Asset Health Engineering Justification Framework

Governors

Legal Notice

This paper forms part of Wales & West Utilities Limited Regulatory Business Plan. Your attention is specifically drawn to the legal notice relating to the whole of the Business Plan, set out on page 3 of Document 1 of WWU Business Plan Submission. This is applicable in full to this paper, as though set out in full here

Contents

1 Summary Table

Name of Project	Asset Health – Governors		
Scheme Reference	WWU.25		
Primary Investment Driver	Asset Health		
Project Initiation Year	2026		
Project Close Out Year	2031		
Total Installed Cost Estimate (£)			
Cost Estimate Accuracy (%)	+/-15% based on significant experience of delivering this work and detailed work and cost records.		
Project Spend to date (£)			
Current Project Stage Gate	Not started		
Reporting Table Ref	Table 5.04		
Outputs included in RIIO-GD3 Business Plan	Outputs will be in the BPDT, Table Ref. 5.04		
Spend apportionment 23/24 prices	G2	G3	G4
	-		-

The apportionment should detail the spend for the project over multiple price controls, if applicable. G3 would represent the request for this submission.

2 Executive Summary

District and Industrial & Commercial (I&C) Governors have inlet gas pressures of up to 7bar and serve as the interfaces between pipe networks of various operating pressures. They, regulate pressure from one tier to another to be suitable for use by a range of end users, including large industrial and commercial consumers, as well as domestic households and small businesses. A range of supporting assets, including telemetry and pressure profile control systems are an integral part of the function of this asset group to provide early warning of failure and improved pressure control.

Some consumers connected to pipes operating at pressure not suitable to enter their meter will have a Service Governor at their property. This reduces the pressure from the distribution pipe to a safe and suitable pressure to enter their service and pass through their gas meter.

The purpose of this investment in our District, I&C and Service Governors is to manage asset health, ensuring their continued integrity, operation and compliance with WWU's Safety Case, as well as to meet stakeholders' requirements that we maintain risk and reliability in a financially efficient manner.

Our preferred option for these assets, our Balanced Plan, combines planned maintenance and refurbishment to maximise asset lives and planned replacement when it is no longer viable to continue to operate. This option provides lowest whole life cost for consumers. It balances short-term operational necessities with strategic, long-term goals, ensuring the network's resilience and compliance with legislative standards.

The Net Present Value (NPV) relative to baseline of our Balanced Plan option is:

- [redacted] for District and I&C Governors
- [redacted] for Service Governors

This demonstrates long term value for todays and tomorrow's bill payers.

Failure to undertake this work will result in an increased risk of not satisfying the requirements of legislation, or non-compliance with the WWU Safety Case and may result in a failure to deliver stakeholder outputs, or enforcement action by the Health & Safety Executive.

Table 1 - Cost & Volume Table, RIIO-GD2 to RIIO-GD3

	RIIO-GD2		RIIO-GD3	
	Cost (£m)	Volume (No.)	Cost (£m)	Volume (No.)
Inspection	[redacted]	140	[redacted]	436
Refurbishment		1,075		1,025
Replace Component		448		520
Replace Fence		77		75
Replace Housing		248		225
Replace Entire Installation		460		458
Total		**2,448**		**2,739**

3 Introduction

This document aims to provide a comprehensive overview of distribution network pressure regulating installations known collectively as Governors. It will highlight key information related to these asset groups and examine the likelihood and consequences of failures. Following this, it will explore various intervention strategies along with their associated costs, culminating in our recommended investment option for Governors during RIIO-GD3.

Figure 1 - Example of Governor Installation

Gas enters the Wales & West Utilities' (WWU) Local Transmission System (LTS) from the National Transmission System (NTS) at 17 Offtake sites across our network. The LTS transports gas through a network of high-pressure pipelines and pressure reduction installations until it enters the below 7bar distribution networks. These are made up of distribution pipelines, as well as integrated distribution networks operating at three distinct pressure tiers: Intermediate Pressure (2-7bar); Medium Pressure (75mbar – 2bar); and Low Pressure (below 75mbar). District Governors have inlet gas pressures of up to 7bar and serve as the interfaces between these pressure tiers, reducing pressure accordingly from one tier to another to be suitable for use by a range of end users, including large industrial and commercial consumers, as well as domestic households and small businesses. A range of supporting assets, including distribution telemetry and profile control systems are an integral part of the function of this asset group.

Customers are connected at all three pressure tiers, either directly to a distribution pipe which feeds their gas meter, or in some cases to a Service Governor, which reduces the pressure from the distribution pipe to a suitable pressure to feed their service and gas meter.

We have established efficient procedures to manage the risks associated with these assets; without these measures, we would fail to meet key stakeholder requirements and adhere to our legal obligations.

Each maintenance and inspection visit is an opportunity for our Operatives to raise any issues or observations through our fault reporting processes. These fault records, and results of other routine activities, feed into our risk models, ensuring that we are making decisions based on recent accurate records and data.

The proposed level of investment has been set to maintain the current risk outputs and compliance with the relevant legislation.

