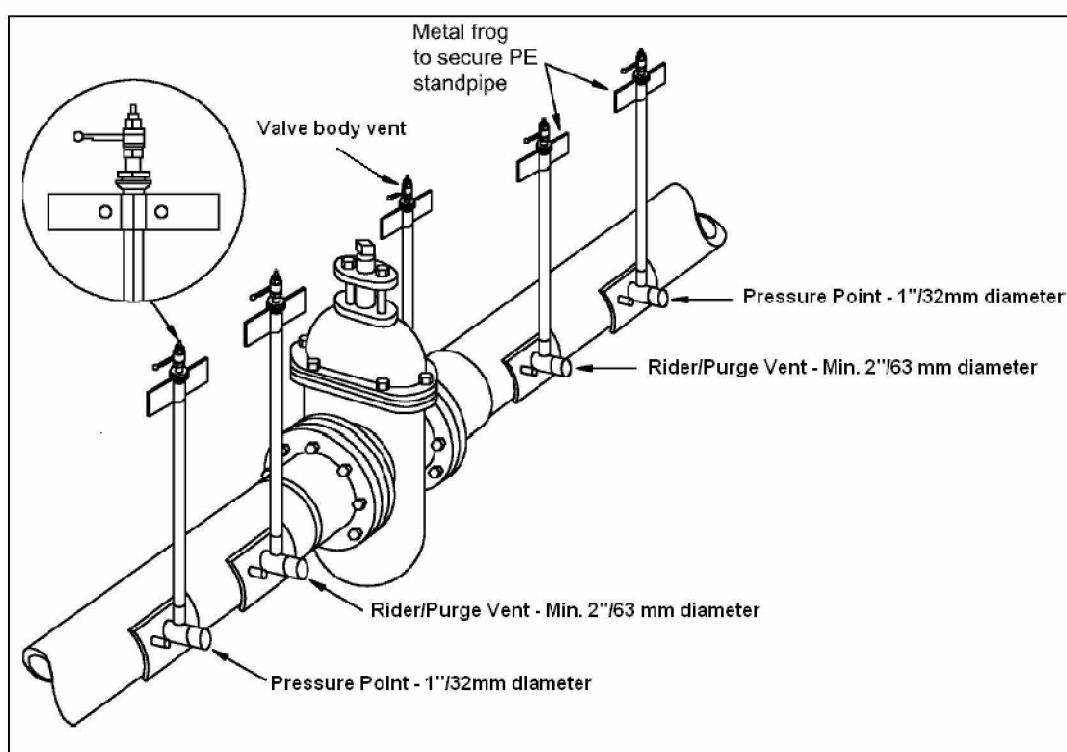
- 1) All line valves installed within IP mains
- 2) Any other valve designated to be a Class M1 Operational Valve (OV) nominated by an annual joint review between Operations and Network Integrity, the designer shall consult with Network Strategy for guidance as necessary (for GDSPs this will be via a CMAC Design Assurance Specialist).

This review will also assess any Class M1 valves no longer having any operational function, these shall be recorded in the 'Operational Status' field on a new valve card in line with the glossary definitions detailed in Appendix D with the asset data base updated accordingly.

### 2.1.3. New Class M1 valves

All new class M1 valves shall be of double block and bleed construction, be fitted with 1"/32mm diameter pressure points, 2"/63mm (minimum diameter) rider/purge vent points and be fitted with a body vent. These points shall be extended to surface boxes as shown in Figure 1 below. In rural or verge locations it is recommended that a concrete plinth surrounds the cluster for the purposes of safe access and maintenance. (Refer to figure 4 Appendix E)

Clear identification to the location of the valve will be through the provision of a marker post (e.g. lightweight M4 post) which shall clearly display the unique valve number allocated at the design stage along with relevant measurements as detailed in figure 5 Appendix E.



*Figure 1 - Typical new installation of a Class M1 Strategic Valve*

#### 2.1.4. Existing Class M1 valves

Where an existing valve is designated as an M1 valve, preference should be given to utilising a double block and bleed valve with an operable body vent where one exists. However, it is recognised that this will not always be possible, and single faced valves, or double block and bleed valves with inoperable body vents may be designated as M1 valves.

The body vent, (where fitted) and pressure points shall be extended to surface boxes, as shown in Figure 1 above.

- a) Where pressure points are not fitted either side of the valve they shall be installed; where they are extended into a common surface box, they shall be individually recorded. The valve and its associated pressure / rider points shall be clearly identified both physically by the use of marker posts / plates and through proper recording as per Section 3 of this document.in accordance with Appendix C – Valve Record Card



#### **T/PM/DR/23 - Management Procedure for Pipe Asset Record Update and Validation**

Where it is necessary to carry out excavation to fit pressure points to a valve that is of double block and bleed construction, a body vent shall be installed where one is not in place, where practical. The installation of rider points will be at the discretion of the Operational Manager.

**Note:** If during planned, emergency or maintenance activities it is determined that the valve is not to a Class M1 standard remedial action shall be undertaken or logged for follow up work to be completed within 12 months. Also see appendices G and H

## 2.2. Class M2 valves Pressure Reduction Installation Valves

Class M2 valves are installation isolation valves situated within the inlet and outlet mains/pipelines to the PRI in accordance with



**T/SP/E/28 – Specification for the design of Pressure Regulating Installations with Inlet Pressures not exceeding 100 bar**



**IGEM/TD/13 – Pressure Regulating Installations for Natural Gas, Liquefied Petroleum Gas and Liquefied Petroleum Gas/Air**

## 2.3. Class M3 Valves

Class M3 Valves are those that are operable without excavation and shall be available for local system isolation purposes, for example; contingency valves on NROs or for local isolation in the event of damage or other emergency situation. These are typically Medium Pressure line valves.

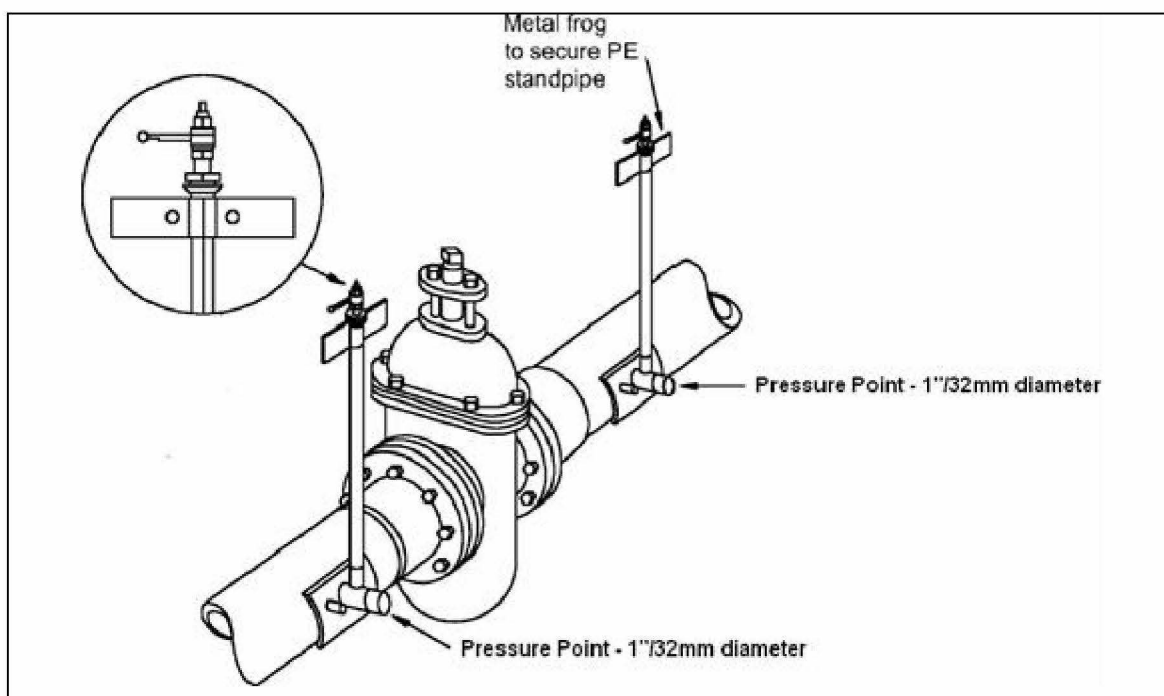
The following guidance is to assess the classification for designating a valve as a Class M3 Valve:

1. Line valves associated with a tee in a Medium Pressure system where the pipe is 8"/200mm diameter or greater.
2. A Medium Pressure line valve between any two PRI's supplying gas into the low pressure system where the inlet to the PRI is 8"/200mm diameter or greater.
3. Medium Pressure lines valves with the following spacing frequency:
  - i. Urban areas - typically maximum spacing should be 800 m
  - ii. Rural areas - typically maximum spacing should be 1500 m
4. Medium Pressure and large diameter (above 355mm/12") Low Pressure line valves situated on either side of major crossings e.g. rivers, railways etc. should normally be considered to be M3 valves.



