

## Shrinkage and Leakage Model Consultation No. 05

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### Proposed Revision to the Shrinkage and Leakage Model in respect of the Interference Damage calculation applied for incentive purposes

#### Version 3.0

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#### **Overview:**

Gas Distribution Networks (GDNs) have an obligation under *Special Condition 1F* of the GT Licence to consult on proposed modifications to the Shrinkage and Leakage Model.

The GDNs are proposing a revision to the Interference Damage leakage calculation methodology to address potential windfall gains or losses that may arise following changes to the incentive mechanisms introduced for the RIIO-GD1 Price Control Period.

GDNs have previously published two consultations relating to changing the methodology used to determine >500kg Interference Damage leakages. The initial consultation document was revised after discussion with, and representation from Shippers during the consultation period. The feedback questioned the appropriateness of a singular change to methodology, which although simplifying the process, would impact the calculation of operator outperformance of baselines along with the allocation of lost gas. The impact on allocation of lost gas would remove accuracy from the overall shrinkage assessment and also the unallocated gas process.

The GDNs published a second consultation document proposing a change to the calculation of leakage, but this time only for calculating performance against Ofgem baselines and not impacting those calculations used for gas allocation purposes. This consultation again received Shipper representation, the recommendation being that an 8 year average of performance should be used to minimise the distortive effect on the 'roller' mechanism and that the emphasis on reduction in gas losses from large scale interference damages, which is outside of GDN influence, should be maintained. Since receipt of this representation the GDNs have been discussing the impact of moving to this approach and attempting to determine a better mechanism than that proposed.

The mechanics of the rolling incentive mechanism for the RIIO-GD1 price control period increases the impact of a large gas release incident, especially if it were to occur in the final year of the price control period, effectively magnifying it by a factor of 8. The size and number of such incidents vary greatly from year to year and are outside the control of the network operator, usually being caused by a third party or member of the public. The emphasis of the rolling incentive mechanism is to promote enduring improvements in emissions reduction, the

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only element of reduction a network operator can influence is the quantity of reports, for example by raising industry awareness via advertising campaigns and initiatives, such as 'Dial Before You Dig', and through representation on industry bodies. If a reduced volume of gas was lost in the final year of RIIO-GD1, disproportionate to the volumes used when forming the baselines, this could significantly reward the network operator, and vice versa, an increase in volume of gas lost would unfairly penalise the operator, for this reason the uncontrolled volume cannot be considered to reflect an enduring impact.

The second Shipper representation suggested that using an average 8 year gas loss volume could be an appropriate methodology change; the GDNs believe this would be inappropriate as it would not reflect any improvement, or decline in performance in the latter years of the RIIO-GD1 period.

After careful consideration we therefore continue to propose that the leakage volume calculation in the Interference Damage methodology be amended so as to be based always on the numbers of incidents at the existing predefined leakage rates. This methodology change would be applicable only for the GDN determination of leakage for incentive performance, and not for the calculation of actual gas losses for cost allocation purposes, so not impacting unallocated gas calculations.

Views are again sought on the proposed revision to the methodology and associated revisions to baselines.

This consultation is on behalf of all GDNs and reflects the consolidated view of all parties.

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**Context**

Special Condition 1F of the GDN Licences sets out a number of obligations on Gas Distribution Networks (GDNs), including:

- maintenance of a Shrinkage and Leakage Model (SLM);
- annual review of the SLM;
- consultation on whether the Shrinkage and Leakage volume allowances should be revised in line with any proposed modification to the SLM.