4 Equipment Summary

The diagram below, Figure 2 depicts the role of governors within the gas distribution network, Figure 3 illustrates the geographic location of these sites:

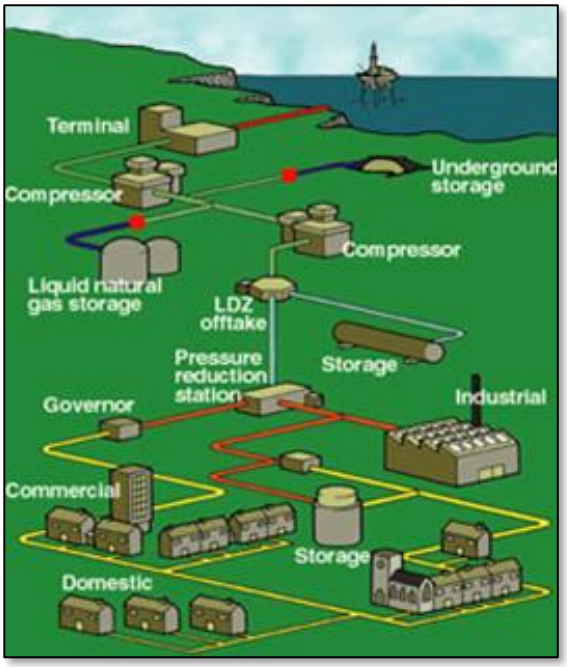

Figure 2 - Role of Governors in the Network

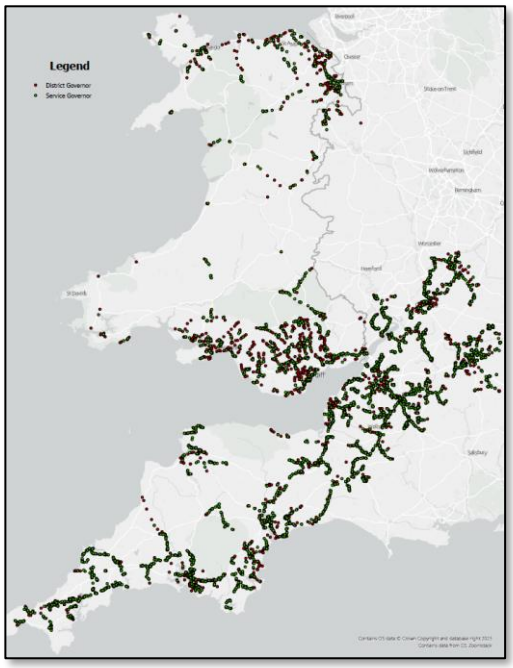

Figure 3 - District and Service Governor population across the network

There are three classifications of Governors: District Governors (DG), Industrial & Commercial Governors (I&C) and Service Governors (SG), and the descriptions and asset populations of each can be seen in the tables below

Table 2 - Summary of Governors by Type (Forecast as of Year 1, RIIO-GD3)

	District Governor (DG)	Industrial & Commercial (I&C) Governor	Service Governor (SG)
Purpose	Supply multiple properties of different types	Supply larger industrial and commercial properties	Generally, supply up to 10 domestic properties or 1 or 2 smaller commercial properties
Population	2,396	1,265	13,770
Customers Supplied	<100 to ~52,000	1 to ~200	1 to 10
Typical Location	On the outskirts of, or inside, towns	Business parks/factories	Less densely populated areas

Table 3 – Summary of DG and I&C Governors by Pressure Cut (Forecast as of Year 1, RIIO-GD3)

Pressure Cut vs. Type	District Governor (DG)	Industrial & Commercial (I&C) Governor	Total
IP-IP	12	6	18
IP-MP	172	64	236
IP-LP	316	98	414
MP-MP	5	74	79
MP-LP	1,891	1,023	2,914
Total	**2,396**	**1,265**	**3,661**

Larger district or industrial & commercial governors contain a number of components, see Figure 4 and Table 4 below:

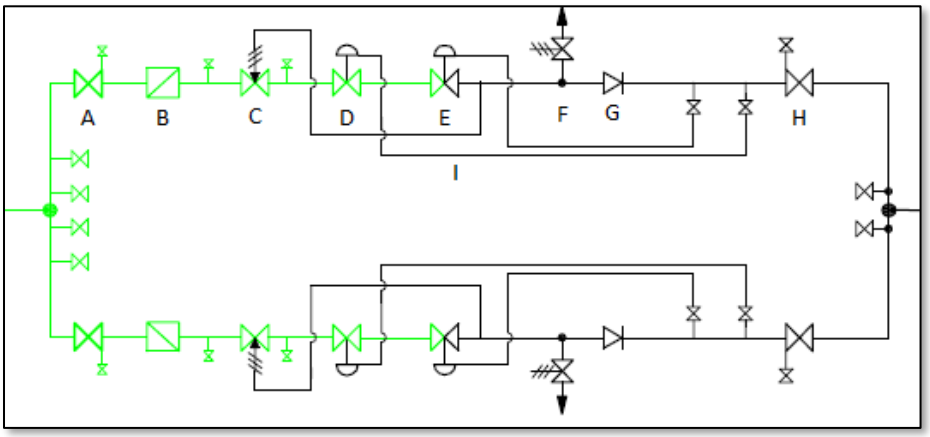

Figure 4 - Governor Schematic

Table 4 - Component Summary

ID	Component	Description
A	Inlet Valve	Inlet isolation in the event of maintenance or emergency
B	Filter	Capture any debris that has entered the distribution system
C	Slam Shut Valve	Protects downstream system from over-pressurisation
D	Monitor Regulator	Control in the event of an active regulator failure
E	Active Regulator	Control the pressure reduction of gas
F	Creep Relief	Stops network from over-pressuring in low demand
G	Non-Return Valve	Limit gas flowing upstream following pressure increases
H	Outlet Valve	Isolate the outlet in the event of maintenance or emergency
I	Auxiliary Control	Provides finer control of regulators

The schematic in Figure 4 shows a typical twin-stream arrangement. There is a working stream, through which gas flows under normal operating conditions, and a standby stream, which activates when the working stream fails to maintain the downstream pressure at a pre-determined pressure set point. The twin stream arrangement also allows for one stream to be isolated for routine maintenance, whilst the other continues to supply downstream consumers. See Figure 1 in the Introduction for an example of a twin-stream governor installation.