5. A Medium Pressure line valve at the interface between PE and metallic pipes where there are no other nominated valves in close proximity to this interface.
6. Any line valve where the use of valves provides the only flow stop solution, e.g. 800mm, 630mm Medium Pressure/ Intermediate Pressure valves above 315mm – in such cases the distances between valves should be reduced from those stated above, taking account of supply demand scenarios.
7. Any line valve nominated by a joint review between Operations and Network Integrity
  - During the annual joint review specific attention shall be given to the current and future location of valves. Where there is a known risk of local flooding that could compromise the security of the gas supply network, liaison with local authorities to establish such risk areas shall be initiated ahead of the review discussions.
  - Special consideration to be given to valve locations situated adjacent to above ground crossings, refer to T/PM/MS/5 - Management Procedure for inspection and maintenance of exposed pipelines section and their supports on the <7 bar gas distribution network along with work procedure T/PR/APM/01 and T/PR/MS/6 requirements.

As a minimum these valves shall be provided with a pressure point either side of the valve to monitor pressures during any operation, refer to Figure 2 for a typical new M3 Valve installation.



*Figure 2 – Typical new installation of a M3 Valve installation*

*NB – minimum requirement – refer to figure 1 where circumstances allow*

#### 2.4. Construction valves

Construction valves should be installed solely to aid the process of connecting systems, e.g. under pressure tee connections. Where a construction valve is to be used as a M1, M2 or M3 valve, it shall be installed as indicated above, otherwise the valve shall be buried and its control mechanism shall not be accessible from the surface. Data capture of these assets remains in line with Section 3.

#### 2.5. Service Isolation Valves (SIV)

A service isolation valve (other than Emergency Control Valve - ECV) is used for controlling a supply of gas and is:

- i. incorporated in a service pipe
- ii. intended for use by a supplier or transporter of gas
- iii. not situated inside a property

These valves shall be installed remotely from the property and be located to allow safe operation in the event of an emergency within or adjacent to the property, SIV's are defined as:

1. Multi-occupancy buildings (Schools, Hospitals, High Rise)

For High Rise Buildings



Refer to –**IGEM/G/5 Edition 2 – Gas in multi-occupancy buildings** (see also section 2.6 below)

**NOTE:** an SIV is referred to as a PIV pipeline Isolation Valve within IGEM/G/5 Edition 2

2. Any low-pressure services of 63mm PE diameter and above
3. Places of public assembly (Cinemas, Public Houses, Shops, etc.)
4. Industrial processes and commercial properties
5. Wherever the property being supplied has the service entering below ground and terminating in a cellar
6. All Services supplying more than one primary meter\* in the same premises.

\* With the exception of a requirement of a site specific risk assessment external meters outside of the premises i.e. in meter boxes do not require an SIV

7. All Medium pressure (MP) services operating at pressures greater than 75 mbar where no \*\* Service Excess Flow Valve (SEFV) is fitted.

\*\* A Service Isolation Valve (SIV) is not required where a Service Excess Flow Valve (SEFV) is installed, for further detail.



Refer to –**T/PR/SL/1 – Section C4 - Work procedure for service laying up to and including 63mm diameter at pressure up to and including 2 bar**

## 2.6. Valves in Multi Occupancy Buildings (MOB)

### 2.6.1. Pipeline Isolation Valve (PIV)

Where a network pipeline supplies a multi-occupancy building (MOB) a PIV shall be installed outside the building to enable isolation of the building complex, sometimes referred to as a Service Isolation Valve.

It is a valve:

- i. That can be operated by a gas supplier or transporter of gas, however, resists efforts by persons who are not competent to restore gas supplies (such as building occupants or members of the public) to operate it with standard tools
- ii. shall be protected with a valve cover and be permanently identifiable
- iii. that shall be located:
  - a) near as practicable to the boundary of the property
  - b) Such that in the event of a building fire can be operated safely.
  - c) where vehicles are unlikely to stop or park

For additional guidance regarding the fitting or otherwise



Refer to – IGEM/G/5 Edition 2 – Gas in multi-occupancy buildings

### 2.6.2. Inlet Isolation Valve (IIV)

A Inlet Isolation Valve is a valve located near to the point of entry of a service to a multi storey building (riser main) to enable that part of the building to be isolated in the event of an emergency or for safety reasons, sometimes referred to a Riser Isolation Valve

It is a valve:

- i. incorporated in the service riser
- ii. intended for use by a gas supplier or transporter of gas or building occupant in event of an emergency
- iii. situated inside the building

For additional guidance regarding the fitting or otherwise





Refer to – IGEM/G/5 Edition 2 – Gas in multi-occupancy buildings

### 2.6.3. Branch Isolation Valve (BIV)

Where multiple network pipeline risers or major laterals are controlled by a common Inlet Isolation Valve, and in order to facilitate maintenance and or isolation a Branch Isolation Valve (BIV) should be located as near as practicable to the point where the branch is connected to the upstream pipe.

For additional guidance regarding the fitting or otherwise



Refer to – IGEM/G/5 Edition 2 – Gas in multi-occupancy buildings

### 2.6.4. Lateral Isolation Valve (LIV)

These valves should be installed on the laterals adjacent to the riser to facilitate maintenance and or isolation to the lateral and ECV supplying an individual property, sometimes referred to as Service Lateral Valves.

#### Note:

1. Inlet Isolation Valve (IIV) and Lateral Isolation Valve (LIV) are not always present, particularly on older installations.
2. Lateral Isolation Valve (LIV) can be located both inside and outside of the building.

For additional guidance regarding the fitting or otherwise



Refer to – IGEM/G/5 Edition 2 – Gas in multi-occupancy buildings

## 2.7. Emergency Control Valves (ECV)

An Emergency Control Valve is a valve for shutting off the supply of gas in an emergency, being a valve intended for use by a consumer of gas.

### 3. Valve identification and records

#### 3.1. Minimum record requirements for all new / existing (found) valves

All necessary valves shall be recorded in line with Gas Distribution Front Office systems (GDFO) via the SAP and ESRI platforms for subsequent interrogation by the business (including the Network Integrity Manager) details shall be data captured in accordance with



#### **T/PM/DR/23 – Management Procedure for Pipe Asset record Update and Validation**

The base data will generate subsequent maintenance schedules in accordance with the requirements of Section 4

In the event that a resurfaced over valve cover is located this should be identified in accordance with the management procedure



#### **T/PM/DR/4 Asset records error management for pipes and associated plant operating at 7 bar and below**

All new distribution valves and any existing distribution valves e.g. ECV above 2"/63mm diameter found during the course of operational works e.g. unearthed during excavation works or identified above ground being flanged and/or steel/PE pupped should have the following data recorded in line with the valve template (Appendix C) or electronic equivalent and glossary (Appendix D)

As a minimum the following information shall be captured and stored:-

1. Date Installed
2. Valve Serial Number (Manufacturers)
3. Address, Location e.g. Ordnance Survey map reference (Easting & Northing), or site address (governor/meter kiosk at A N Other factory, High St, Fleet or outside No.43 Portland Road, Fleet, in footpath, PRS at New Road, Aylesbury, etc.)
4. Network, e.g. East Anglia (1001), East Midlands (1002), North London (1003), North West (1004), West Midlands (1005)
5. Valve Diameter
6. Valve classification / criticality purpose/use, e.g. M1, M2, M3, construction valve, governor stream isolation valve, Service

Isolation Valve (SIV), Inlet Isolation Valve (IIV), Lateral Isolation Valve (LIV), Emergency Control Valve (ECV), etc.

