Northern Gas Networks

Asset Risk Management

Shrinkage Adjustments for Gas Year

2016-2017

Northern Gas Networks

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1.0 Executive Summary

This document provides information to shippers on the following:

- Assessment of North and North East LDZ Shrinkage Quantities
- Northern Gas Networks LDZ Shrinkage Adjustment
- Financial Adjustments applicable to Northern Gas Networks

Assessment of North and North East LDZ Shrinkage Quantity

In accordance with Uniform Network Code Section N3.3.3 the following information provides an assessment of shrinkage for both North and North Eastern LDZs. Northern Gas Networks final proposals for the Gas Year 2016/17 was not subject to Condition 7(4) disapproval and as a result, the proposed LDZ Shrinkage Quantities were applied in accordance with *Uniform Network Code TPD +Section N 3.1.8*.

Table 1.1 - LDZ Final Proposal Shrinkage Quantity for the period 1st April 2016 to 31st March 2017

LDZ	Shrinkage Quantity (GWh)
North	165.18
North East	198.99
NGN Total	364.17

The assessment of shrinkage quantity for North and North East LDZs for the period 1st April 2016 to 31st March 2017 is approximately **10.18** GWh lower than the amount of shrinkage identified for that period, based on the above quantities.

Northern Gas Networks LDZ Shrinkage Adjustment

This section advises Shippers of the Shrinkage Adjustment for North and North East LDZ's for the period 1st April 2016 to 31st March 2017 as referred to in *Uniform Network Code TPD Section N 3.4.1.*

Using the applied and assessed shrinkage factors the following shrinkage quantities were calculated for the period 1st April 2016 to 31st March 2017

Table 1.2 - LDZ Shrinkage Reconciliation for the period 1st April 2016 to 31st March 2017

LDZ	Assessed LDZ Shrinkage Quantity (kWh)	Procured LDZ Shrinkage Quantity (kWh)	LDZ Shrinkage Reconciliation Quantity (kWh)
North	161,172,797	165,177,788	-4,004,991
North East	192,813,602	198,990,430	-6,176,828
NGN Total	353,986,400	364,168,218	-10,181,818

Note: Negative values indicate an over procurement.

2.0 Financial Adjustments Applicable to Northern Gas Networks

In accordance with the *LDZ Shrinkage Adjustments Methodology Version 2.0* there are two elements of financial adjustment. These are:

- Financial Adjustment for shrinkage energy reconciliation
- Financial Adjustment required for commodity charge reconciliation

Both of these financial elements are determined in the following sections.

2.1 Financial Adjustment for Shrinkage Energy Reconciliation

Applying the algorithm in section 2.2 of *LDZ Shrinkage Adjustments Methodology Version 2.0* the following financial adjustment has been determined for Northern Gas Networks for the period 1st April 2016 to 31st March 2017

Table 2.10 – Financial Adjustment (Gas Reconciliation)

LDZ	LDZ Shrinkage Reconciliation Quantity (kWh)	Adjustment Value
North	-4,004,991	-£52,895.91
North East	-6,176,828	-£81,580.44
NGN Total	-10,181,818	-£134,476.35

The Northern Gas Networks total financial adjustment of £**134,476.35** is negative and therefore identified as a credit to the Gas Transporters.

2.2 Financial Adjustment required for Commodity Charge Reconciliation

Applying the algorithm in section 2.3 of *LDZ Shrinkage Adjustments Methodology Version 2.0*, the following financial adjustment has been determined for Northern Gas networks for the period 1st April 2016 to 31st March 2017

Table 2.20 – Financial Adjustment (Transportation Commodity Reconciliation)

LDZ	LDZ Shrinkage Reconciliation Quantity (kWh)	Adjustment Value
North	-4,004,991	-£2,717.55
North East	-6,176,828	-£4,191.22
NGN Total	-10,181,818	-£6,908.77

The Northern Gas Networks total financial commodity charge adjustment of £**6,908.77** is negative and therefore identified as a credit to the Gas Transporters.

Northern Gas Networks Total Financial Adjustment is therefore £141,385.12

2.3 Transportation Commodity Charges

The commodity charges used in the Transportation Commodity Reconciliation calculations are:

Table 2.30 –Transportation Commodity Charges

	Period of Application		
	01/04/16 to 30/09/16	01/10/16 to 31/03/2017	
NTS Commodity	**0.00037**	**0.000341**	
LDZ Commodity	**0.000323**	**0.000323**	
Total Commodity Rate	**0.000693**	**0.000664**	

Note: The above figures are in pound per Kwh whilst the figures taken from the charging Statements are in pence per Kwh.