Service governors have similar equipment on them, but they are much smaller in size. They are often single stream, limiting refurbishment options and whole life costs assessment leads us to run these assets to end of life then replace.

Approximately 1,100 district governors have sophisticated pressure management equipment and software, known as profile control, installed on them to optimise the network pressures delivered to downstream consumers. This keeps the network pressures as low as possible, to minimise methane emissions due to leakage, whilst ensuring adequate pressure is provided to end consumers for their appliances to function safely and efficiently. These systems have played a significant part in reducing methane emissions, enabling outperformance of challenging emissions reduction targets.

Reference should be made to the E&I Engineering Justification Paper for the costs, volumes and justification for intervening on these assets.

As the energy transition towards net-zero progresses, WWU has a vital role to play, ensuring that our network remains fit for today and the future net-zero ambitions. WWU have 21 existing biomethane connections connected across the portfolio with plans to connect more. Integration of these assets onto legacy networks provides complexities, especially in low demand periods when it is difficult to maintain high flow rates of biomethane into the network. Our control systems need to evolve to improve this.

Minimising pressures to minimise emissions remains a goal, but the control systems also need to now offset pressures to give biomethane sites the best opportunity to act as the main feed into

networks when competing with other methane feeds. We lead a successful innovation project to evolve pressure control, seeking to achieve both methane emission reductions and also maximising green gas injection.

In RIIO-GD3 WWU plan to deploy the more sophisticated control systems across key networks, upgrading control sites and installing extremity monitoring points on these networks, with the aim of providing the above functionality. Providing carbon displacement of nearly 1600 tonnes of CO_2 per year. Locations depend on new biomethane connections and the technology is in its infancy so we intend to fund under Use It Or Lose It (UIOLI). As such, funding requests for deploying this innovation are not in scope of this EJP.

5 Problem/ Opportunity Statement

The purpose of this investment in our Governors assets is to ensure their continued integrity and compliance with WWU's Safety Case, as well as to meet stakeholders' requirements that we maintain risk and reliability in a financially efficient manner.

As part of annual programmes of maintenance and intervention, each visit is an opportunity for our Operatives to raise any issues or observations through our long-established fault reporting processes. These fault records, and the results of other routine activities, feed into our decision-making processes, ensuring that we are making decisions based on recent, accurate records and data.

We also carry out sample audits on completed works and we conduct post-investment appraisals. The learning points inform future investment decisions and improve remediation techniques and when taken with the aforementioned processes, provide an appropriate level of assurance.

The proposed level of investment has been set to maintain the current risk outputs and compliance with the relevant legislation.

The work covered by this EJP is made up of planned proactive interventions, non-routine maintenance and reactive interventions to resolve faults identified during maintenance activities. This work will also ensure that these assets remain fit for purpose and maintain compliance with the following Regulations:

- The Pressure Systems Safety Regulations 2000
- The Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR)
- The Gas Safety (Management) Regulations 1996

It should be noted that many of our large governor sites were installed in the 1980s, and are approaching end of life, whereby refurbishments are no longer suitable to extend the working life of the site. Therefore, whilst refurbishment is always the first choice when assessing intervention needs, there are a subset of sites for which replacement is the only feasible option to achieve continued reliability for downstream end users and manage safety risk to the immediate area.

Obsolescence is also becoming a significant challenge in managing these assets. Given the age of these installations, a lot of the existing portfolio of components are no longer supported by the original manufacturers. The obsolescence status of each site is included in the justification for the intervention option chosen to resolve the integrity issues on site.

Failure to undertake this work will result in an increased risk of not satisfying the requirements of the legislation; or non-compliance with the WWU Safety Case and may result in a failure to deliver stakeholder outputs; or enforcement action by the Health & Safety Executive. In addition, these installations may suffer an increasing fault rate due to advanced deterioration, incurring additional costs and in extreme cases an interruption of supplies.

The outcome we want to achieve is the continued safe transportation, distribution and storage of gas and to deliver a safe and reliable supply of gas to the public, commercial establishments, and industry. In carrying out its undertaking, WWU protects the safety of its employees and the community, and safeguards the environment from the effects of accidents, incidents and pollution. As a minimum, WWU must always comply with all relevant legislative, regulatory and statutory obligations.

We will measure success through several performance indicators including:

- Customer interruption numbers
- Monetised risk levels (NARM)
- Fault and failure rates

5.1 Narrative Real-Life Example of Problem

There are several locations on a governor that are susceptible to early degradation and where there is a need to be able to easily inspect the equipment to confirm condition. When we undertake a refurbishment, these areas are generally targeted to reduce the risk of early degradation and improve access for future inspection and maintenance.

The following section provides some real-life examples of these problems. Each example will give an overview of the work required, before and after photos, and total spend.

Wellmans Club, Llangefni – Full Replacement Service Governor

Site ID	WWU-WA-MN-555089
Project ID	9534
Completion Year	2023
Total Cost	[redacted]

This Service Governor was surveyed during an IP pipe route walk carried out as part of our RIIO-GD1 plan to improve our IP/MP Service Governor data. Our engineer reported that the governor was in poor condition and raised a fault to undertake wholesale replacement of the unit. This recommendation was reviewed by our Asset Managers an, balancing risk and cost, approved the decision to replace.