7. Operating Pressure, e.g. LP, MP, or IP
8. Orientation, e.g. Above ground, Below ground, Partial, Vertical, Horizontal
9. Operation / Operational Status
10. Manufacturer

### 3.2. Additional requirements for M1, and M3 valves

M1 and M3 valves locations shall be selected either through a new design or re-designation of an existing valve in accordance with this procedure, in addition to 3.1 above and specific to Class M1 and M3 Valves the requirements as detailed below shall be undertaken, these align to the valve template (see Appendix C) and glossary (Appendix D):

1. The valve shall be issued with a unique valve number (see process chart in Appendix F)
2. Date installed
3. Ordnance Survey map reference, (Easting & Northing),
4. Dimensional sketch of the valve location including digital photograph(s) showing the completed installation in relation to adjacent geographic features for future location purposes.
5. Schematic line diagram showing how the valve (and associated pressure points) relates to other valves, mains etc. in its immediate vicinity.
6. Classification of valve (M1 or M3) (see appendix B)
7. Valve Position, Normally open or closed indication provided
8. Make and type of valve including flange details (e.g. AVK Ltd, Fig 555, NP16, etc.), material of construction (cast, ductile steel, PE, etc.) and whether single faced, double block and bleed or other construction (applicable for new valve installation).
9. Number of turns and direction of rotation to open or close
10. Details of body vent, pressure and rider points fitted

11. M1 and M3 valves shall be located with a marker plate – this shall indicate the diameter, valve number, pressure and distance and should be attached to either a marker post or wall. (see appendix E)
12. Valve covers/marker disc (See Appendix E – the valve cover should be marked either “G” or “GAS”. or alternatively a marker disc should be fitted over the valve spindle; this will have the word “GAS” indelibly marked on it.





### 3.3. Class M2 – Pressure reduction installation valves

Recording requirements for M2 valves will be in accordance with those retained for the Pressure Reduction Installations concerned and will include the manufacturer's valve serial number.

### 3.4. Additional Requirements for Service Isolation Valves

Whenever a Service Isolation Valve is installed, it shall be recorded on the B608 label (service information label) and attached to the service pipe adjacent to the emergency control valve. See Fig 3 below

nationalgrid		nationalgrid	
<b>WARNING - GAS AT PRESSURE</b>			
Maximum Operating Pressure <input type="checkbox"/> LP 75mbar <input type="checkbox"/> MP 2bar    IP/HP >2bar <input type="text"/> (bar/specify)			
For MP Meter Installations MP35 <input type="checkbox"/> MP45 <input type="checkbox"/> MP155 <input type="checkbox"/> MP160 <input type="checkbox"/> MP270 <input type="checkbox"/>			
Service Design Energy Value <input type="text"/> kW		OS TOLD No. <input type="text"/>	
Service Design Flow Rate <input type="text"/> M <sup>3</sup> /HR			
<b>Meter Point Reference Number (MPRN)</b> - NEW SERVICE: apply MPRN adhesive label - RELAY SERVICE: write allocated MPRN in boxes <div style="border: 1px solid black; width: 100px; height: 20px; margin-top: 5px;"></div>			
Installation Date <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>			
If Meter Bank give flat No. <input type="text"/>		Property No. House <input type="text"/> Plot <input type="text"/> Unit <input type="text"/>	
Syphon Fitted <input type="checkbox"/> Yes <input type="checkbox"/> No		Service Governor <input type="checkbox"/> Yes <input type="checkbox"/> No	
Diameter More than one may be ticked <input type="checkbox"/> 16mm <input type="checkbox"/> 20mm <input type="checkbox"/> 25mm <input type="checkbox"/> 32mm <input type="checkbox"/> 63mm <input type="checkbox"/> >63mm <input type="text"/> mm Specify		<div style="border: 2px solid red; padding: 2px;">Excess Flow Valve  <input type="checkbox"/> Yes    <input type="checkbox"/> No         </div>	
Material <input type="checkbox"/> ST <input type="checkbox"/> PE		<div style="border: 2px solid red; padding: 2px;">Service Isolation Valve  <input type="checkbox"/> Yes    <input type="checkbox"/> No         </div>	
Lay Method More than one may be ticked Meters: <input type="checkbox"/> Open Cut <input type="checkbox"/> Sidewalk <input type="checkbox"/> 24" <input type="checkbox"/> 18" <input type="checkbox"/> 10" <input type="checkbox"/> 11/2" <input type="checkbox"/> 3" <input type="checkbox"/> 1/2" <input type="checkbox"/> Test Replaced <input type="checkbox"/> Live Insert			
<b>DISCONNECTED SERVICE</b> <input type="checkbox"/> Service Lateral Valve <input type="checkbox"/> Service Isolation Valve <input type="checkbox"/> Full Disconnection <input type="checkbox"/> House Entry Tee			
<small>National Grid is a trading name for National Grid Gas plc (Registered Office: 1-3 Strand London WC2N 5EH)          Registered in England and Wales No. 2006500</small>			



<b>GAS EMERGENCY CONTROL VALVE</b>	
<b>IF YOU THINK YOU CAN SMELL GAS</b>	
Turn off the supply at the control valve. Open doors and windows. Do NOT use naked flames. Do NOT turn electric switches on or off. Do NOT smoke.	
<b>IMMEDIATELY CONTACT THE GAS EMERGENCY SERVICE USING TELEPHONE NUMBER</b> <div style="background-color: black; width: 100px; height: 20px; margin: 5px 0;"></div>	
Do not reopen the supply until remedial action has been taken by a competent person to prevent gas escaping again. <b>DO NOT USE THIS SERVICE AS AN EARTH</b>	
Typical Control Valve Operation	
ON  OFF	ON  OFF
<b>DO NOT REMOVE THIS LABEL</b>	

Figure 3 – Service laying label (B608)

## 4. Routine maintenance of valves (see Appendix H)

### 4.1. Class M1 valves

These valves shall be maintained at a five yearly interval in accordance with work procedure



**T/PR/V/1701 – Work procedure for the maintenance of class M1 valves**

Except for the following types of valves which shall be maintained as follows:

- Audco plug (Serck) valves and Cameron Ball valves shall be maintained annually

#### Note

- Ball valves or plug valves that are power-operated and
- Block valve sites

Should follow the maintenance frequencies and be maintained as stated in



**T/PM/MAINT/5 –Management procedure for maintenance of pipelines operating above 7 Barg**

### 4.2. Class M2, Pressure Reduction Installation valves

The maintenance requirements are described in



**T/PM/MAINT/2 – Part 2 - Management Procedure for Maintenance of Pressure Regulating Installations Part 2 - Installations with Inlet Pressures at 7bar and Below (Excluding Service Regulator Installations supplying less than 10 customers)**

Specific guidance to the requirements for the routine check are detailed in



**T/PR/MAINT/2202 –Work Procedure for Functional Check of Pressure Regulating Installations With Inlet Pressure Of 7 Bar And Below**

### 4.3. Class M3 valves

All Class M3 Valves shall be inspected at a five yearly interval in accordance with work procedure



**T/PR/V/1702 –Work Procedure for the maintenance of Class M3 valves**

Additionally all Class M3 Valves which are plug / ball valves that are power-operated should follow the maintenance frequencies stated in



**T/PM/MAINT/5 –Management Procedure for  
maintenance of pipelines operating above 7 Barg**

**4.4. Valve Maintenance / Inspection through the NRO process (See Appendix G)**

When planning for a Non - Routine Operation (NRO) the Authorising Engineer (AE) shall determine that any contingency valves are physically located and accessible.

In carrying out these checks it may be appropriate to follow the full requirements of T/PR/V/1701 (M1) or T/PR/V/1702 (M3) in which case the process flow in Appendix G should be followed to ensure the valve maintenance schedules are updated accordingly.

**Note:**

Additionally, where applicable, data shall be verified against existing data held within NG repository systems.

**4.5. Failure of Valve Mechanical Fasteners on AVK (555) Donkin valves**

Following the significant loss of containment as a result of failures of mechanical fasteners leading to a detachment of a Fig 555 valve bonnet from the valve plate, an ongoing remedial programme for Fig 555 valves has resulted.

Please refer to



**T/PR/V/18 Work Procedure for Working on, or near to,  
MK3 Fig 555 Wedge Gate Valves**

**4.6. Construction valves, SIVs, valves in MOB and ECVs**

There is no requirement to maintain these valves.

**4.7. Change in valve designation or redundant valves**

Where an existing live valve is no longer designated as a Class M1, M2 or M3 valve and not required for future operational use, but remains live, the record shall be amended accordingly, retention of the valve data shall be maintained.



Where a valve on a pipeline is abandoned and classified as redundant the surface boxes and where applicable the marker post shall be removed and records updated accordingly.

