

Date

1 November 2019

Cadent Gas Limited

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**Thomas Mackenzie**

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Dear Tom,

Proposed modification to the large scale interference damage calculation applicable for the formulation of shrinkage volumes for incentive determination purposes.

Summary: Gas Distribution Networks (GDNs) have an obligation under Special Condition 1F of the GT Licence to consult on any proposed modifications to the Shrinkage and Leakage Model. This communication details the reasons and recommendations for modifying the calculation for large scale interference damage calculations. The GDNs identified a potential weakness in this methodology during review of the incentive mechanisms introduced for the RIIO-GD1 Price Control Period, whereby GDNs could be subjected to windfall incentive gains or losses for influencing factors outside of their direct control.

Background: The current Shrinkage and Leakage Model (version 1.4) takes account of gas emissions associated with damage caused by third party interference on the gas supply system. Such losses equate to approximately 0.3% of all distribution network leakage annually. The Shrinkage and Leakage Model classifies these incidents in two different ways:

- Large incidents, i.e. those causing gas releases in excess of 500kg
 - Where the actual volume of gas released has been estimated, the estimate is used.
 - Where the actual volume has not, or cannot be estimated, 500kg per incident is assumed.
- Other incidents
 - Leakage is estimated by multiplying the number of incidents by fixed leakage rates and fixed response and repair times.

Whilst it may be reasonable to incentivise GDNs on the volume reduction of incidents, which could be achieved for instance through industry and landowner awareness, the volume of gas lost can vary year to year, with single events potentially having a disproportionate effect on overall emissions. None of these incidents reflect the underlying annual reductions in shrinkage achieved through replacement of metallic mains, control of system pressures and use of mono-ethylene glycol.

If such an incident or incidents occurred in year 8 of the price control the rolling incentive mechanism would multiply the impact by eight. This is clearly an anomaly in the incentive mechanism and was recognised by Ofgem in the RIIO GD1 Final Proposals.

"2.26. We recognize that revenues under the rolling incentive will be strongly influenced by companies' performance in the last year of RIIO-GD1. This performance could be influenced by factors outside GDNs control such as third party damage to gas mains. To mitigate for this, we welcome modifications to the shrinkage model (used by GDNs to calculate and report shrinkage

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and leakage) which addresses this issue whilst continuing to place the right incentives on companies to manage shrinkage and leakage.”¹

Industry engagement: In the *Joint Distribution Network Shrinkage and Leakage Review 2014/15*² the GDNs signalled their intention to raise a modification to the Shrinkage and Leakage Model in respect of large scale interference damage. This modification would be designed to mitigate any distortion of the incentive outcomes due to factors outside the GDNs control. The potential modification of the interference damage calculation was part of the standard agenda at the quarterly Shrinkage Forum, chaired by the Joint Office of Gas Transporters, and attended by both GDNs and Gas Shipper representatives. This gave the GDNs opportunity to discuss and engage with interested parties and encourage involvement in the formulation of an appropriate model modification.

Industry consultation: In September 2015, Cadent Gas on behalf of all GDNs jointly issued *Model Modification Consultation No.05 – Revision of the Interference Damage Calculation*³. This consultation sought views on revising the interference damage calculation to assume a fixed level of 500kg per incident. This would be applicable for both the calculation of incentive performance and for the allocation of gas usage. The changes proposed would still provide an incentive for GDNs to manage the volume of these incidents without being exposed to the potential variation associated with actual leakage volume calculations, which are outside of their control.

Responses to our statutory consultation: We were grateful to receive one non-confidential response to our statutory consultation from British Gas⁴, this formed the basis of a change in our approach to the modification proposal. The representation focused on two different areas of concern:

- The proposed revision should be assessed as a part of the RIIO-GD1 mid-period review.
- The current approach to the estimation of volumes of gas lost through large gas release incidents should be retained for the calculation of shrinkage for the purposes of gas allocation.

The recommendation suggesting the consultation is assessed as part of the RIIO-GD1 mid-period review focused in one part on the intention of the incentive. British Gas felt that “*while the proposal may mitigate the distortive effect of the ‘roller’, we are concerned it may inherently result in a change in focus on the behaviours the Shrinkage Incentive was designed to encourage*”. The GDNs consider that the incentive mechanism provides rewards for the enduring reduction of the controllable causes of fugitive emissions. In the case of large scale interference damage reports the one element that GDNs felt there was opportunity to directly influence was the reduction in the number of the incidents. Changing to a fixed lost gas assumption per incident, so they all have equal weighting, the focus will be on reducing the quantity of the incidents.

The representation also challenged if this modification is following the appropriate route for proposition of change or whether it would be better captured within the mid-period review. The GDN view is that the mechanism for modifications is set out in Special Condition 1F of the GDN licence and that we have adhered to this approach.