Figure 5– Wellmans Club, Llangefni, before replacement

Figure 6 – Wellmans Club, Llangefni, after replacement

Winchcombe Hospital – Housing Replacement

Site ID	WWU-SW-MN-167559
Project ID	17374
Completion Year	2022
Total Cost	[redacted]

This I&C Governor was scoped for a new kiosk because the roof was found to be leaking, causing deterioration of the governor rig enclosed within. The doors had warped and as a result and were unable to be opened or closed/locked securely. The original kiosk also had less than 500mm walkaround and low head height.

Due to these factors the decision was taken to install a new kiosk.

Figure 7 - Winchcombe Hospital District Governor, before new kiosk

Figure 8 - Winchcombe Hospital District Governor, after new kiosk

Rhyd Y Blew, IP-MP & IP-LP – Full Replacement District Governor

Site ID	WWU-WA-MN-623004
Project ID	10111
Completion Year	2021
Total Cost	[redacted]

This District Governor was scoped for wholesale replacement, including kiosk and replacement of the leaking inlet pipe. This decision was supported by whole life costs analysis and engineers' views that refurbishment was not a practical option and would not offer a significant life extension.

Figure 9 - Rhyd Y Blew IP-MP & IP-LP, before replacement

Figure 10 - Rhyd Y Blew IP-MP & IP-LP, after replacement

5.2 Project Boundaries

The spend boundaries associated with this asset group can be seen below:

- **Wholesale Replacement** - replacement of the entire governor rig (all above ground pipework and key components), concrete base and housing. This may involve the relocation of Governor if is deemed to be in a vulnerable location)
- **New Install Growth** – The existing governor is now under capacity because an area has taken on new consumer loads.
- **Refurbishment** - preparing the rig by removing existing coatings and surface corrosion and applying multiple layers of new protective coating. If appropriate, parts in poor condition will also be replaced.
- **Housing Replacement** – installing a new kiosk where the exiting is no longer fit for purpose.
- **Fencing Replacement or Installation** - fitting palisade fencing around the site perimeter to reduce the likelihood of vandalism, road traffic accidents, theft and fly tipping. Where existing fences (which can be wooden stock fences) are in poor condition, they are replaced with metal palisade fencing.
- **Install Physical Protection** - reducing the risk of asset damage from a road traffic collision.
- **Additional Site Telemetry** - Installing alarms fed back to a central control room for early warning of a potential failure of a site.

6 Probability of Failure

Failure modes and probabilities of failure have been agreed, assessed and documented as part of the cross-GDN process to develop NARM's models. This was done through a number of cross-GDN workshops with asset experts and through careful analysis of available data held by companies to assess and quantify the rates of failures and future asset deterioration.

Figure 11 is an illustration of the process to monetise risk. It shows the relationship between the asset (left) and the total monetised risk value (right), taking into account the failure modes, the probabilities of failure, the consequences of failure and the costs of these consequences occurring.

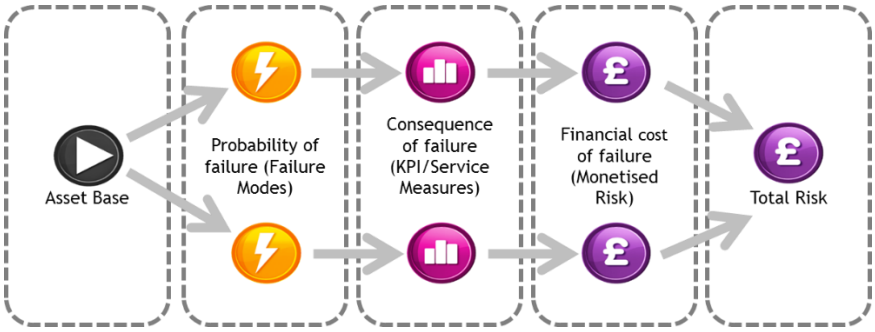

Figure 11 - Illustrative Example: Asset to Total Monetised Risk

The failure modes for these assets include:

- **Capacity Failure** - where the Governor is under-sized to meet downstream demand
- **Failure Closed** - where a regulator fault has been assessed to result in a failure in the closed mode which halts flow from the site
- **Failure Open** - where a regulator fault has been assessed to result in a failure in the open mode which results in over-pressuring the downstream network
- **Interference Failure** - for example 3rd party damage or vandalism
- **Corrosion Failure** - corrosion of the internal pipework. Corrosion of components assessed to result in a Failure Open or Failure Closed are considered within these risk nodes
- **Governor Emissions** - background leakage or shrinkage from the Governor
- **Control System Failure** - failure of the telemetry or associated electrical / instrumentation systems and profilers

The predicted failure rates of the equipment are derived from WWU historical data and experience from the wider pipeline operator industry, in particular for high consequence, low probability events, where pooling data is necessary due to limited volume of these events.

6.1 Probability of Failure Data Assurance

Fault and failure data is collected when a defect is identified during routine or reactive inspection This data is recorded through our robust fault reporting process into our core asset repository, SAP. This process allows us to attribute faults and failures against individual components and provides a full record of integrity issues identified over time across WWU's Governor asset base. All faults and condition reports are investigated, and plans put in place to address the issues found, to restore or maintain integrity. These fault records and results of other routine activities feed into our health and risk models, ensuring that we are making decisions based on recent accurate records and data.