## 5. Associated Construction Requirements

### 5.1. Valve / Rider / Pressure Point Covers

Suitable valve covers are selected in accordance with:

- Location
- Vehicle loading
- Access requirements
- Potential for vandalism

### 5.2. Cover Base and Section Construction

It is important when building a valve sectional pit that due consideration is given to both the structural stability of the ground foundation and interface with the parent main. This not only protects the buried gas asset but also the integrity and future maintenance of the associated cover. If this is not properly considered the public could be at risk of either a trip or vehicular hazard

A bridge to support subsequent loadings transferred via the valve sections should be constructed over the main to avoid damaging the associated pipeline / valve

The size / pressure of the main and access may determine that a full structural design is required; design and construction approvals may be required in accordance with T/PM/G17 requirements. Pits shall comply with



**T/SP/CE/1 Specification for the Design, Construction and Testing of Civil and Structural Works**

## 6. Periodic review of M1 valve population by Ops/Network Strategy

To ensure the existing M1 valve populations are fit for purpose both Operations and Network Strategy will carry out a periodic review on a four year rolling basis based on undertaking a review of these valves in each of the four NGG Distribution Networks

Network	Allocated year
North West	Year 1
West Midlands	Year 2
East of England	Year 3
North London	Year 4

The review will take into the account but not be limited to the following:

- The appropriateness of the existing M1 strategic valve (SV) installations to successfully enable rapid isolation of wholly integrated thereby preventing any reintroduction of gas into integrated supply system networks in the event of a gas supply emergency (See 2.1.1).
- The appropriateness of the nominated Class M1 Operational valves (OV's) to manage sub networks for large gas supply emergencies e.g. third party damage, and an in line with industry recommendations for controlling (7500<sup>3</sup>m/hr. flow rate see 2.1.2)
- The installation or removal of any new line valve on the IP network and whether such valves have been correctly classified to be a Class M1 valve (Operational Valve (OV) or Strategic Valves (SV)
- Above Ground Crossings and 'at risk areas' of flooding should be included as part of the appropriateness of the locations of the Class M1 Valve population
- The findings or lessons learnt from a National gas supply emergency operation where M1 valves have been used to isolate parts of the Network or any other gas supply emergency where lessons have been identified for wider dissemination.



## Appendix A – Change record and key changes

Document background	Date	Reference
Published as Valve policy up to and including 7 Bar	July 1997	
Revised and re-issued as T/PM/V/17	May 2006	EPSEG/T05/1584
Revised and re-issued as T/PM/V/17 Note: 1) Maintenance requirements for M1 valves has been placed in a separate Work Procedures - T/PR/V/1701 2) M2 valve maintenance is captured under T/PM/MAINT/2 Part 2 and Part 3. 3) The inspections of M3 valves is captured by T/PR/V/1702	March 2013	
Revised and re-issued as T/PM/V/17	June 2016	

## Key changes

Reference	Amendments
Scope of application	Wording reiterates equipment within Pressure Reduction Installations (PRI) and holder stations whilst being numerically referenced are not covered by the provisions of the document
References	Additional references included, location of section moved to rear of document (see Appendix J related documents)
Classification	Specific references to Appendix B Flow chart for the classification of valves and Appendix F to the designation of valve numbers (where appropriate) at the front end of the process under the responsibility of the designer or proposer ensuring proper data capture
2.1 Class M1	Class M1 Valves have the requirement that they are used in conjunction with Pressure Reduction Installations for the rapid isolation of wholly integrated networks in the event of either a national or local gas supply emergency
2.1.1 - M1 Strategic Valves (SV)	<p><u>M1 Strategic Valves (SV) :</u></p> <p><i>These valves have strategic importance in terms of isolating in totality large sections of the Distribution Network in the event of a major gas supply emergency thereby preventing any reintroduction of gas into integrated supply systems</i></p> <p>They are determined through joint consultation between Network Strategy and Operations</p>

2.1.2 – M1 Operational Valves (OV)	<p><u>M1 Operational Valves (OV):</u>  <i>These valves are installed primarily to control and manage a local supply emergency but are also able to support network isolations for major gas supply emergencies.</i></p> <p>The population is driven from calculating a differential threshold in line with industry standard to control a 7500 m<sup>3</sup>/hr. flow rate, this equates to a diameter range of 12" and above, the previous demand threshold (&gt;25,000 scmh) proved un- manageable in terms of network analysis modelling.</p> <p>Reference to an M1 valve for an On- site Emergency Plan for a gas holder installation has been removed as a result of the demolition programme.</p>
2.1.3 – New Class M1 Valves	<p>Emphasis added to the requirement to allocate a Unique Number to new M1 valves at the design stage and incorporate within a marker post / plate in a satisfactory position for the purposes of safe access / maintenance.</p>
2.1.4 – Existing Class M1 valves	<p>Specific reference added to the M1 valve identification both in terms of site visibility and for recording relevant data via a common template.</p> <p>Requirement added to ensure correct remedial activities are logged during planned and or emergency activities</p>
2.2 Class M2, Pressure Reduction Installation valves	<p>Grammatical change to wording only</p>
2.3 Class M3 Valves	<p>The classification definitions have been numbered and align to the flow chart in Appendix B.</p> <p>Additional detail added to bullet 6 including 800mm pipe diameter for reducing spacing frequencies.</p> <p>New considerations added to the allocation of M3 status to valves for above ground crossings and areas of known or potential to flood areas, cross referencing to new procedures T/PM/MS/5, T/PR/APM/01 and T/PM/MS/6.</p>
2.4 Construction Valves	<p>Emphasis of the importance of data capture of these valves even if buried.</p>

2.5 Service Isolation Valves	<p>Introductory paragraph now includes narrative to the location for safe access in the event of an emergency.</p> <p>The classification definitions have been numbered and align to the flow chart in Appendix B.</p> <p>Reference made to IGEM/G/5 Edition 2 – Gas in multi-occupancy buildings for (MOBs bullet 1)</p> <p>Clarity given to requirements for SIV's and meter boxes if more than 1 primary meter (bullet 6)</p>
2.6 Valves in Multi Occupancy Buildings	<p>Updated terminology for MOB valves as referenced within IGEM/G/5 Edition 2 – Gas in multi-occupancy buildings now included for:</p> <ul style="list-style-type: none"> <li>• Inlet Isolation Valves (IIV)</li> <li>• Branch Isolation Valves (BIV)</li> <li>• Lateral Isolation Valves (LIV)</li> </ul>
3.1 Minimum record requirements for all new / existing (found) valves	<p>Slight wording change in introductory statement and inclusion of existing / (found) valves.</p> <p>Additional wording to reference procedures for data capture of valve attributes in GDFO systems i.e. T/PM/DR4 and T/PM/DR/23 added.</p> <p>Narrative linked to a common valve data template and glossary of associated terminology added to drive consistency in data capture for Ops, GDSP's, UIPs and IGT's.</p> <p>The classification glossary definitions have been numbered and link to the valve template for the capture of 'all available' valve data. (refer to Appendices C&amp;D)</p>
3.2 Additional requirements for M1 and M3 valves	<p>Introductory paragraph now includes the selection criteria being through a 'new design or re-designation' and states a 'shall' list for critical capture of data specifically required for M1 and M3 valves in addition to those detailed in 3.1.</p> <p>Incorporated into the listing is section 4.2 of the previous version T/PM/V/17 for which the detail is also included in the valve template.</p>
3.4 Additional Requirements for Service Isolation Valves	<p>Fig 3 – Service laying label (B608) added</p>