**Associated Documents**

GDN Licences, Special Condition 1F

[RIIO-GD1 Final Proposals](#)

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## 1. Introduction

### 1.1 Background

The current leakage model makes an allowance for gas emissions associated with damage caused by interference on the gas supply system. The 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, it is used;
  - Where not, 500kg per incident is used.
- Other incidents<sup>1</sup>
  - Leakage is estimated by multiplying the number of incidents by fixed leakage rates and fixed response & repair times

It is reasonable to have an incentive to reduce the overall number of incidents occurring; this can be influenced by raising industry awareness via advertising campaigns and initiatives, such as 'Dial Before You Dig', and through representation on industry bodies. However, in any year there are a small number of large gas release incidents, which have a disproportionate impact on the total emissions. The number and size of such large incidents varies greatly from year to year.

The introduction of the rolling incentive mechanism for the RIIO-GD1 price control period increases the impact of a large gas release incident, especially if it were to occur in the final year of the price control period, as this would effectively multiply the impact by eight<sup>2</sup>. However, given that the size and number of such incidents vary greatly from year to year, the associated leakage volume in any particular year cannot be considered to reflect an enduring impact.

The issue of the Interference Damage calculation and, in particular, its impact in respect of the Shrinkage and Environmental Emissions incentives was raised with Ofgem during the RIIO-GD1 price control review; Ofgem made reference to this issue in the Final Proposals Supporting Document<sup>3</sup>:

"2.26. We recognise 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 and leakage) which addresses this issue whilst continuing to place the right incentives on companies to manage shrinkage and leakage."

Therefore, we propose that the leakage volume calculation in the Interference Damage methodology be amended so as to be based always on the numbers of incidents at the existing predefined leakage rates. This change would only be applicable for the purposes of determining incentive performance and would not affect gas loss calculations used for determining actual leakage, so not impacting unallocated gas.

We believe this will not require an external audit of the leakage model as all calculations within will remain the same; the only change is the manner in which we populate the data to form an outturn position for incentive purposes.

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<sup>1</sup> Mains incidents are split further between Low Pressure and Medium Pressure by application of fixed assumed proportions. Service incidents are split further between 'Punctured' and 'Severed' by application of fixed assumed proportions

<sup>2</sup> The eight year rolling incentive mechanism effectively deems the year 8 performance to be enduring and, mathematically, the total award/penalty available over the RIIO period is equal to eight times the final year's performance. Therefore, any non-enduring performance in this year, such as a large gas release incident, will erroneously be deemed as enduring and its impact will be eight times its annual volume.

<sup>3</sup> <https://www.ofgem.gov.uk/ofgem-publications/48155/2riiogd1fpoutputs incentivesdec12.pdf>

## 1.2 Process for Modification of The Shrinkage and Leakage Model

The requirements for the modification of The Shrinkage and Leakage Model (SLM) are set out within Special Condition 1F, Part E, of each GDN's licence. In summary, the requirements are:

- To review the SLM annually;
- To consult on the outcome of the SLM Review;
- Where modification of the SLM is then proposed the GDNs must specify the revised allowed Shrinkage and allowed Leakage volumes (baselines) so as to maintain the Shrinkage and Environmental Emissions incentives properties;
- For any proposed modification, the GDN must:
  - o Consult on whether the baselines should be revised as proposed;
  - o Following that consultation, submit a SLM Modification Report to Ofgem

## 1.3 Purpose of this Document

This document represents the fulfilment of the GDNs' Licence obligation to consult on modifications to the National Leakage Model and gives interested parties a chance to review and comment on the proposed modification contained within.

This document:

- explains our thoughts in relation to previous consultations and representations;
- specifies a proposed revision to the Interference Damage methodology for determination of incentive performance; and
- seeks views on whether the baselines should be revised as proposed.

This consultation is on behalf of all the GDNs and reflects the consolidated view of all parties.

## 1.4 Responding to this Document

Respondents' views are sought on all issues set out within this consultation but in particular on the following:

Q1. Do you agree that it is appropriate to amend the leakage volume calculation in the Interference Damage methodology, used for determining incentive performance, to be based always on the numbers of incidents at the existing predefined leakage rates?

Q2. Do you agree that the proposed revisions to the incentive baselines in Appendix A are appropriate?