7 Consequence of Failure

The primary role of our governor assets is to regulate gas pressure through the distribution network. The consequences of failure are:

- **Gas Escape** - that could result in increased public reported escapes (PRE's), a negative impact on environment from methane lost to atmosphere, and explosion
- **Loss of Control** - this results in a sub-optimum pressure leaving the station, but is not severe enough to result in a supply interruption
- **Loss of Gas** - arising from failure of the Governor station itself
- **Downstream Over-Pressurisation** - leading to damage and/or loss of containment, this could cause significant damage to the downstream pipe network and consumers' meters resulting in supply interruptions and gas entering a building with the associated risk of explosion
- **Supply Interruption (SI)** - to customers in the network downstream of the Governor station
- **Explosion** - either at the Governor itself or in the downstream network

Consequence values are dependent on the consequences being assessed, and some of these consequences are inter-related.

These consequences are forecast using previous experiences across the UK gas network through assessment of pooled data from all GDNs, as well as spatial analysis through GIS systems and network modelling to determine downstream customers. More detail can be found in the published GDN monetised risk methodology.

8 Options Considered

This section details the options considered for managing our Governor population, following on from the Problem/Opportunity Statement set out in Section 5, and the probability of failure and consequences of failure, set out in Sections 6 & 7, respectively.

8.1 Baseline Option Summary: Reactive Only

This option focuses on ensuring compliance with existing legislative requirements through the implementation of basic repair and refurbishment activities, as necessary. The nature of the actions taken is generally reactive, responding to issues as they arise rather than through pre-planned interventions, implementing temporary and/or short-life fixes.

Unlike a proactive, long-term approach, this reactive option focuses on immediate compliance and minimal intervention, prioritising repairs based on legislative urgency and operational necessity. Generally, this option enables quick response times to critical issues while deferring less urgent repairs to align with budgetary constraints.

Table 5 - Benefits & Disbenefits of Baseline Option

Benefits	Description
Cost	Lowest initial cost option, maintaining and repairing only

Disbenefits	Description
Reliability	Lack of redundancy (multi-feed), decommissioning sites that can't be repaired
Safety	Require Operatives to work on increasingly dangerous assets
Environment	Increased leakage occurrences, leading to higher methane emissions
Cost	Increased maintenance activities to manage deteriorating network
Cost	Cost of repairs will be increasingly expensive (mobilising multiple times, etc.)
Cost	Deferring significant works to future years, therefore more involved / expensive
WLC	Higher Whole Life Cost compared to proactive management approaches
Health / Risk	Health deteriorating, risk increasing, not what our stakeholders want from us
Reputation	Increasing reputational damage from incidents, increased public scrutiny
Regulator	Enhanced monitoring from HSE, leading to increasing scrutiny

Delivery Timescales: 2026 - 2031

8.2 1st Option Summary: Refurbishment Only

This option focuses on addressing and rectifying issues only when they arise rather than through routine or preventive maintenance. This approach is often adopted in cases where the operational environment is predictable, and the impact of failure is minimal or manageable. The strategy

assumes that the impact of failures, should they occur, will not have severe repercussions on safety, environmental compliance, or financial stability. It also assumes that repair / refurbishment is possible, and if it isn't the asset will be decommissioned.

This method also relies heavily on the quick availability of skilled personnel and resources for unplanned repairs. In critical environments, a purely repair-based approach may not be suitable; however, in non-critical, low-risk scenarios, it can be a viable and cost-efficient solution.

Table 6 - Benefits & Disbenefits of Option 1

Benefits	Description
Cost	Lower initial cost option, maintaining & repairing only, to remain compliant
Reliability	Assets are repaired / refurbished when performance / condition indicates need

Disbenefits	Description
Reliability	Lack of redundancy (multi-feed), decommissioning sites that can't be repaired
Safety	Require Operatives to work on increasingly dangerous assets
Environment	Increased leakage occurrences, leading to increased gas emissions
Cost	Increased maintenance activities to manage deteriorating network
Cost	Deferring significant works to future years, therefore more involved / expensive
Health / Risk	Population health deteriorating, risk increasing, not what our stakeholders want
Regulator	Enhanced monitoring from HSE, leading to increasing scrutiny

Delivery Timescales: 2026 - 2031

8.3 2nd Option Summary: Balanced Plan

This balanced plan option strategically integrates both reactive work and wholesale replacement activities, ensuring that it meets legislative requirements while optimising time, money, and resource allocation. By adopting a hybrid approach, the programme aims to provide a pragmatic solution that prioritises urgent repairs without neglecting the long-term sustainability of the network.

The balanced approach combines the flexibility of reactive maintenance with the reliability of planned replacement. This option offers the best of both worlds: the agility to address urgent issues promptly and the foresight to implement long-term improvements. It balances short-term operational necessities with strategic, long-term goals, ensuring the network's resilience and compliance with legislative standards.

Table 7 - Benefits & Disbenefits of Option 2

Benefits	Description
Reliability	Replacing assets with new (when applicable) will improve reliability / resilience
Safety	New, modern-standard assets will be safer to work on and for public in area
Safety	Balance of repair & replace with maintain high standards of safety
Environment	Replace end-of-life asset with new, long-life asset: less ongoing disruption
Environment	Reduced emissions from leaks & lower embedded carbon with effective spend
Cost	Similar levels of consumer contribution, in-line with stakeholder feedback
Cost	Replacing asset at end-of-life once exhausted repairs options = effective spend
Health / Risk	Health and risk of these assets maintained in-line with stakeholder feedback
Regulation	Maintain good relationship with regulators: compliant, with minimal findings

Disbenefits	Description
Data heavy	Requires greater investment in data collection and analytics but this does deliver a lower whole life cost and is best practise asset management

Delivery Timescales: 2026 - 2031

8.4 3rd Option Summary: Replacement Only

The Replacement Only option focuses on a proactive approach to asset management, ensuring that any component or system that fails or shows signs of potential failure is promptly replaced. This not only mitigates the risk of extensive downtime and costly reactive repairs, but also enhances overall system reliability and safety.