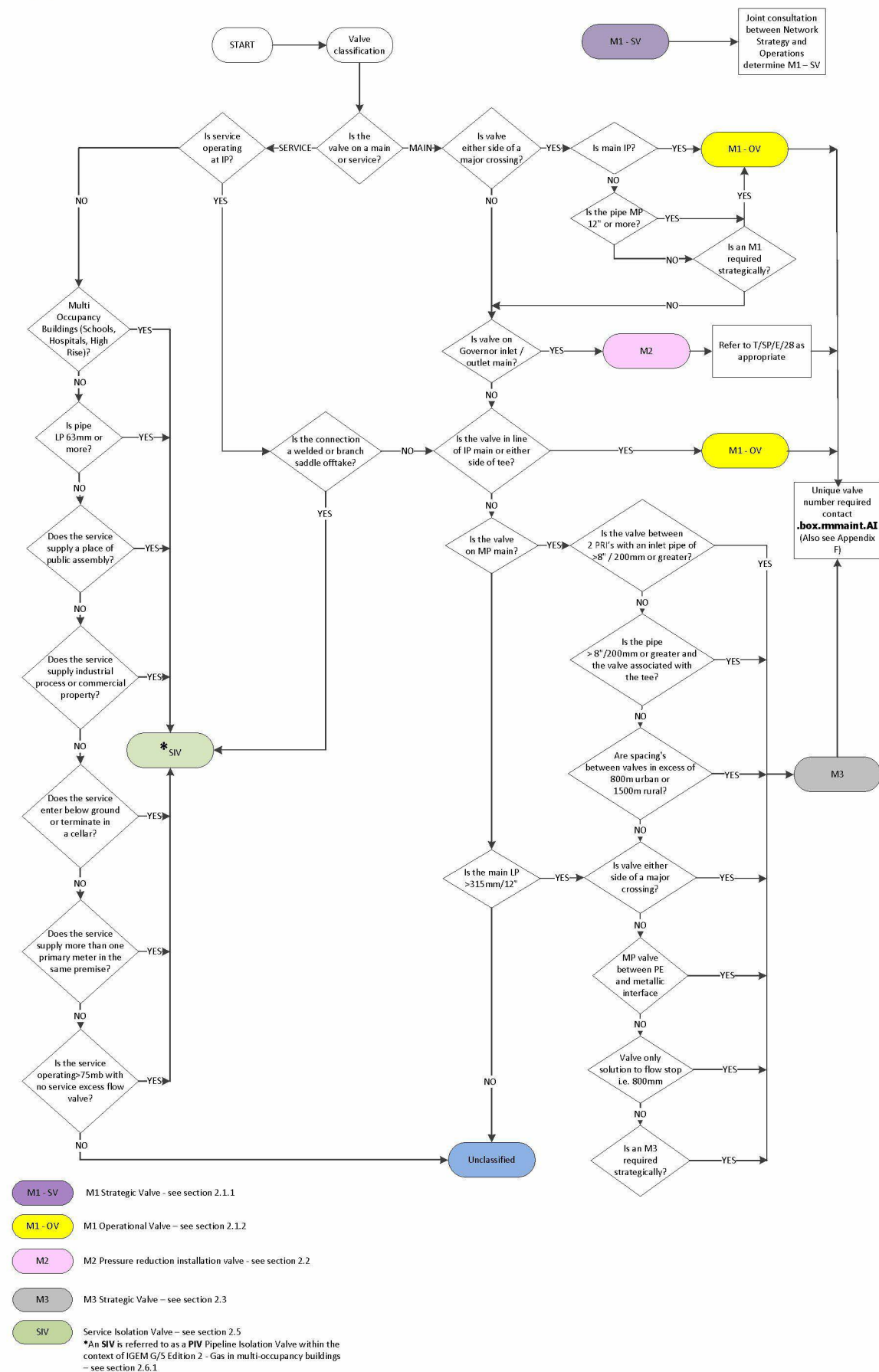


4.1 Routine Maintenance of valves 4.2 Class M1 valves	Block Valve sites added to note that references maintenance frequencies to T/PM/MAINT/5 – Management procedure for maintenance of pipelines operating above 7 Barg
4.2 Class M2, Pressure Reduction Installation valves	Reference to T/PR/MAINT/2202 –Work Procedure for Functional Check of Pressure Regulating Installations With Inlet Pressure Of 7 Bar And Below added.
4.4 Valve Maintenance / Inspection through the NRO process	When planning for a Non - Routine Operation (NRO) the Authorising Engineer (AE) shall determine that any contingency valves are physically located and accessible.  In carrying out these checks it may be appropriate to follow the full requirements of T/PR/V/1701 (M1) or T/PR/V/1702 (M3) in which case the process flow in Appendix G should be followed to ensure the valve maintenance schedules are updated.
4.5 Failure of Valve Mechanical Fasteners on AVK (555) Donkin valves	New section added to cover T/PR/V/18 Work Procedure for Working on, or near to, MK3 Fig 555 Wedge Gate Valves
4.7 Change in valve designation or redundant valves	Underlined statement added - <i>Where a valve on a pipeline is abandoned the surface boxes and where applicable the marker post shall be removed <u>and records updated accordingly</u></i>
5. Associated Construction Requirements  5.1 Valve / Rider / Pressure Point Covers 5.2 Cover Base and Section Construction	New Sections added to reinforce structural design and safety implications when locating and constructing a valve that could lead to member of the public slips, trips and falls. (It is the intention to develop a work procedure with additional detail for valve construction to enhance that currently detailed in: - T/PM/MSL/1 - National Grid Management Procedure for Main Laying and Service Laying
7.0 Periodic review of M1 valve population by Ops/Network Strategy	Additional new M1 two tier classification narrative added to update this section.  In addition 'Above Ground Crossings and 'at risk areas' of flooding should be included as part of the appropriateness of the locations of the Class M1 Valve population' added.
Appendix A – Change List of references	Updated with changes since March 2013 version
Appendix B – Valve classification flowchart	Flow Chart for use in determining the valve classification and applying for a Unique Valve Number (where applicable) at the design stage.
Appendix C – Valve record card	A template identifying all valve attributes to be recorded in accordance with this procedure, (could be used as an electronic equivalent)



Appendix D – Valve glossary card	A glossary of terms to define valve attributes and provide guidance in populating the valve template or ESRI / SAP platforms
Appendix E – Typical Marker / Cover and Valve Cluster detail	General cluster valve arrangements including marker post details
Appendix F – Valve numbering process	Flow chart for use in applying for an M1 or M3 Unique valve number
Appendix G – Valve inspection/ maintenance through the NRO process	Flow chart depicting process steps for carrying out NRO contingency validation work including recording valve data and remedial maintenance requirements
Appendix H – Valve maintenance/Inspection summary	Flow chart depicting process steps for carrying out Valve maintenance / Inspection process requirements



## Appendix B – Valve classification flowchart



## Appendix C – Valve record card

Valve Installation - Data Capture		nationalgrid
1	Project Reference No.	<input type="text"/>
2	Engineers Name	<input type="text"/>
3	Date Installed	<input type="text"/>
4	EUS No	<input type="text"/>
5	Unique Valve No	<input type="text"/>
6	Valve Serial No	<input type="text"/>
7	Address: Street	<input type="text"/>
	Town / City	<input type="text"/>
8	Location	<input type="text"/>
9	Eastings	<input type="text"/>
10	Northings	<input type="text"/>
11	Network	<input type="text"/>
Site Photographs		Please take photographs of valve location to provide an indication of the location in relation to background geography
		
		Comments <input type="text"/>
12	Sketch	<div></div>
Valve Asset Details		
13	Valve Diameter	<input type="text"/>
14	Classification	<input type="text"/>
15	Operating Pressure	<input type="text"/>
16	Orientation	<input type="text"/>
		Comments <input type="text"/>
17	Valve Position	<input type="text"/>
18	Operational Status	<input type="text"/>
19	Manufacturer	<input type="text"/>
		Comments <input type="text"/>
20	Type of Valve	<input type="text"/>
		Comments <input type="text"/>
21	Valve Material	<input type="text"/>
22	Flange Detail	<input type="text"/>
23	Double Block & Bleed	<input type="text"/>
24	Direction To Close	<input type="text"/>
25	No. of turns to close	<input type="text"/>
26	Pressure Points fitted	<input type="text"/>
27	Rider Points fitted	<input type="text"/>
28	Rider Point Size	<input type="text"/>
29	Body Vent Fitted	<input type="text"/>
30	Valve Cover / Marker	<input type="text"/>
31	Marker Plate Present	<input type="text"/>
32	Was BA worn during	<input type="text"/>

Version 14.3

Save and Submit Survey

## Appendix D – Valve glossary card

ID No	Valve Card Glossary		System Definitions	
	Valve Card Requirement	Definition	ESRI (Definition) Input Options	SAP (Definition) Input Options
1	Project Ref	Project Number allocated to the approved project. (Scheme No)	No field within ESRI to document project ref	No field within SAP to document project ref
2	Engineers Name	Team Leader Responsible for commissioning or decommissioning the associated pipeline	No field within ESRI to document project ref	No field within SAP to document project ref
3	Date Installed	Calendar Date	Numeric date field XX/XX/XXXX	Numeric date field XX/XX/XXXX
4	EUS Number	Engineering Utility Scheme No	Free Text Field	Include in Comments Field
5	Unique Valve No.	Numeric Reference Number allocated by ADI	Equipment ID Free Text Field	Equipment ID Free Text Field (assigned as next number recorded in spreadsheet)
6	Valve Serial No.	Unique Serial Number assigned to the valve by the manufacturer, the valve is normally tagged	Free Text Field	Free Text Field
7	Address	Address at which the valve is located	X/Y Co-ordinates	X/Y Co-ordinates
8	Location	Physical Location of valve <ul style="list-style-type: none"> <li>• Field</li> <li>• Verge</li> <li>• Footpath</li> <li>• Road</li> </ul>	No input required	No input required
9	Easting's	Grid Ref (X/Y)	Free Text Field	Grid Ref (X/Y)
10	Northing's	Grid Ref (X/Y)	Free Text Field	Grid Ref (X/Y)
11	Network	Network Area for which the valve is located.	Drop Down Box <ul style="list-style-type: none"> <li>• 1001 - EA</li> <li>• 1002 - EM</li> <li>• 1003 - NL</li> <li>• 1004 - NW</li> <li>• 1005 - WM</li> </ul>	Owned by