Using the current methodology, if a GDN entered the final year of the price control period with a quantity of ten non-estimated releases they would be in a more beneficial incentive position against a scenario where only one release occurred but was estimated at 40,000kg of gas loss. This is exemplified in the table overleaf.

¹ <https://www.ofgem.gov.uk/ofgem-publications/48155/2riiogd1fpoutputsincentivesdec12.pdf>

² <https://gasgov-mst-files.s3.eu-west-1.amazonaws.com/s3fs-public/ggf/2014-12-23%20Joint%20DN%20201415%20SLM%20Review%20Final%20Report.pdf>

³ <https://gasgov-mst-files.s3.eu-west-1.amazonaws.com/s3fs-public/ggf/Consultation%20Paper%20No%205%202015%20-%20Leakage%20Model%20-%20Revision%20of%20the%20Interference%20Damage%20Calculation.pdf>

⁴ <https://gasgov-mst-files.s3.eu-west-1.amazonaws.com/s3fs-public/ggf/British%20Gas%20response%20-%20interference%20damage%20methodology%20consultation.pdf>



Scenario	Number of Reports	Estimated Volumes	None Estimated	Total Emissions
Scenario 1. Interference Damages reported >500kg (None estimated)	10	0	5,000kg (10 incidents x 500kg)	5,000kg
Scenario 2. Interference Damages reported >500kg (Estimated volumes)	1	40,000kg	0	40,000kg

If this proposed methodology change was adopted and the DNs influenced a reduction in the number of interference damage reports (as demonstrated by scenario 2) then the emissions estimated for incentive calculation and gas allocation purposes would be 500kg instead of the 40,000kg reported, which would result in reward for the DNs for the reduction in the quantity of large scale interference damage incidents.

The representation further challenged the appropriateness of treating the calculation for incentive purposes and the allocation of gas in a uniform manner. In specific reference to the calculation of shrinkage for gas allocation purposes the representation stated “*One such impact is the artificial reduction of shrinkage, which, necessarily, results in an artificial increase in the volumes of ‘unallocated’ gas (UG).*” and “*As, the cost of UG is borne solely by the Small Supply Point sector, the proposal will systematically lead to an increase in the costs faced by these customers for instances in which the estimated volume of gas lost through any large incident exceeds 500kg*”. We are grateful for this stakeholder feedback and have reflected on whether the original approach proposed, was indeed in the best interests of customers, and consequently proposed an alternative solution.

Subsequent industry consultation: In May 2016, Cadent Gas on behalf of all GDNs jointly issued *Model Modification Consultation No.05 – Revision of the Interference Damage Calculation v2.0*⁵. On consideration of stakeholder feedback received during the initial consultation the GDNs proposed that the modification to the interference damage calculation should only be modified for the calculations used to determine performance against incentive baselines, and not the determination of actual gas volumes. This would still provide an incentive for the GDNs to influence the reduction in the number of interference damage incidents without being exposed to the potential variation associated with ‘one off’ incidents of a large magnitude.

In response to the feedback received from the stakeholder representation from British Gas, we propose that the determination of leakage for cost allocation purposes would remain unchanged. The proposed approach to effectively calculating two different leakage volumes has parallels to the calorific value (CV) used within the Shrinkage and Leakage Model. The CV used for the calculation of gas losses for allocation purposes is the actual recorded CV whereas for incentive purposes a baseline CV is used. This removes opportunity for windfall gains and losses within the incentive calculation for a component outside of the DNs influence.

Responses to our statutory consultation: We were grateful to receive one non-confidential response to our statutory consultation from British Gas⁶. The representation supports the removal of the influence of the modification on the gas allocation element of leakage calculation; however a number of recommendations are articulated:

- Emphasis on the reduction in gas transportation losses should be maintained.
- The 8-year average performance should be used to minimise the distortive effect on the ‘roller’ mechanism.

⁵ <https://gasgov-mst-files.s3.eu-west-1.amazonaws.com/s3fs-public/ggf/Consultation%20Paper%20No%205%202015%20-%20Leakage%20Model%20-%20Revision%20of%20the%20Interference%20Damage%20Calculation%20v2.0.pdf>

⁶ <https://gasgov-mst-files.s3.eu-west-1.amazonaws.com/s3fs-public/ggf/BG%20response%20-%20interference%20damage%20Jun%202016.pdf>



The first point of recommendation focused on the sentiment of the incentive and that it would be inappropriate to focus on the reduction in the number of large release incidents instead of the volume of gas lost. The incentive mechanism is intended to provide reward for the enduring reduction of the controllable elements of gas loss. In other elements of the calculation methodology, for example Mains Replacement, the removal of pipes with a greater leakage rate to those of a polyethylene construction results in a leakage reduction benefit. In the case of large scale interference damages the uncertainty in the volumes lost (which are influenced by third party activities) results in a scenario where GDNs could influence the reduction of the actual quantity of interference damages year on year yet still be penalised for gas loss increases.