This option however means replacement of assets before their end-of-life, whereby affecting a repair would be sufficient, and results in significant, ineffective cost.

Table 8 - Benefits & Disbenefits of Option 3

Benefits	Description
Reliability	Replacing broken assets with new will increase reliability / network resilience
Safety	New, modern-standard assets will be safer to work on and for public in area
Health / Risk	Improved health and risk metrics

Disbenefits	Description
Environment	Significant embedded carbon increase with construction of new/disposal of old
Disruption	Increased disruption to local communities as we carry out more involved works
Cost	Significant capital cost, unpalatable to our stakeholders based on feedback
Cost	Replacing asset before end-of-life (repair sufficient) results in ineffective spend
WLC	Whole Life Cost is much greater than a balanced programme with refurbishment
Safety	Large capital construction programme results in risk to workforce and public

Delivery Timescales: 2026 - 2031

8.5 Other Things Considered

As part of the option identification process, there were a number of things considered and discounted, and therefore not progressed through to a cost-benefit analysis assessment. These are documented below:

a) Do Nothing: with the way in which we manage our population having an element of legislative compliance inspections the option of doing nothing isn't possible. As a minimum, we need to continue our inspection and maintenance programmes, and fix what is identified as being defective.

b) Service Governor Refurbishments: we have trialled this intervention, but they incur many of the costs of a replacement and do not significantly extend asset life. They are also disruptive to the consumer. The strategy for these assets is to operate them to end of life and replace.

8.6 Options Technical Summary Table

The below table details the technical summary of each option:

Table 9 - Options Technical Summary Table

	First Year of Spend	Final Year of Spend	Volume of Interventions	Equipment or Investment Design Life	Total Installed Cost
(Baseline) Reactive Only	Year 1 - 2026/27	Year 5 - 2030/31	436	~10 years	[redacted]
(1) Refurbishment Only	Year 1 - 2026/27	Year 5 - 2030/31	2,739	~10 years	
(2) Balanced Plan	Year 1 - 2026/27	Year 5 - 2030/31	2,739	~10 - 45 years	
(3) Replacement Only	Year 1 - 2026/27	Year 5 - 2030/31	2,739	~45 years	

8.7 Options Cost Summary Table

The below table details the range of costs for each Governor intervention option:

Table 10 - Range of unit costs for Governor interventions, by option number

Intervention Type	(Baseline) Reactive Only	(1) Refurbishment Only	(2) Balanced Plan	(3) Replacement Only	Unit Cost Range (£)
Inspection / Fix on Failure	✓	✓	✓	✓	[redacted]
Repair / Refurbishment		✓	✓		
Replace Component			✓	✓	
Replace Fence			✓	✓	
Replace Housing			✓	✓	
Replace Entire Installation			✓	✓	

9 Business Case Outline and Discussion

9.1 Key Business Case Drivers Description

The table below sets out the top three value drivers for each CBA, demonstrating where the majority of the monetised risk benefit is represented:

Table 11 - Key Value Drivers for Each CBA Model

	Financial Node	Description	CBA Model Percentage
District Governors	F_Domestic	Financial cost in recompensing consumers for supply interruptions	~90%
	F_Carbon	The carbon footprint value associated with the gas lost from general emissions	
	F_Restore Supply	Financial cost of restoring supply to downstream properties following a supply interruption	
I&C Governors	F_Carbon	The carbon footprint value associated with the gas lost from general emissions	~80%
	F_Loss of gas	The cost associated with the retail value of loss of product	
	F_Com small	Financial cost in recompensing industrial and commercial consumers for supply interruptions	
Service Governors	F_Corrosion Repair	Unit cost of reactively resolving identified corrosion issues at Governor sites (e.g. painting)	~81%
	F_Component Repair	Unit cost of reactive maintenance (repair or replacement) of Governor components in response to identified Failure Open or Failure Close faults. Increase in costs incurred where obsolete.	
	F_Death	Cost of death	

9.2 Business Case Summary

Our CBAs have been completed in line with Treasury Green Book Guidance and utilise the Ofgem issued model that is compliant with this guidance.

The tables below are extracted from the Ofgem issued CBA model, populated for our assets and the programmes of work considered. For further detail, please see the corresponding CBA models as submitted to Ofgem with the RIIO-GD3 Business Plan. For ease, all net-present values are summarised in Table 14.

Table 12 - NPV Relative to Baseline: District and I&C Governors

[redacted]

Table 13 - NPV Relative to Baseline: Service Governors

[redacted]

Table 14 - Summary Overview of NPV Relative to Baseline for all CBAs Associated with Governors

[redacted]

10 Preferred Option Scope and Project Plan

10.1 Preferred Option

The below table sets out the preferred option to manage our Governor population: **Option 2 - Balanced Plan**. Our plan includes all compliance-driven activities, in accordance with the Pressure Systems Safety Regulations (2000), plus also proactive interventions, where we favour refurbishment when it's still an option. This option pays back in the early 2030s. Also included in the plan are any reactive interventions based on historical experience, see volumes below:

Table 15 - Intervention volume for preferred option: Option 2, Balanced Plan

Intervention Type	Volume
Inspection	436
Refurbishment	1,025
Replace Component	520
Replace Fence	75
Replace Housing	225
Replace Entire Installation	458
Total	**2,739**

The CBA outcomes show that refurbishment only has a higher NPV however in reality, some of the assets that require intervention will have passed the point of repair / refurbishment, and replacement remains the only option. Figure 12 illustrates this.