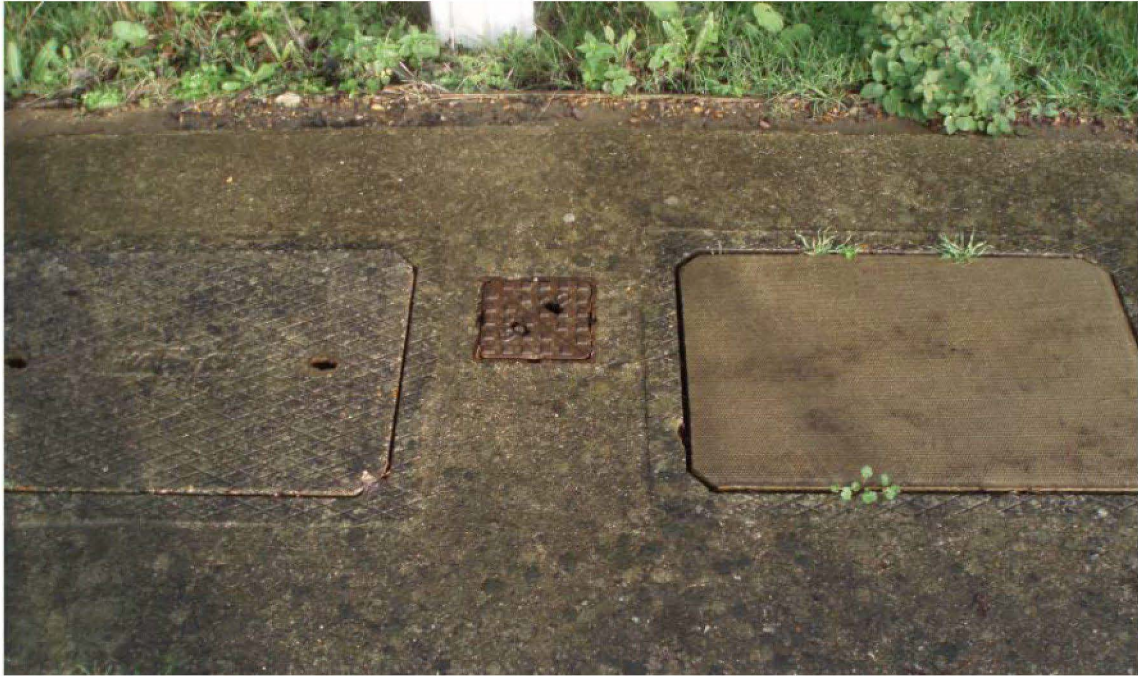
12	Sketch	This could be freehand in the box or an appended drawing i.e. from Data Capture Technician's As Laid Record or Sketch	Digitise record where applicable	Confirm Included on Card - no capture requirements in SAP
13	Valve Diameter	Valve nominal Diameter	Free Text Field	Free Text Field
14	Classification (Criticality Rating) – See flow chart	Valve Purpose as defined in Policy T/PM/V/17	Drop Down Box <ul style="list-style-type: none"> <li>• M1</li> <li>• M2</li> <li>• M3</li> <li>• S1 (service isolation valve)</li> <li>• Riser Isolation Valve</li> <li>• Service Lateral Valve</li> <li>• Emergency Control (ECV)</li> <li>• Construction Valve</li> </ul>	Valve Classification <ul style="list-style-type: none"> <li>• M1</li> <li>• M2</li> <li>• M3</li> <li>• S1 (service isolation valve)</li> <li>• Riser Isolation Valve</li> <li>• Service Lateral Valve</li> <li>• Emergency Control (ECV)</li> <li>• Construction Valve</li> </ul>
15	Operating Pressure	Low Pressure (<75mb) Medium Pressure (>75mb- <2bar) Intermediate Pressure (>2bar -<7bar)	Drop Down Box (Pressure Tier UK) <ul style="list-style-type: none"> <li>• LP (&lt;75mbar)</li> <li>• MP (&gt;75mb- &lt;2bar)</li> <li>• IP (&gt;2bar -&lt;7bar)</li> </ul>	Pressure Category <ul style="list-style-type: none"> <li>• LP (&lt;75mbar)</li> <li>• MP (&gt;75mb- &lt;2bar)</li> <li>• IP (&gt;2bar -&lt;7bar)</li> </ul>
16	Orientation	Location of where the valve can be found (Additional comments box to capture any environmental factors i.e. submerged, angled or combination of input fields)	Drop Down Box <ul style="list-style-type: none"> <li>Above ground</li> <li>Below ground</li> <li>Partial</li> <li>Vertical</li> <li>Horizontal</li> </ul>	Drop Down Box <ul style="list-style-type: none"> <li>Above ground</li> <li>Below ground</li> <li>Partial</li> <li>Vertical</li> <li>Horizontal</li> </ul>
17	Valve Position	Details of whether the valve is open or closed.	Drop Down Box (Normal position) <ul style="list-style-type: none"> <li>• Open</li> <li>• Closed</li> </ul>	Valve Normally <ul style="list-style-type: none"> <li>• Open</li> <li>• Closed</li> </ul>

18	Operation / Operational Status	Status of the valve	Operation Status <ul style="list-style-type: none"> <li>Asset under construction</li> <li>Commissioned</li> <li>Decommissioned</li> <li>Installed not commissioned</li> <li>Isolated</li> <li>Planned</li> <li>Planned abandoned</li> <li>Warning uncertain status</li> <li>Disposed</li> </ul>	Operation Status <ul style="list-style-type: none"> <li>Asset under construction</li> <li>Commissioned</li> <li>Decommissioned</li> <li>Installed not commissioned</li> <li>Isolated</li> <li>Planned</li> <li>Planned abandoned</li> <li>Warning uncertain status</li> <li>Disposed</li> </ul>
19	Manufacturer	Name of manufacturer of the Valve (Additional comments box to capture any Manufacturer not listed)	Drop Down: Various Manufacturer names	Drop Down: Various Manufacturer names
20	Type of Valve	Type of Valve (Additional comments box to capture Make / Model Number as necessary i.e.555)	Drop Down Box: <ul style="list-style-type: none"> <li>Butterfly Valve</li> <li>Gate Valve</li> <li>Ball Valve</li> <li>Plug Valve</li> <li>Slide Valve</li> <li>Needle Valve</li> <li>Unknown</li> </ul>	Drop Down Box: <ul style="list-style-type: none"> <li>Butterfly Valve</li> <li>Gate Valve</li> <li>Ball Valve</li> <li>Plug Valve</li> <li>Slide Valve</li> <li>Needle Valve</li> <li>Unknown</li> </ul>
21	Valve Material	i.e. CI / Steel / PE	Free Text	Free Text
22	Flange Details	Flange Detail	Drop Down Box (multiple selection Inc.'s SAP fields): Flange Joint Type <ul style="list-style-type: none"> <li>Flanged</li> <li>Flanged/Welded</li> <li>Flat</li> <li>Raised</li> <li>Ring</li> <li>Screwed</li> </ul>	Drop Down Box (multiple selection Inc.'s SAP fields): Flange Joint Type <ul style="list-style-type: none"> <li>Flanged</li> <li>Flanged/Welded</li> <li>Flat</li> <li>Raised</li> <li>Ring</li> <li>Screwed</li> </ul>
23	Double Block and Bleed Valve	Double Block and Bleed facility on valve	Drop Down Box: <ul style="list-style-type: none"> <li>Yes</li> <li>No</li> </ul>	Not required