The second point of recommendation describes a mechanism whereby for the final year the eight year annual average is used. The GDNs consider that Ofgem’s intent for the eight year ‘roller’ mechanism incentive regime is to promote investment in areas of enduring improvement. The introduction of an eight year annual average would undermine this approach, effectively, if a distribution network influenced a year on year improvement in the volume of lost gas, with the final year being the best performing, the introduction of an eight year annual average would artificially inflate the final year performance.

The table below demonstrates possible impacts of the proposed eight year annual average.

Year	Scenario 1: GDN Proposed Change		Scenario 2: Eight Year Average		Scenario 3: Eight Year Average	
	Incidents	Total	Incidents	Total	Incidents	Total
1	10	5,000kg	10	5,000kg	5	2,500kg
2	10	5,000kg	10	5,000kg	6	3,000kg
3	9	4,500kg	9	4,500kg	7	3,500kg
4	9	4,500kg	9	4,500kg	9	4,500kg
5	7	3,500kg	7	3,500kg	9	4,500kg
6	6	3,000kg	6	3,000kg	10	5,000kg
7	5	2,500kg	5	2,500kg	10	5,000kg
8	4	2,000kg	4	2,000kg	10	5,000kg
Used Quantity Year 8	4	2,000kg	7.5	3,750kg	8.25	4,125kg

In the theoretical scenarios above, scenario 1 demonstrates an annual reduction in interference damage incidents which when allocated a flat 500kg leakage rate results in an annual reduction in leakage. In scenario 2, using the calculation methodology proposed in the representation, the final year volume is calculated at 3,750kg. This has the effect of artificially increasing the overall outturn emissions volumes. Furthermore, in scenario 3, where a GDN had annual increases in incident volumes, the eight year annual average would underestimate the final year outturn position and facilitate windfall incentive gains.

Subsequent industry consultation: In July 2018, Cadent Gas on behalf of all GDNs jointly issued *Model Modification Consultation No.05 – Revision of the Interference Damage Calculation*⁷. The GDNs decided to review the proposal issued in May 2016 due to the industry challenge to determine if a better option existed for modifying the calculation. After consideration and reviewing industry feedback the GDNs believed that the methodology change proposition detailed in May 2016 was the best way of reflecting enduring improvement, whilst removing the risk of windfall incentive gains or losses. The GDNs issued the proposal again for consultation to

⁷ <https://gasgov-mst-files.s3.eu-west-1.amazonaws.com/s3fs-public/ggf/page/2019-03/Leakage%20Model%20Consultation%205%20-%20Revision%20of%20the%20Interference%20Damage%20Calculation%20v3.pdf>



give the industry, including those who hadn't previously commented, the opportunity for feedback.

Responses to our statutory consultation: We were grateful to receive one non-confidential response to our statutory consultation from Centrica (formerly British Gas)⁸. The representation reiterates those views shared in the May 2016 consultation, of which our responses remains as those explained above.

Recommendations: The GDNs consider that the modification proposal submitted for consultation in both May 2016 and July 2018 is a methodology change that would effectively remove the risk of windfall incentive gains or losses associated with a leakage component outside their control, and would recommend implementation of this modelling methodology with effect from 2019/20.

The GDNs are of the opinion that by removing the influence of gas loss volumes on the incentive determination and focusing on quantity of third party damages this will incentivise GDNs to more directly influence the number of third party damages experienced within each network and so manage shrinkage and leakage effectively in accordance with Ofgem's intentions.

Because the actual calculations are unaffected by the proposals, the modification would not require qualification of the revised Shrinkage and Leakage Model by an external auditor. The change is instead simply effected by the manner in which interference damage incidents are input into the model.

Background analysis shows that should the proposed modifications to the Shrinkage and Leakage Model be implemented, it would be appropriate for the shrinkage and leakage baselines to be revised for Northern Gas Networks by 1 GWh, this is detailed within *Model Modification Consultation No.05 – Revision of the Interference Damage Calculation v2.0*⁹, from the time of implementation of the modification. All other Distribution Network Operators baselines would remain unchanged.

Cadent Gas request that Ofgem consider and approve the modifications to the Shrinkage and Leakage Model detailed within this letter and the associated modification documents and instruct the changes to the leakage methodology for large scale interference damages.

Yours sincerely,

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By email

⁸ <https://gasgov-mst-files.s3.eu-west-1.amazonaws.com/s3fs-public/ggf/page/2019-03/Centrica%20response%20-%20interference%20damage%20Aug%202018.pdf>

⁹ <https://gasgov-mst-files.s3.eu-west-1.amazonaws.com/s3fs-public/ggf/page/2019-03/Leakage%20Model%20Consultation%205%20-%20Revision%20of%20the%20Interference%20Damage%20Calculation%20v3.pdf>