Figure 12 - Illustrative Chart of Capex vs. Balanced Capex / Opex Strategies

The orange line illustrates asset health over time, deploying our strategy of balancing refurbishment and replacement. The black line is a pure replacement approach. Refurbishment actively extends life and 'sweats' the asset delivering a lower whole-life cost. Whilst this pushes out end of life, it does not extend indefinitely and at some point refurbishment becomes lower value and higher cost. Much like maintaining a vehicle that will run longer with regular servicing but will not run forever.

When we develop investment plans, we utilise data on asset health, faults, failures and maintenance inspections. We also have experienced engineers reporting on the suitable options for each site. Our balanced plan reflects the minimum end of life replacements needed and maximum refurbishments based on data and engineering judgement. Refurbishment only options on all sites will not deliver the safety and reliability levels required by stakeholders and will not be accepted by HSE inspectors on end of life assets. This plan offers good value for money as demonstrated by the CBA early pack-back period.

10.2 Asset Health Spend Profile

The table below details the spend profile, by year, for Governor interventions:

Table 16 – Governors spend profile

	2026/27 (£m)	2027/28 (£m)	2028/29 (£m)	2029/30 (£m)	2030/31 (£m)	Total (£m)
Spend						

10.3 Investment Risk Discussion

The future of energy in the UK is not certain over the long term, with the Future Energy Scenarios (FES) offer a number of pathways to 2050. We have considered these pathways when testing the robustness of our investment plan against future uncertainty, ensuring that it supports all credible pathways and avoids the risk of asset stranding.

The Offtakes & PRIs assets identified for proactive intervention have been tested using CBA. This gives a view on the time period over which an investment pays back i.e. at what point in time it becomes lower cost to invest than to not invest. Our test is whether this point in time at which the investment pays back is within the useful lifespan of the asset. If an asset was expected to be needed as part of the UK energy network until 2040 but not beyond, investment paid back by 2035 remains beneficial to bill payers. If the investment didn't pay back until 2042 then we would consider options to extend asset life within the expectations on us to keep the public safe.

The ongoing role of the gas network and the importance of maintaining resilience and security of supply is widely recognised beyond government, even taking longer term uncertainty into account. For example, all Future of Energy (FES) 2024 scenarios involve at least 20% of homes still on natural gas in 2045, even as many transition to electrification or hydrogen and NESO's Clean Power 2030 advice on the required gas generation capacity referenced above. As the gas system needs to meet peak demands, substantial infrastructure for safe, reliable supplies will be required even in scenarios where annual throughput may have significantly dropped.

All Future Energy Scenarios show a decrease in gas volumes albeit over different time periods and to different scales. If 50% of consumers in a street came off the gas network, the pipes feeding the street would still be required to service the other 50% of consumers, as would the district governors feeding the street, the higher-pressure pipes feeding the governor, the PRIs feeding the higher-pressure pipes and so on.

This challenge is exasperated by government policy and approach to electrifying heat, where the decision is left to consumers rather than a mandated approach targeting regions. With this approach, it is incredibly unlikely whole areas will leave the gas network in the short and medium term. If it does happen, it will be a much more sporadic move from gas, resulting in a requirement to operate our assets until the last consumer in a region decides to transfer.

Another challenge is FES gives UK wide pathways and does not provide a view and data on the individual GDN regions. This presents significant limitations in its usefulness with very broad assumptions required to influence regional plans.

The chart below shows how previous FES scenarios have not reflected the experienced reality.