24	Direction to close	Details of which direction you have to turn the valve to close (clockwise or anti-clockwise)	Drop Down Box <ul style="list-style-type: none"> <li>clockwise enter (cw)</li> <li>anticlockwise enter (acw)</li> </ul>	Direction to Close: <ul style="list-style-type: none"> <li>Clockwise</li> <li>Anticlockwise</li> </ul>
25	No. of turns to close	For number of turns to close (record for new valve installation or during M1 maintenance only see T/PR/V/1701)	For number of turns i.e. 15 input in free text	For number of turns i.e. 15 input in free text
26	Pressure Points fitted (either side of valve)	Pressure Points fitted either side of valve	Drop Down Box: <ul style="list-style-type: none"> <li>Yes</li> <li>No</li> </ul>	Pressure Points Both Sides: <ul style="list-style-type: none"> <li>Yes</li> <li>No</li> </ul>
27	Rider Points fitted (either side of valve)	Rider Points fitted either side of valve	Free Text Field	Rider Points Both Sides: <ul style="list-style-type: none"> <li>Yes</li> <li>No</li> </ul>
28	Rider Point Size	Size of Rider Points fitted either side of valve	Free Text Field <ul style="list-style-type: none"> <li>Bypass Point size mm</li> </ul>	<ul style="list-style-type: none"> <li>1" or 32mm</li> <li>2" or 63mm</li> </ul>
29	Body Vent Fitted	Body Vent fitted to the Block and Bleed facility from the body of the valve (if available)	Drop Down Box: <ul style="list-style-type: none"> <li>Yes</li> <li>No</li> </ul>	Body Vent to surface: <ul style="list-style-type: none"> <li>Yes</li> <li>No</li> </ul>
30	Valve Cover	Confirmation that a marked valve cover (G or GAS) or a marker disc (marked Gas) is attached to the valve spindle	Valve Box tagged, Drop Down Box: <ul style="list-style-type: none"> <li>Yes</li> <li>No</li> </ul>	Valve cover marked gas: <ul style="list-style-type: none"> <li>Yes</li> <li>No</li> </ul>
31	Marker Plate Present	Details of whether there is a marker plate present – indicating location of valve (yes or no).	Valve marker present Drop Down Box: <ul style="list-style-type: none"> <li>Yes</li> <li>No</li> </ul>	Valve Marker plate: <ul style="list-style-type: none"> <li>Yes</li> <li>No</li> </ul>
32	Was Breathing Apparatus worn during the course of this operation	Details of whether the engineer completing the work had to wear breathing apparatus during the operation SAP entry only.	Not required	Not required

## Appendix E – Typical Marker / Cover and Valve Cluster detail



*Figure 4 - Typical Valve Concrete Plinth*



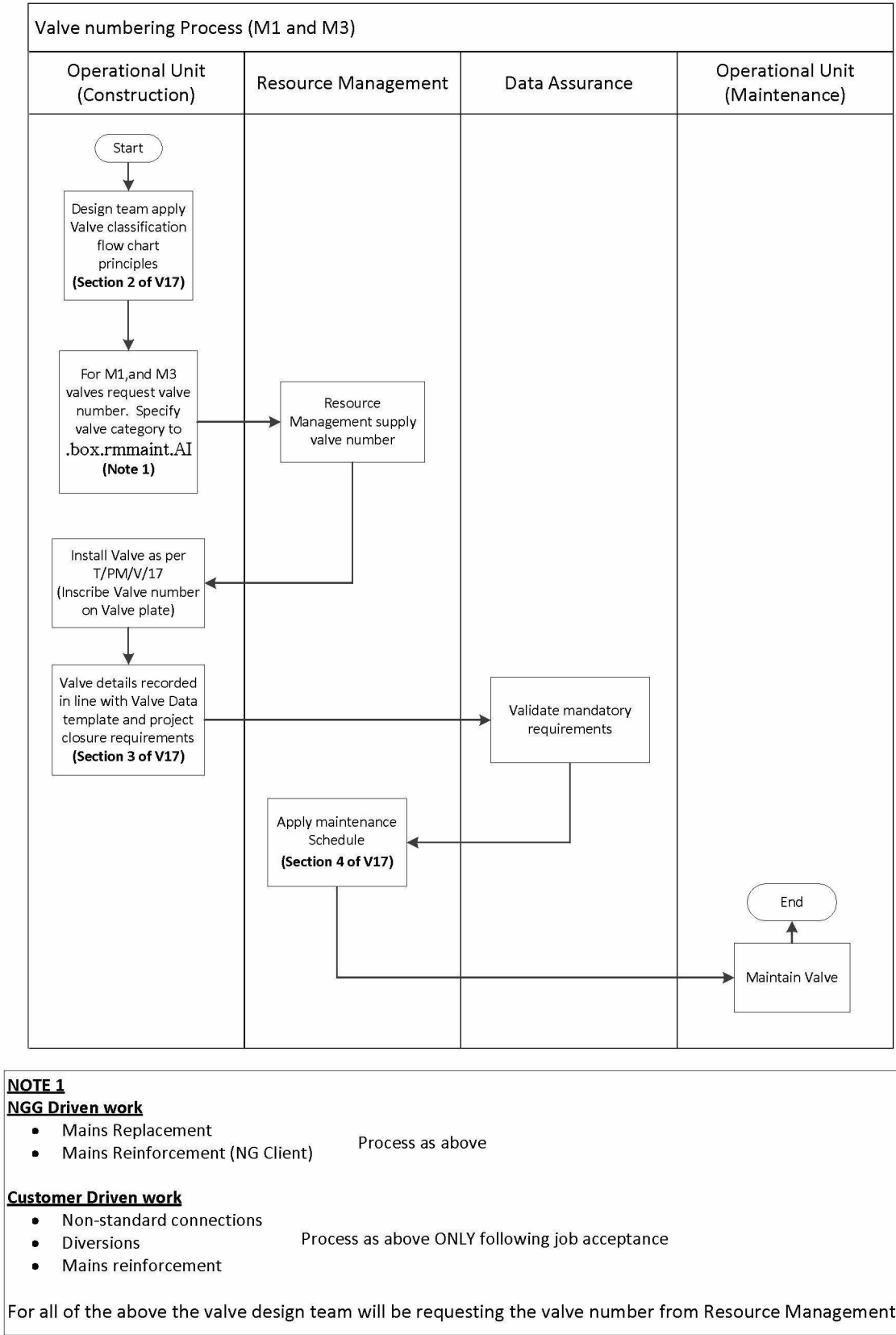
*Figure 5 Typical Marker Post Arrangements*





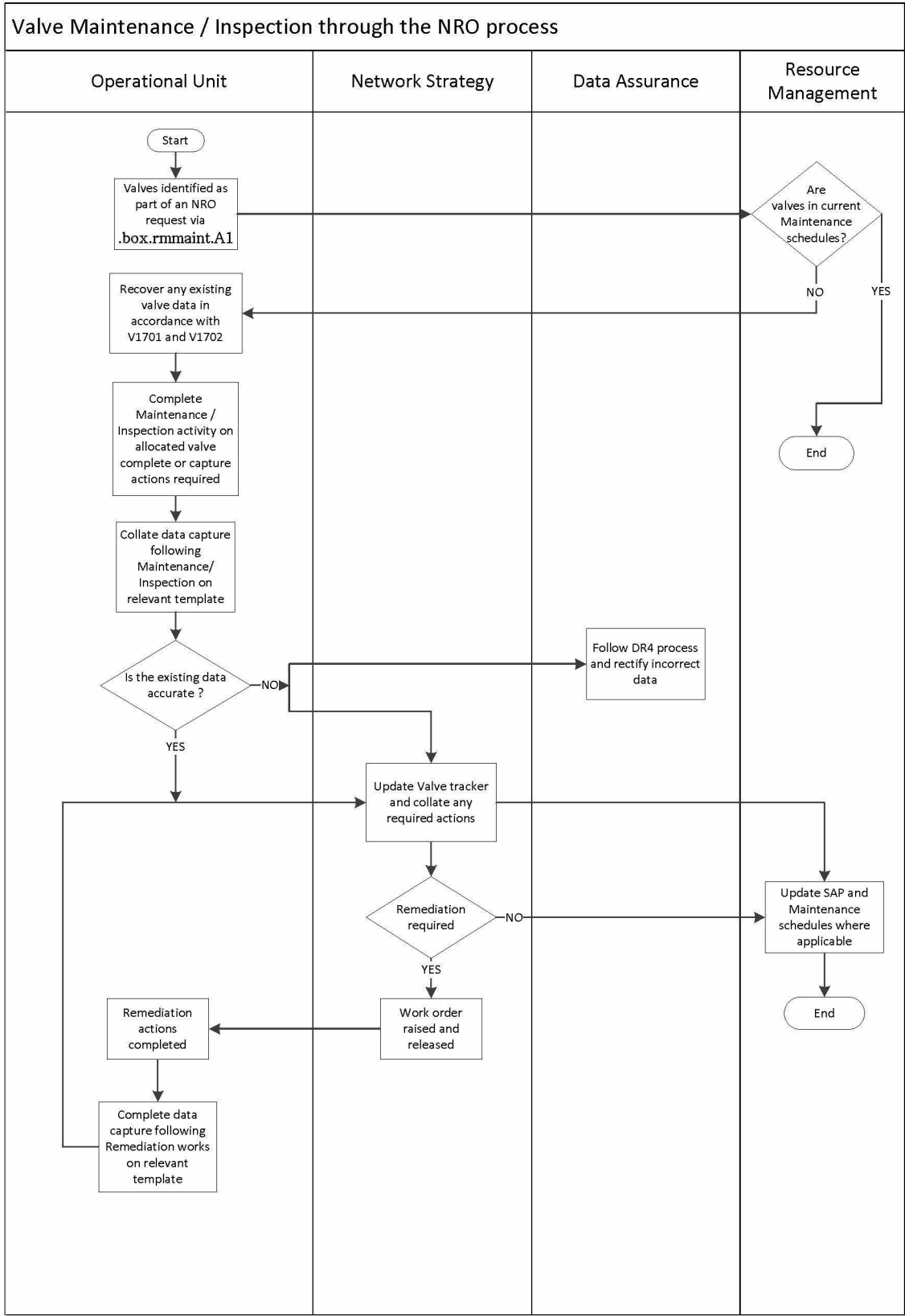
*Figure 6 Valve Covers*

Appendix F – Valve numbering process (M1 and M3)

