

Shrinkage and Leakage Model Consultation No. 04

**Proposed Revision of the Shrinkage and Leakage Volume Allowances in line
with the Proposed Modification of the Low Pressure Service Leakage
Calculations within the Shrinkage and Leakage Model**

Version 1.0

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Overview:

Gas Distribution Networks (GDNs) have proposed that the Low Pressure Service calculations for determining Leakage within the Shrinkage and Leakage Model (SLM) be modified.

The GDNs have an obligation under *Special Condition 1F Part E* of the GT Licences to consult on whether the Shrinkage and Leakage Volume Allowances should be revised in line with the proposed modification. Views are sought on the proposed revised Allowances.

As part of the establishment of a SLM, rather than the previous Leakage Model, the SLM needs to formally include the additional items in the Shrinkage calculation other than Leakage, namely the determination of Theft of Gas (ToG) and Own Use Gas (OUG) volumes in the existing manner. The changes to the model documentation to reflect this are set out.

This consultation is on behalf of all GDNs.

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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

The GDN Licences can be found on the Ofgem website; all other documents can be found on the Joint Office website.

GDN Licences, Special Condition 1F

Independent Review of Leakage Model Modification Consultation No.3	- GL Industrial Services UK Ltd
NGGD response SGN Leakage Model Consultation No. 3	- National Grid Gas Distribution Representation
Centrica response SGN Leakage Model Consultation No. 3	- British Gas Representation
Leakage Model Modification Consultation No.3 March 2012	- Scotia Gas Consultation
Leakage Model Modification Consultation No.2 February 2012	- National Grid Consultation
Independent Review of Leakage Model Modification Consultation No.2	- GL Industrial Services UK Ltd
Centrica response NGD Leakage model consultation 2	- British Gas Representation
Representation - Scotia Gas Networks LMMCons 2	- Scotia Gas Representation
Leakage Model Modification Draft Consultation	- National Grid Draft Consultation discussed at Shrinkage Forum held 6 January 2012
Minutes of the Shrinkage Forum held 6 January 2012	- Minutes of the meeting prepared by Joint Office
Leakage Model Modification Consultation No.1 March 2009	- Joint Distribution Consultation

Table of Contents

1.	Introduction	4
1.1	Background.....	4
1.2	Process for Modification of The Shrinkage and Leakage Model.....	4
1.3	Purpose of this Document	4
1.4	Responding to this Document	5
2.	Proposed Modifications to the SLM.....	6
2.1	Low Pressure Service Leakage.....	6
2.1.1.	Re-baseline to 2010/11 Service Populations	6
2.1.2.	Reflecting Service Transfer Activity.....	6
2.1.3.	Combined impact of proposed leakage model changes	7
2.2	Inclusion of Theft and Own Use Gas within the SLM.....	7
3.	Questions for Consultation	8
Appendix A	Proposed Revision to Baselines	9
A.1	Revised Baselines Values	9

1. Introduction

1.1 Background

In February 2012, National Grid Gas Distribution (NGGD) issued a consultation¹ proposing an update to the Leakage model for its Distribution Networks. The proposed changes to the model were to update the service population assumptions and to improve the modelling process such that the model better reflects the impact of service transfer activity. In March 2012, Scotia Gas Networks (SGN) issued a consultation² proposing equivalent modifications in respect of its Distribution Networks. The consultations proposed that these modifications should be implemented such that they took effect for the final two years of the GDPCR1 price control period.

Full details of these consultations including any representations, Independent Expert reports and final consultation reports can be found on the Joint Office website; <http://www.gasgovernance.co.uk/sf/leakage>.

The general conclusion of the consultations was that the proposed methodology changes represented an improvement to the leakage estimation process. However, concerns were expressed about the proposed timing of the changes and specifically the interaction with the finalisation of the RIIO-GD1 proposals. As a result, NGGD and SGN agreed not to proceed further with the change process at the time. Instead, it was agreed by all GDNs to pursue the change in Formula Year 2013/14 so that the proposed changes to the model might apply from 1 April 2013 and the linked changes to the Shrinkage and Leakage baseline volumes would apply to the RIIO-GD1 years.

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

It should be noted that the GDN licences now refer to a Shrinkage and Leakage Model (SLM) whereas the previous (pre-RIIO GD1) licences referred to a Leakage Model. The SLM therefore needs to specify the additional items that are included within the shrinkage calculation in addition to the leakage calculation.

1.3 Purpose of this Document

The Leakage model used by GDNs was previously reviewed. This review established that the Low Pressure Service calculations should be modified. This proposed modification has been discussed at the Shrinkage Forum and consulted on by two GDNs, with the proposed changes reviewed by an independent expert. The GDNs consider that the requirement to consult on the modification has therefore been met.

