DD Supporting Evidence: EJP17

Pressure Reduction on Offtakes and PRS

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1 Executive Summary

We note Ofgem's draft determination feedback indicating they recognise the need for investment on our pressure reduction; however, a full engineering assessment was not possible and have requested further data sources to support the assessment, therefore currently grading this investment case as unjustified.

In our response we will:

- Explain how workload volume is derived and the difference between number of sites and number of pressure reduction systems.
- Clarify how asset health scores have been derived and how they have been used in our modelling.
- Provide the global data deposit requested along with a SOP (standard operating procedure) that provides line of sight to our preferred option.

For clarity, the feedback provided by Ofgem for EJP17 – Pressure reduction on offtakes and PRS is shown below (**Error! Reference source not found.**)

Feedback Source	Needs Case	Optioneering	Scope Confidence	Comments
RIIO-3 Draft Determinations – Cadent **Table 34: Summary of Cadent Engineering Recommendations**	Partially Justified	Partially Justified	Medium confidence	Proposed Outcome: Unjustified as the costs and data that were provided are less than any alternative option available in the EJP. Cadent propose to invest in the highest risk pressure reduction systems based on condition. Cadent did not provide additional data when requested. The data provided is for risk score only and confirmation of investment. Asset health data and intervention proposed was not provided. This meant we could not complete a detailed engineering analysis. 11 sites have data which did not reconcile with other cost details provided in the EJP which created further uncertainty. The investment is considered unjustified, with further data required to support justification of the investment needs case
22nd July Ofgem Engineering – Cadent Bilateral	• Provide information on LTR (long term risk) definitions • Provide average condition scores and stacked bar charts for programme options • Provide further clarity on costs and how they align to our EJP			

Table 1: Specific EJP17 feedback from the RIIO-3 Draft Determinations Cadent Annex

2 Introduction

This document provides additional information in response to Ofgem's engineering review comments in Table 34 of the Draft Determination (July 2025) and feedback received at the bilateral on 22nd July 2025. It addresses concerns regarding asset data reconciling to the preferred engineering option, (S08), whole life net benefit and asset health with RIIO-2 spend cap. This response outlines our methodology for forecasting intervention volumes, clarification of asset health scoring and re-framing our preferred option in the context of asset risk.

3 Draft determination responses

3.1 Global data

For this EJP, Ofgem deemed it unjustified due to insufficient data, as per Table 34 of the Cadent annex in the draft determination. Cadent is committed to providing further information and clarification through our Draft Determination response and through the ongoing bilateral discussions, and as such have provided the requested data.

This assessment and comment from Ofgem was common across the mechanical assets. We therefore have provided a unified response on the process for modelled investment, a procedure for the interpretation of the asset workbook, and the workbook containing asset data. Please refer to the other documents submitted within this DDQ response for the specific documents:

1. DD – Mechanical process narrative
2. DD – Mechanical – SOP
3. EJP17 – DD – DATA – Pressure reduction on Offtakes and PRS', which includes a summary tab where asset health score can be found, and a tab for LTR (Long Term Risk) definitions can be found.

3.2 Workload volume discrepancy

During the SQ (supplementary questions) process that ran from January until March 2025, OFGEM submitted an SQ (SQ_047) relating to pressure reduction on offtakes and PRS on 29th January 2025. Within this question, specifically part 2, OFGEM requested clarity on workload volume. The below explains why and how to determine the volumes in the workbook, EJP17 – DD – DATA – Pressure reduction of offtakes and PRS.

The apparent discrepancy in workload volumes is due to the way we have counted and presented the workload in different documentation. Within EJP17- pressure reduction on offtakes and PRS, section 10, the workload is presented at system level. This is the number of individual pressure reduction systems that we will invest in within RIIO-3. The workload volume presented in EJP17 – SE – Embedded data, Annex D, was counting the number of sites that we would invest in within RIIO-3.

However, we have noticed that Alrewas Offtake was being counted twice and should have only been counted once. This is because the site straddles across two networks and has systems on the East Midlands network and West Midlands network. We have rectified this count and therefore the count is 112 systems across 99 sites.