3. Operational Usage (Own Use Gas)

Operational Usage, also known as Own Use Gas (OUG), is gas used within the LDZ for such purposes as pre-heater fuel to counter the impact of the Joule-Thompson effect and for other minor operational purposes.

Pre-heater fuel is the largest component of OUG and has always been determined using the output from a model that utilises the thermodynamic principles of the Joule-Thompson effect and gas volume, calorific value, pressure and temperature data. The currently accepted factor is based on a model developed by GL Noble Denton, which has been shared with the User community through the Shrinkage Forum.

For the purposes of assessment in respect of the 2016/17 Gas Year, no better information (meter readings) or calculation for actual OUG was available; therefore, the proposed factor of 0.0113% of consumption, based on the GL Noble Denton model was used.

LDZ	Consumption 2016/17 (GWh)	Applied OUG Factor 2016/17	Daily OUG Quantity (kWh)
North	32,410,272	0.0113%	10,034
North East	37,907,801		11,736
NGN	70,318,073		21,770

Table 3.1 - Assessment of OUG

4. Theft of Gas

Uniform Network Code Section N1.3.2 states that “LDZ Shrinkage shall include gas lost through theft either upstream of the customer control valve or downstream where there is no shipper serving the gas consumer”.

In respect of the 2016/17 Gas Year, a National Factor of 0.02% of throughput was applied.

LDZ	Consumption 2016/17 (GWh)	Applied ToG Factor 2016/17	Daily ToG Quantity (kWh)
North	32,410,272	0.020%	17,759
North East	37,907,801		20,771
NGN	70,318,073		38,530

Table 4.1 - Assessment of ToG

This report is based on data sourced from the Shrinkage and Leakage Model (SLM) Version 1.4 which was approved by Ofgem in September 2014 (modification to low pressure service calculations)

Because of the number of decimal places within the formula in the Shrinkage & Leakage Model (SLM), the rounding differences may result in immaterial changes to the overall values.

Appendix A - LDZ Shrinkage Adjustment Methodology Version 2 (2009)

1. Introduction

The purpose of this document is to define how LDZ shrinkage will be reconciled after the End of the relevant period as defined by the Transporters and how the costs shall be Distributed. The relevant period may be less than 12 months, but shall be for a period of Consistent Daily Shrinkage Quantity. This document does not form part of the Uniform Network Code (UNC).

1. Reconciliation Methodology

The following is designed to reconcile the purchased LDZ shrinkage quantities at the end Of the relevant period against those calculated following the assessment applicable to that Relevant period, in accordance with *UNC – Transportation Principal Document Section N3.3*, and ensure that the reconciliation by difference (RbD) billing process is adjusted Accordingly.
A negative 'adjustment', in the calculations below, indicates an over procurement and, hence, a credit to the Gas Transporter; a positive 'adjustment' indicates an under Procurement and, hence, a credit to Shippers.

1.1 Reconciliation Quantity

After the end of the relevant period, the Daily LDZ shrinkage reconciliation quantity Shall be calculated as follows:

$$\boldsymbol{SLRQ = (SLAQ - SLPQ)}$$

Where *SLRQ* = Reconciliation LDZ specific Daily Shrinkage Quantity (kWh)
SLAQ = Assessed LDZ specific Daily Shrinkage Quantity (kWh)
SLPQ = Procured LDZ specific Daily Shrinkage Quantity (kWh)

1.2 Financial Adjustment (Gas Reconciliation)

The financial adjustment associated with gas reconciliation (*FARec*) shall be calculated, on a daily LDZ basis, as follows:

$$FA(£) = \sum^{AllDays} \left(S_{LRQ} \times SAP / 100 \right)$$

Where *FARec* = Financial Adjustment associated with Gas Reconciliation (£)
SAP = Daily System Average Price (p/kWh)
All days = Sum for all days in the relevant period

1.3 Financial Adjustment (Transportation Commodity Reconciliation)

The financial adjustment associated with transportation commodity reconciliation shall be calculated individually for each of the Commodity Charge elements on a daily LDZ basis, as follows:

$$FA_{com} = \sum_{1}^{n} \left(\sum_{Pstart}^{Pend} (S_{LRQ}) \times CC_n / 100 \right)$$

Where *FAComm* = Financial adjustment associated with transportation Commodity reconciliation (£)
n = Number of charging periods
Pstart = Start date of the charging period
Pend = End date of the charging period
CCn = Applicable Commodity Charge for the specific Commodity Charge element and charging period
1= NTS Commodity and System Commodity

2. Billing

The financial adjustments identified in Section 2, above, shall be allocated between Shippers in proportion to their share of the Aggregate LDZ AQ for the relevant period, subdivided into periods of consistent transportation charging, and shall be compiled into a single set of energy and network operator invoices or rebates.