This document:

¹ [Leakage Model Modification Consultation No.2](#)

² [Leakage Model Modification Consultation No.3](#)

- specifies the revised Shrinkage and Environmental Emission baselines in line with the proposed modification; and
- seeks views on whether the baselines should be revised as proposed.

In line with the formal establishment of a Shrinkage and Leakage Model, this document also set out the proposed text to be included within the Shrinkage and Leakage Model documentation, so as to cover the additional items in the Shrinkage calculation other than Leakage, namely the determination of Theft of Gas (ToG) and Own Use Gas (OUG) volumes, in the existing manner.

This consultation is on behalf of all the GDNs.

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. If the SLM is modified in the manner set out in Section 2.1, should the allowed Shrinkage and Leakage volumes be revised as set out in Tables A1 and A2 respectively?

Q2. Is it appropriate to include the proposed text set out in Section 2.2 so that the SLM reflects the existing processes for determining Theft of Gas and Own Use Gas volumes within Shrinkage?

Responses to this document should be received, via the Joint Office, no later than 27 August 2013.

2. Proposed Modifications to the SLM

2.1 Low Pressure Service Leakage

This modification has been proposed because the current leakage model does not correctly account for the impact of service replacement that has taken place since the original model assumptions were established.

The proposal is to use recent mains and service replacement data to estimate the current service populations. In 2009, the leakage model was updated to reflect the impact of re-laying steel services. This proposal recommends that the impact of transferring plastic services to be taken into account in the leakage estimation.

A full description of the proposed changes and hypothetical worked examples can be found in the [original consultation document](#).

2.1.1. Re-baseline to 2010/11 Service Populations

The first modification to the low pressure service calculation is to establish a current estimate of the population of the four service type categories³. The impact of this modification has been estimated by calculating the difference between the original leakage model (v1.3) output and that for the revised model (v1.4) for the 2010/11 leakage assessment. This impact is a one-off change; however, as the Incentive baselines within the Licence have been estimated on the original v1.3 leakage model, this adjustment must to be applied to each year.

The adjustments to be applied in respect of the re-baselining of the service populations are shown in the table below⁴:

Network	LDZ	Adjustment to RIIO Incentive Baselines (GWh)							
		13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21
EoE	EA	-16.0	-16.0	-16.0	-16.0	-16.0	-16.0	-16.0	-16.0
	EM	-24.4	-24.4	-24.4	-24.4	-24.4	-24.4	-24.4	-24.4
LN	NT	-27.4	-27.4	-27.4	-27.4	-27.4	-27.4	-27.4	-27.4
NW	NW	-17.3	-17.3	-17.3	-17.3	-17.3	-17.3	-17.3	-17.3
WM	WM	-3.6	-3.6	-3.6	-3.6	-3.6	-3.6	-3.6	-3.6
NGN	NE	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	NO	-3.5	-3.5	-3.5	-3.5	-3.5	-3.5	-3.5	-3.5
SC	SC	-12.3	-12.3	-12.3	-12.3	-12.3	-12.3	-12.3	-12.3
SO	SE	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
	SO	-4.5	-4.5	-4.5	-4.5	-4.5	-4.5	-4.5	-4.5
WWU	SW	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
	WN	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7
	WS	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2

2.1.2. Reflecting Service Transfer Activity

The second modification to the low pressure service calculation is to reflect the leakage reduction associated with service transfer activity. A 'service transfer' occurs when, during the replacement of a metallic main, an existing PE service is transferred to the new PE main. In the leakage model, a PE service connection to a metallic main has an associated leakage rate, whereas a PE connection to a PE main has a zero leakage rate⁵.

The impact on incentive baselines of taking account of service transfers depends on the length of mains replacement carried out. Therefore, it is necessary to estimate this in order to

³ The original estimate of service populations was established in the early 1990s.

⁴ The adjustments in respect of EA and NT LDZs differ from those published in the consultation because, for leakage purposes, in the previous price control period the Outer Metropolitan area of London was considered in North Thames LDZ whereas it is now considered to be in Eastern LDZ. Therefore, the impact of the model change is 4GWh higher in EA and 4GWh lower in NT.

⁵ The service leakage rates currently in use were established in the 2002/03 National Leakage Test programme.

establish the incentive baseline adjustments. In addition, the anticipated year-on-year reduction will be cumulative starting from 2011/12, i.e. the first year after the re-baselining of the service populations; 2013/14's adjustment will reflect the impact of three years mains replacement etc.