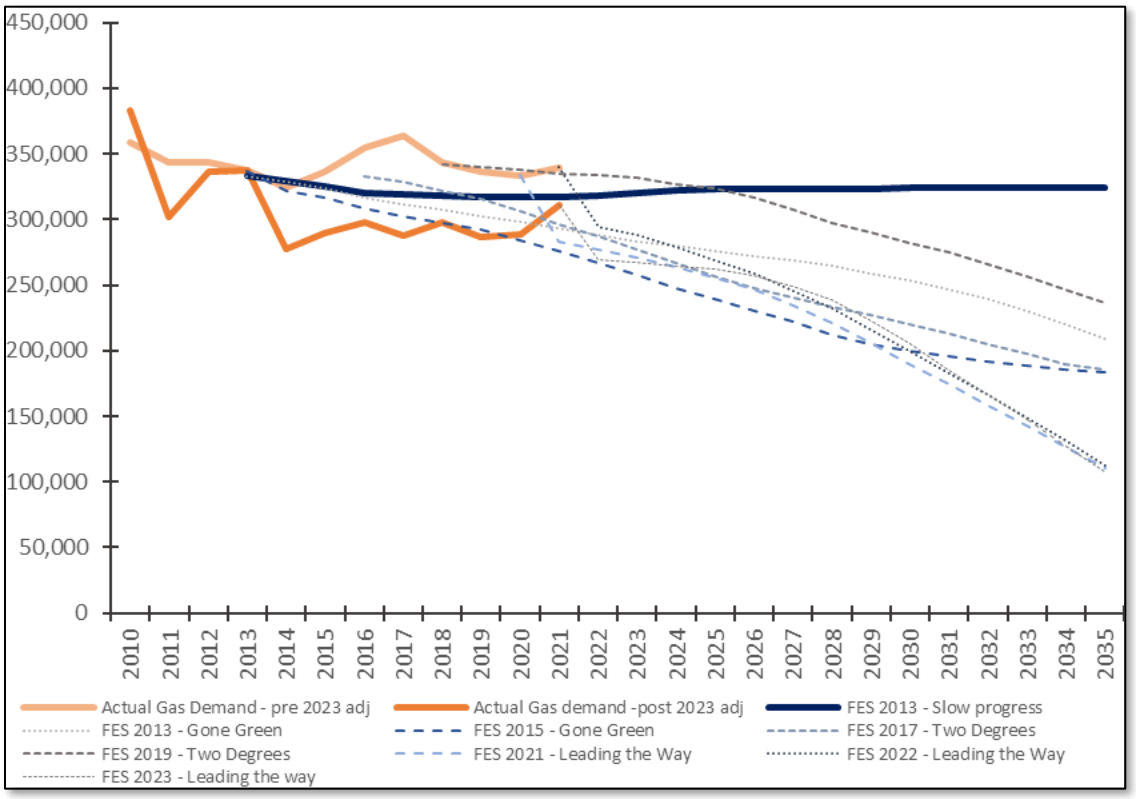

Figure 13 - Historical residential gas demand against most optimistic scenario in every 2nd year of publication, dating back to 2013

It should be noted that in the 2023 FES scenarios there was an adjustment to historical gas demand figures, and as such we have shown historical data both before and after the adjustment to maintain comparability with the original 2013 forecast. What is noticeably clear from these graphs is that, to date, the most accurate forecast appears to be the 2013 slow progress. As such it is difficult to have confidence that future forecasts will be any more reliable.

Due to slower and geographically dispersed take-up of heat pumps, and whilst we wait for the Heat Policy decision, moving to a short payback period cut-off for investments is not compatible with ensuring a safe, resilient, and efficient gas network while we transition to Net Zero. The gas sector collectively believes 25 years as a payback period is more realistic across all scenarios and prudent given the sector's legislative duties.

To manage sensitivities in delivery costs and benefits, we are using a prudent 20-year period to assess cost and benefits. This means investments paying back within this period can be justified with a high level of confidence.

10.4 Project Plan

The project plan in Table 17 below details the various stages of the project from the initial workload iteration stage through to record update and project completion. We don't envisage any long lead-time items that will put a RIIO-GD3 delivery in jeopardy, with all items able to be purchased and delivered within 3-6 months.

Table 17 - Project Plan of RIIO-GD3 Planned Investment

		RIIO-GD2 Year 5				RIIO-GD3 Year 1				RIIO-GD3 Year 2				RIIO-GD3 Year 3				RIIO-GD3 Year 4				RIIO-GD3 Year 5			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
RIIO-GD3 Programme - Year 1	First Iteration of Workload																								
	Detailed Scoping & Refinement																								
	Final Draft, Business Approval																								
	Purchase Long-Lead Time Items																								
	Project Delivery Period																								
	Project Completion, System Updates																								
RIIO-GD3 Programme - Year 2	First Iteration of Workload																								
	Detailed Scoping & Refinement																								
	Final Draft, Business Approval																								
	Purchase Long-Lead Time Items																								
	Project Delivery Period																								
	Project Completion, System Updates																								
RIIO-GD3 Programme - Year 3	First Iteration of Workload																								
	Detailed Scoping & Refinement																								
	Final Draft, Business Approval																								
	Purchase Long-Lead Time Items																								
	Project Delivery Period																								
	Project Completion, System Updates																								
RIIO-GD3 Programme - Year 4	First Iteration of Workload																								
	Detailed Scoping & Refinement																								
	Final Draft, Business Approval																								
	Purchase Long-Lead Time Items																								
	Project Delivery Period																								
	Project Completion, System Updates																								
RIIO-GD3 Programme - Year 5	First Iteration of Workload																								
	Detailed Scoping & Refinement																								
	Final Draft, Business Approval																								
	Purchase Long-Lead Time Items																								
	Project Delivery Period																								
	Project Completion, System Updates																								

10.5 Key Business Risks and Opportunities

The table below summarises risks and mitigations related to delivery of our plan for this asset group:

Table 18 - Summary of Risks & Impacts of the Delivery Plan

Risk Description	Impact	Likelihood	Mitigation/Controls
Programme does not manage risk to required levels	WWU would not be meeting agreed targets for RIIO-GD3	<=20%	We have invested in data and analytics. Probability of failure and deterioration curves have been validated against reality. As long as the physical programme is delivered, this risk is minimal.
Risk to delivery timescales	Increased cost to recover programme if falling behind. Benefits to consumers not realised in a timely manner. Wouldn't comply with HSE mandated requirements	<=20%	We have established processes in place to deliver programmes such as this and have successfully delivered in RIIO-GD2. We have a robust workforce resilience strategy as documented in our RIIO-GD3 submission. Delivery of our investment plans are monitored at Exec / CEO level in our organisation.
Risk to planned costs	Consumers and WWU paying more than planned for work making it less cost beneficial. If cost is below planned cost, then consumers and WWU benefit from Total Expenditure (Totex) sharing incentive	<=20%	We hold excellent data on these assets, and we scope work well in advance. We have an excellent track record in delivering programmes like these. We operate an insourced delivery model for the bulk of our Governor programme. Therefore, risk is minimal.

10.6 Outputs included in GD2 Plans

Although some preparatory work for the RIIO-GD3 programme will be completed in RIIO-GD2, no physical and hence, outputs, will move between the two price controls. We will deliver on our RIIO-GD2 commitments within the price control so no rolling over to RIIO-GD3 of work that should have been completed.