This can be displayed in the workbook by filtering on column W – GD3 intervention type selected and untick 0 – no investment. By counting the number of individual system ID's in column G – SAP hierarchy reference you will arrive at the 112 systems. By counting the number of individual site names in column C -site name, this will arrive at the 99 sites.

4 Bilateral Clarification Responses

4.1 Asset health and risk

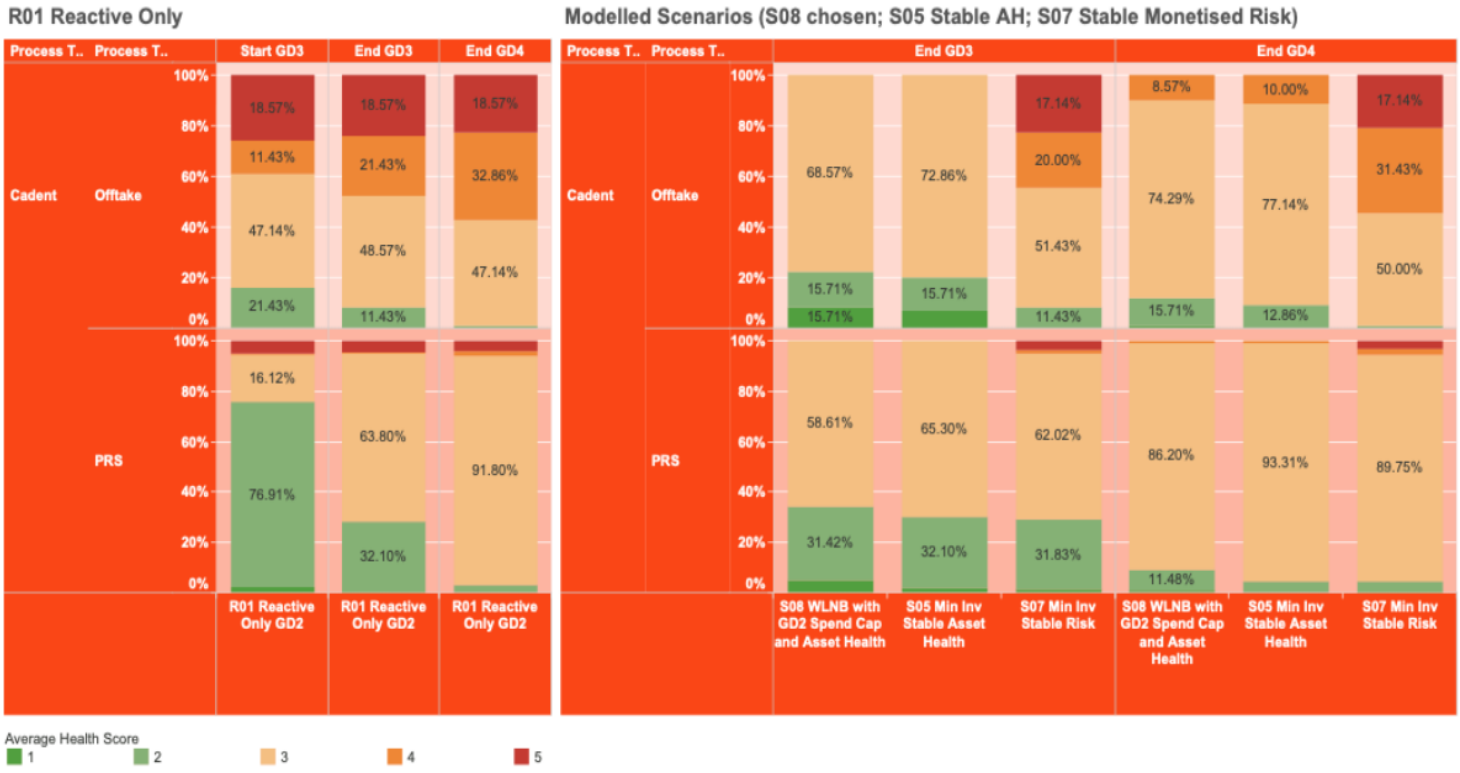
Our preferred Pressure Reduction programme protects network health and delivers sustainable value over alternative reactive programmes. The below tables and graphics compare alternative programme options against the reactive baseline (R01), our preferred programme option (S08), the minimum investment for stable asset health (S05) and minimum investment for stable risk (S07), showing the position at the start of RIIO-3, end of RIIO-3 and end of RIIO-4.