The adjustments to be applied in respect of correctly reflecting service transfers within the leakage model are shown in the table below:

Network	LDZ	1-year adj. 11/12	Adjustment to RIIO Incentive Baselines (GWh)							
			13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21
EoE	EA	-0.3	-0.9	-1.2	-1.5	-1.8	-2.1	-2.4	-2.7	-3.0
	EM	-0.4	-1.2	-1.6	-2.0	-2.4	-2.8	-3.2	-3.6	-4.0
LN	NT	-0.2	-0.6	-0.8	-1.0	-1.2	-1.4	-1.6	-1.8	-2.0
NW	NW	-0.4	-1.2	-1.6	-2.0	-2.4	-2.8	-3.2	-3.6	-4.0
WM	WM	-0.3	-0.9	-1.2	-1.5	-1.8	-2.1	-2.4	-2.7	-3.0
NO	NE	-0.3	-0.9	-1.2	-1.5	-1.8	-2.1	-2.4	-2.7	-3.0
	NO	-0.2	-0.6	-0.8	-1.0	-1.2	-1.4	-1.6	-1.8	-2.0
SC	SC	-0.4	-1.1	-1.4	-1.8	-2.2	-2.5	-2.9	-3.2	-3.6
SO	SE	-0.3	-0.8	-1.0	-1.3	-1.6	-1.8	-2.1	-2.3	-2.6
	SO	-0.2	-0.5	-0.7	-0.9	-1.0	-1.2	-1.4	-1.5	-1.7
W&W	SW	-0.2	-0.7	-0.9	-1.2	-1.4	-1.6	-1.8	-2.1	-2.3
	WN	-0.0	-0.1	-0.2	-0.2	-0.3	-0.3	-0.4	-0.4	-0.4
	WS	-0.1	-0.4	-0.6	-0.7	-0.8	-1.0	-1.1	-1.2	-1.4

2.1.3. Combined 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. The baselines are provided for each Distribution Network to the nearest GWh. The adjustments, from the tables above, aggregated to a DN level and rounded to the nearest GWh are shown in the table below:

Network Owner	Network	Adjustment to RIIO Incentive Baselines (GWh)							
		13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21
NGGD	EoE	-43	-43	-44	-45	-45	-46	-47	-47
	LN	-28	-28	-28	-29	-29	-29	-29	-29
	NW	-19	-19	-19	-20	-20	-21	-21	-21
	WM	-5	-5	-5	-5	-6	-6	-6	-7
NGN	NGN	-4	-4	-5	-5	-6	-6	-7	-7
SGN	SC	-13	-14	-14	-14	-15	-15	-16	-16
	SO	1	0	0	-1	-1	-1	-2	-2
WWU	WWU	-9	-10	-10	-10	-11	-11	-12	-12

2.2 Inclusion of Theft and Own Use Gas within the SLM

For the RIIO-GD1 Price Control period, the controls that were in place in respect of the Leakage model during the GDPCR1 Price Control period have been expanded to cover Shrinkage. Therefore, it is necessary to expand the documentation defining the Shrinkage and Leakage Model to include Theft and Own Use Gas.

The proposed text for inclusion within the Shrinkage and Leakage Model Documentation is given below:

- Theft of Gas

“This represents the overall level of Transporter Responsible theft, as defined in UNC Section N1.3.2, and is calculated as 0.02% of throughput.”

- Own Use Gas

“This represents the overall level of gas used by the GDN for purposes of pre-heating at pressure reduction installations and is calculated as 0.0113% of throughput.”

3. Questions for Consultation

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

Q1. If the SLM is modified in the manner set out in Section 2.1, should the allowed Shrinkage and Leakage volumes be revised as set out in Tables A1 and A2 respectively?

Q2. Is it appropriate to include the proposed text set out in Section 2.2 so that the SLM reflects the existing processes for determining Theft of Gas and Own Use Gas volumes within Shrinkage?

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 derivation of these values can be found in section 2.1 of this document. The revised values reflect the actual impact of updating the current service population assumptions and an estimated impact of reflecting service transfer activity within the leakage model, as outlined in the previous modification consultation by NGGD.

The Independent Expert's reports on the previous NGGD and SGN proposed modifications to the Leakage Model confirmed that the adjustments to the then existing baselines, calculated in the same manner as the adjustments underlying these revised baselines, had been calculated correctly and in accordance with the proposed methodology.

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	526	515	503	490	479	467	455	444
	LN	289	282	274	266	259	252	245	238
	NW	388	378	367	356	346	334	324	314
	WM	330	323	316	310	302	295	289	281
NGN	NGN	455	445	433	423	412	401	390	379
SGN	SC	234	226	220	212	206	198	192	186
	SO	638	622	606	590	574	557	542	525
WWU	WWU	431	423	415	407	398	390	381	373

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	492	482	470	458	447	435	423	412
	LN	271	264	257	249	242	235	228	222
	NW	366	356	346	335	324	313	303	293
	WM	315	309	303	296	289	282	276	268
NGN	NGN	430	420	408	398	386	376	364	354
SGN	SC	218	210	204	197	190	183	176	170
	SO	605	589	573	557	541	525	509	493
WWU	WWU	406	397	390	382	373	365	357	349