Responses to this document should be directed to Matt Marshall or via the Joint Office (contact details below) by 5:00pm on 22 August 2018.

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## 2. Proposed Modifications to the SLM

### 2.1 Revision of the Interference Damage Calculation

The current leakage model makes an allowance for gas emissions associated with damage caused by interference on the gas supply system. The leakage model classifies these incidents in two different ways:

- i. Large incidents, i.e. those causing gas releases in excess of 500kg
  - (a) Where the actual volume of gas released has been estimated, it is used;
  - (b) Where not, 500kg per incident is used.
- ii. Other incidents
  - (a) Leakage is estimated by multiplying the number of incidents by fixed leakage rates and fixed response & repair times

For the purpose of determining incentive performance, the GDNs propose that the calculation of leakage in respect of large gas release incidents should be amended so as to be based always on the number of incidents at the existing pre-defined rates, i.e. it is proposed that option *i (a)* above is only valid for the determination of gas losses for cost allocation purposes.

This would still provide an incentive for GDNs to manage the number of incidents and, by leaving in the >500kg category, minimise the number of large incidents in particular, but without being exposed to the potential variation or incentive losses/windfall gains associated with actual leakage volume calculations which are out of their control. The determination of leakage for cost allocation purposes would remain unchanged, so having no impact on the calculation of unallocated gas.

#### 2.1.1. Impact of proposed leakage model changes

The Shrinkage and Environmental Emissions incentive baselines are contained within Appendix 2 and Appendix 3, respectively, of the RIIO-GD1 Licence Special Condition 1F.

In order to determine the impact of making the model change as outlined above, it is necessary to consider the assumptions underpinning the GDNs' specific RIIO-GD1 Leakage Baseline submissions:

- i. Cadent Gas Ltd

Cadent Gas Ltd based its RIIO-GD1 Leakage Baseline submissions on its 2010/11 leakage assessment, projecting forward to take account of the impact of mains replacement, which is a funded activity.

For Interference Damage, there were seventeen '>500kg' incidents identified, the leakage for two of which was estimated.

LDZ	Number >500kg	Specific		Original Leakage Calculation (GWh)	GWh/500Kg	Revised Leakage <sup>4</sup> (GWh)	Adjustment to Incentive Baselines
		Number	Leakage (kg)				
EA	4	0	0	0.0300	0.0075	0.0300	0.0000
EM	5	1	519	0.0378	0.0075	0.0376	-0.0003
NT	1	0	0	0.0075	0.0075	0.0075	0.0000
NW	1	0	0	0.0075	0.0075	0.0075	0.0000
WM	6	1	1,000	0.0523	0.0075	0.0449	-0.0075
	<b>17</b>	<b>2</b>	<b>1,519</b>	<b>0.1351</b>		<b>0.1274</b>	<b>-0.0078</b>

<sup>4</sup> Total Number of >500kg incidents x 'GWH/500kg' value

The incentive baselines are quoted to the nearest GWh and, therefore, there is no adjustment proposed for Cadent Gas Ltd's baselines as the largest adjustment is less than 0.01GWh.

ii. Northern Gas Networks

Northern Gas Networks based its RIIO-GD1 Leakage Baseline submissions on its 2010/11 leakage assessment, projecting forward to take account of the impact of mains replacement.

For Interference Damage, there were seven '>500kg' incidents identified, for each of these the actual leakage was estimated.

LDZ	Number >500kg	Specific		Original Leakage Calculation (GWh)	GWh/500Kg	Revised Leakage (GWh)	Adjustment to Incentive Baselines
		Number	Leakage (kg)				
NE	3	3	32,971	0.5042	0.0076	0.0229	-0.4813
NO	4	4	34,069	0.5200	0.0076	0.0305	-0.4895
	<b>7</b>	<b>7</b>	<b>67,040</b>	<b>1.0242</b>		<b>0.0534</b>	<b>-0.9708</b>

The incentive baselines are quoted to the nearest GWh. It is proposed Northern Gas Network baselines are adjusted by 1GWh to reflect interference damage impact.

iii. SGN

SGN based its RIIO-GD1 Leakage Baseline submissions on its 2010/11 leakage assessment, projecting forward to take account of the impact of mains replacement.