Table 2 compares how the three programme options vary through the application of different constraints (see DD – Mechanical process narrative, section 4.5 – scenario definition and optimisation).

Investment Scenario (Constraint)	Scenario Description	How the scenario / constraint works in the model	CAPEX (£m)
(R01) Reactive only	No proactive investment in our pressure reduction systems	Used as baseline for volume and cost of repairs, and monetised risk position	[redacted]
(S08) WLNB with RIIO-2 spend cap and asset health	Selects asset investments that are most cost beneficial to undertake in RIIO 3 whilst also improving the health of assets that are at health score 4 or 5, ensuring overall network average health remains stabilised to 2024/5 levels up to a spend cap equivalent to outturn spend in RIIO-2.	The model prioritises system replacements or refurbishments that deliver the highest Net Present Value (NPV) and those projected to exceed a condition grade of 3.9 by the end of GD3 without intervention. It also enforces a constraint to keep the network-wide average health score at or below 3.0. All requirements must be met within a spend cap equivalent to RIIO-2 outturn. NPV is calculated as the difference between discounted benefits and costs over the period 2027–2050.	[redacted]

(S05) Maintain Asset Health Levels	Target poor health assets (score 4 or 5) and stabilise network health to 2024/25 levels.	Selects assets forecasted to exceed score 3.9 by RIIO-3 end; maintains average health baseline at lowest capex.	[redacted]
(S07) Maintain Asset Risk Levels	Keep overall monetised risk (safety, supply, carbon, repair) at or below RIIO-2 levels.	Invests in cost-effective interventions to prevent monetised risk increase, while recognising ongoing asset deterioration.	[redacted]

Table 2: Programme options comparison



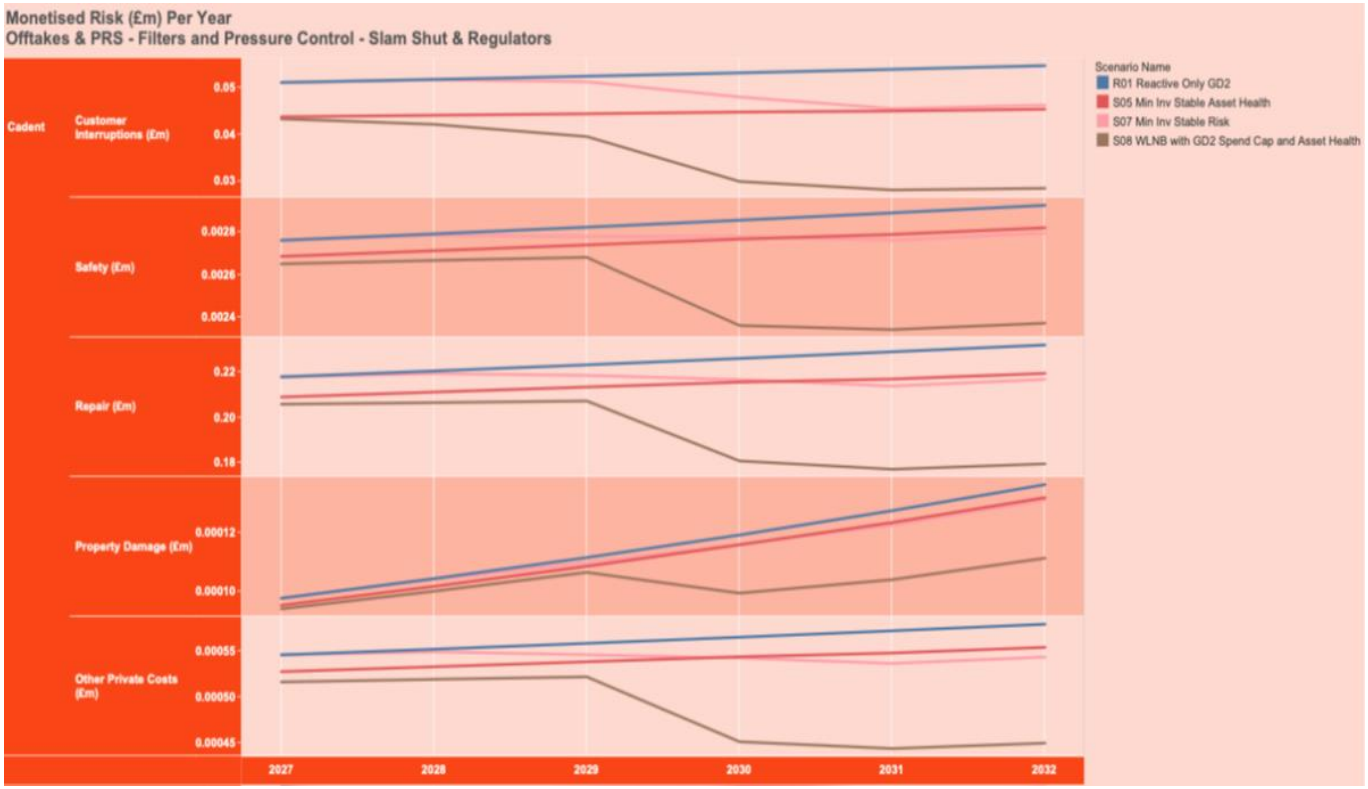
The above graphic shows how the distribution of asset health grades (1–5), which are explained further on the summary page of EJP17 - DD – DATA – Pressure reduction on offtakes and PRS, for pressure reduction systems changes across the RIIO-3 and RIIO-4 periods, under four of our programme scenarios. Under the reactive only scenario, there is a noticeable shift from assets with better asset health grades (grades 1 and 2) moving to the poorer asset health grades (3, 4, and 5), highlighting the natural deterioration that occurs without any proactive investment, over a 10 year period, out to the end of RIIO-4. Therefore, the CAPEX that would be required to stabilise asset health or return to RIIO-2 end health position would be significant.