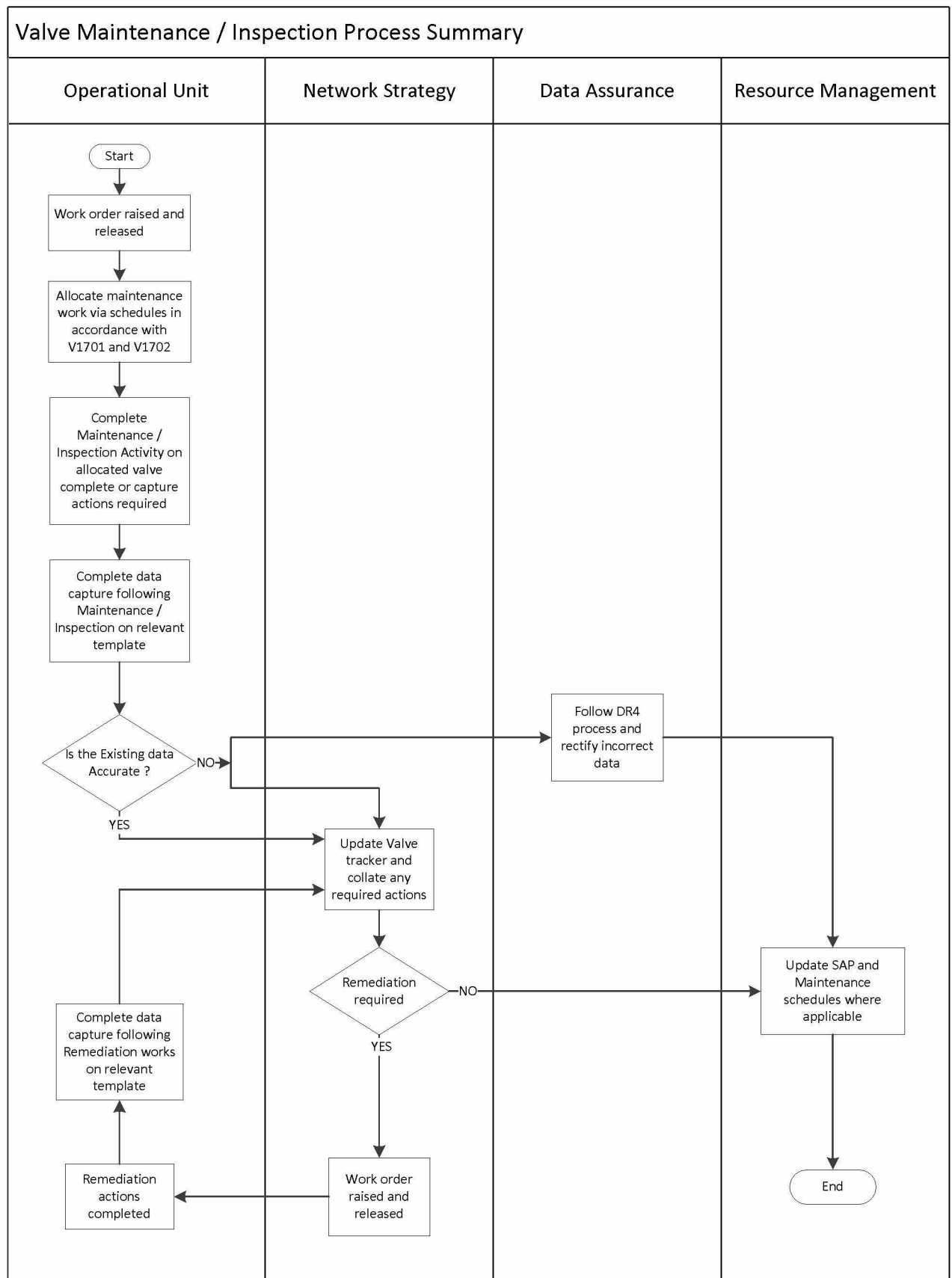




Appendix G - Valve inspection/maintenance through the NRO process



## Appendix H – Valve Maintenance / Inspection process summary



## Appendix I – Glossary of terms

Term	Description
BIV	Branch Isolation Valves should be located as near as practicable to the point where the branch is connected to the upstream (Multiple Occupancy Buildings MOBs) pipe
Competent Person	Network Supervisor (NG/GDSP) Data Capture Technician (GDSP DCT)
Construction valves	Should be installed solely to aid the process of connecting systems
ECV	Emergency Control Valve a valve for shutting off the supply of gas in an emergency
First Line Manager	Design Engineers (NG/GDSP) Authorising Engineer Network Engineer Design Assurance Specialist
IIV	Inlet Isolation Valve sometimes referred to as a Riser Isolation Valve, (Multiple Occupancy Buildings MOBs)
LIV	Lateral Isolation Valves should be installed on the laterals adjacent to the riser, sometimes referred to as Service Lateral Valves.
OV	Operational Valve
PIV	Pipeline Isolation Valve (Multiple Occupancy Buildings MOBs)
PRI	Pressure Reduction Installation Valve
Senior Manager	Operations Network Manager Engineering Manager CMAC Local Responsible Manager (GDSP)
SIV	Service Isolation Valves
SV	Strategic Valve
Team Leader	Team Leaders (NG/GDSP)

## Appendix J - Related documents

Reference	Title
T/PM/DR/23	Management Procedure for Pipe Asset Record Update and Validation
T/PM/DR/4	Asset records error management for pipes and associated plant operating at 7 bar and below
T/PM/MAINT/1	Management Procedure for the Maintenance of Pipelines at pressures up to and including 7 Barg
T/PM/MAINT/2 Part 2	Management Procedure for Maintenance of Pressure Regulating Installations Part 2 - Installations with Inlet Pressures at 7bar and Below (Excluding Service Regulator Installations supplying less than 10 customers)
T/PM/MAINT/2 Part 3	Management Procedure for Maintenance of Pressure Regulating Installations Part 3 – Installations with Inlet Pressures above 7Bar
T/PM/MAINT/5	Management Procedure for Maintenance of Pipelines Operating above 7 Barg
T/PR/V/1701	Work Procedure for the Maintenance of Class M1 Valves
T/PR/V/1702	Work Procedure for the Maintenance of Class M3 Valves
T/SP/E/28	Specification for the Design of Pressure Regulating Installations with Inlet Pressures Not Exceeding 100 Bar
T/PR/V/18	Work Procedure for Working on, or near to, MK3 Fig 555 Wedge Gate Valves
T/PM/IGEM/TD/13	Management Procedure for the application of IGE/TD/13 Institution of Gas Engineers and Managers – Pressure Regulating Installations for Transmission and Distribution Systems
T/PR/MAINT/2202	Work Procedure For Functional Check Of Pressure Regulating Installations With Inlet Pressure Of 7 Bar And Below
T/PM/MS/5	Management Procedure for inspection and maintenance of exposed pipelines section and their supports on the <7 bar gas distribution network
T/PR/MS/6	Work procedure for inspection and maintenance of exposed pipelines section and their supports on the <7bar gas distribution network
T/PR/APM/01	Work Procedure for Inspection of Access Prevention Measures for Exposed Pipeline Sections
T/PM/G/17	Management Procedure For The Management Of New Works, Modifications and Repairs
T/SP/CE/1	Specification for the Design, Construction and Testing of Civil and Structural Works



## End note

### Comments

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

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National Grid House

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