LDZ	Number >500kg	Specific		Original Leakage Calculation (GWh)	GWh/500Kg	Revised Leakage (GWh)	Adjustment to Incentive Baselines
		Number	Leakage (kg)				
SC	8	0	0	0.0608	0.0076	0.0608	0
SE	10	0	0	0.0744	0.0074	0.0744	0
SO	11	0	0	0.0821	0.0075	0.0821	0
	<b>29</b>	<b>0</b>	<b>0</b>	<b>0.2173</b>		<b>0.2173</b>	<b>0</b>

The incentive baselines are quoted to the nearest GWh and, therefore, there is no adjustment proposed for SGN's baselines.

iv. Wales and West Utilities

Wales and West Utilities based its RIIO-GD1 Leakage Baseline submissions on its 2010/11 leakage assessment, projecting forward to take account of the impact of mains replacement.

For Interference Damage, there were ten '>500kg' incidents identified, for each of these the actual leakage was not estimated.

LDZ	Number >500kg	Specific		Original Leakage Calculation (GWh)	GWh/500Kg	Revised Leakage (GWh)	Adjustment to Incentive Baselines
		Number	Leakage (kg)				
SW	8	0	0	0.0592	0.0074	0.0592	0
WN	1	0	0	0.0071	0.0071	0.0071	0
WS	1	0	0	0.0075	0.0075	0.0075	0
	<b>10</b>	<b>0</b>	<b>0</b>	<b>0.0738</b>		<b>0.0738</b>	<b>0</b>

The incentive baselines are quoted to the nearest GWh and, therefore, there is no adjustment proposed for Wales and West Utilities baselines.



## Appendix A Proposed Revision to Baselines

This section includes any revision to the Shrinkage and Leakage volume allowances as result of the proposed modification.

### A.1 Revised Baselines Values

The GDNs consider that if the proposed modifications to the SLM were to be implemented, it would be appropriate for the Shrinkage and Leakage baselines to be revised as set out in Tables A1 and A2 respectively.

The revised values reflect the impact of updating the Interference Damage methodology as outlined in this document. Where changes have been proposed to baselines, the original value is shown in brackets.

Table A1 Revised Shrinkage Volume Allowances

Network Owner	Network	Shrinkage Volume Allowance (GWh)							
		13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21
NGGD	EoE	569	515	503	490	479	467	455	444
	LN	317	282	274	266	259	252	245	238
	NW	407	378	367	356	346	334	324	314
	WM	335	323	316	310	302	295	289	281
NGN	NGN	459	445	433	423	411	401	389 <sub>(390)</sub>	378 <sub>(379)</sub>
SGN	SC	247	226	220	212	206	198	192	186
	SO	637	622	606	590	574	557	542	525
WWU	WWU	440	429.2	421.2	413.2	405.2	397.2	398.2	381.2

Table A2 Revised Leakage Volume Allowances

Network Owner	Network	Leakage Volume Allowance (GWh)							
		13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21
NGGD	EoE	535	482	470	458	447	435	423	412
	LN	299	264	257	249	242	235	228	222
	NW	385	356	346	335	324	313	303	293
	WM	320	309	303	296	289	282	276	268
NGN	NGN	434	420	408	398	385	376	363 <sub>(364)</sub>	353 <sub>(354)</sub>
SGN	SC	231	210	204	197	190	183	176	170
	SO	604	589	573	557	541	525	509	493
WWU	WWU	415	403.2	396.2	388.2	380.2	372.2	365.2	357.2

It is proposed that modifications to baselines will be applicable from 2019/20 onwards.