Our S08 programme scenario (WLNB and asset health within a RIIO-2 spend cap), demonstrates a more balanced asset health distribution, with a slower rate of declining asset health and a greater proportion of assets remaining in asset health grades 1-3, with all 4's and 5's being removed. Whilst asset health score 4's are present by the end of RIIO-4, our preferred option has a smaller number of 4's, and a greater proportion of 1's and 2's.

S05 is comparable at end RIIO-3 to S08 and cost less however looking to RIIO-4 we see S08 offers a 'healthier' asset base. In RIIO-3 we have a focus on unsupported flow control valves on offtakes and due to the size and complexity of these sites there is an increased cost to manage the risk, which is why there is a delta in spend between S05 and S08. If we did not address these assets on critical sites in RIIO-3, we expect the capex required in RIIO-4 to increase to address asset health grades 3 & 4 deteriorating assets on top of the uninvested asset health grades 4 & 5 in the S08 scenario to manage the risk on our offtakes. Additionally, under S08, there is a higher likelihood that we will have to reactively intervene and/or increase maintenance/ monitoring at these sites, for which spares, and soft parts are no longer supported by manufacturers at these sites which would likely cost more than the current S05/S08 spend difference.

The stable risk scenario (S07), although maintaining overall monetised risk, allows asset health to degrade in a similar way to the reactive only approach (R01), demonstrating that stabilising monetised risk does not equate to maintaining physical asset health.

Overall, the graphic supports the case that targeted investment, as seen in our preferred S08 scenario, helps slow deterioration. It also underlines that stable monetised risk strategies may obscure underlying asset deterioration, leading to future spikes in capital expenditure to restore asset health and integrity.



Average Network Asset Health Score
Offtakes & PRS - Filters and Pressure Control - Slam Shut & Regulators

Process Type L1	Scenario Name	Start GD3	End GD3	End GD4
Cadent	R01 Reactive Only GD2	2.82	3.18	3.54
	S08 WLNB with GD2 Spend Cap and Asset Health	2.70	2.91	3.34
	S05 Min Inv Stable Asset Health	2.69	3.05	3.44
	S07 Min Inv Stable Risk	2.82	3.13	3.51

Our preferred pressure reduction strategy (S08) delivers lower risk and better asset health by end of RIIO-3 compared to other scenarios. The above chart illustrates that all scenarios, with the exception of our preferred scenario, does not materially reduce the monetised risk in key asset performance areas of safety and security of supply. Given the asset risk associated with deteriorating, unsupported assets on some of our offtakes, there are clear safety, repair and security of supply benefits as result of S08 investment. It demonstrates that focusing on stabilising monetised risk isn't enough to keep our assets from physically deteriorating and is broadly comparable to the reactive investment only scenario (R01). Asset risk levels can be influenced by things like downstream impacts or larger sites, which means the physical condition of assets can still deteriorate even if the overall monetised risk looks stable. Over time, this can lead to more faults, increased reactive spending, and bigger capital investments down the line to fix the network and bring it back to an acceptable level.

That's why our approach looks at striking a balance between reducing risk, maintaining asset health, and delivering long-term value. Looking at the other scenarios, (R01) reactive only case shows a sharp increase in average asset condition, from 2.82 to 3.54 due to no RIIO-3 investment. Our preferred S08 scenario also sees some decline, owing to a spend cap, but it's far less severe. The S05 Stable Asset Health scenario proves that with the right investment, we can keep asset condition steady through RIIO-3, however our preferred scenario performs better. And the S07 monetised risk stable scenario, despite aiming to manage risk, ends up with similar deterioration to R01, reinforcing the point that managing risk alone doesn't protect asset health.

4.2 How costs have been applied to assets

During the SQ (supplementary questions) process that ran from January until March 2025, OFGEM submitted an SQ (SQ_047) relating to pressure reduction on offtakes and PRS on 29th January 2025. Within this question, specifically part 6, OFGEM requested clarity on the cost breakdown and the cost discrepancy. Detail explain the breakdown of costs was provided back to OFGEM on 5th February 2025. At the bilateral with the engineering team at OFGEM on 22nd July 2025, we understand further clarity is required as Ofgem have derived a different (lower value) by combining a flat unit cost with the forecast workload.

The reason the not every site or system has a flat rate unit cost is explained within EJP17 and is due to the rules we have applied for numbers of assets in a system and number of systems on a site. We have explained these rules in more detail in the workbook in this DDQ response (EJP17 - DD – GAD – Pressure reduction on offtakes and PRS) on the costing rules tab. However, for full transparency we have also included them in the table below.

	Pressure reduction systems	Flow control valve (FCV) systems	Rules
Full system replacement			
2 streams or less	69	2	Standard unit cost
3 streams	4	2	Cost multiplied by 1.5
4 streams	1	0	Cost multiplied by 2
Major refurbishment			
2 streams or less	6	7	Standard unit cost for PRS, 0.5 x full replacement cost for FCV
3 streams	1	0	Cost multiplied by 1.5
4 streams	0	0	Cost multiplied by 2
Minor refurbishment			
2 streams or less	19	0	Standard unit cost

	Pressure reduction systems	Flow control valve (FCV) systems	Rules
3 streams	0	0	Cost multiplied by 1.5
4 streams	1	0	Cost multiplied by 2
Total	101 systems	11 systems	Total 112 systems

Table 3: Pressure reduction costing rules

5 Conclusion

Our preferred pressure reduction strategy (S08) presents a balanced, risk-informed, and cost-effective approach to managing asset health and safety across RIIO-3 and RIIO-4. It directly addresses Ofgem's concerns by providing the requested global asset data and a clear SOP for interpreting asset health and risk. Additionally, there is a clear explanation on cost allocation and how this subsequently applies to our RIIO-3 intervention forecast.

The evidence demonstrates that while alternative scenarios such as S07 may maintain monetised risk, they do not prevent physical asset deterioration. This leads to increased reactive spend and future capital investment, particularly on critical offtake sites where components are unsupported and failure risks are higher. Our modelling shows that S08 slows deterioration, maintains a healthier asset base, and delivers long-term value within a RIIO-2 spend cap.

Importantly, S08 outperforms reactive and risk-only strategies in both asset health and safety/security of supply metrics. It compares favourably to S05 when considering RIIO-4 outcomes, with fewer assets in poor health grades and reduced likelihood of reactive interventions. The cost delta between S05 and S08 is justified by the complexity and criticality of the assets targeted in RIIO-3, and the long-term benefits of proactive investment.

We believe this response provides the necessary transparency, data, and engineering rationale to support a fully justified investment case for pressure reduction assets on offtakes and PRS.