LDZ SHRINKAGE ASSESSMENT

FOR GAS YEAR 2005/06

Scotia Gas Networks

March 2007

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1 Executive Summary

The purpose of this document is to present an assessment of LDZ Shrinkage for the Gas Year 2005/06, in accordance with *Uniform Network Code Section N 3.3.3*.

Scotia Gas Network's final LDZ Shrinkage Factor proposal for the Gas Year 2005/06, issued 1 September 2005, proposed individual LDZ Shrinkage Factors of 0.54%, 0.67% and 0.78% of LDZ throughput for the Scotland, South-East and Southern LDZs respectively. The final proposal for the Gas Year 2005/06 was not subject to Condition A11(18) disapproval and as a result, the proposed LDZ Shrinkage Factors were applied in accordance with *Uniform Network Code Section N 3.1.8*.

LDZ Shrinkage Factors are comprised of three main components:

- Leakage with factors applied at LDZ level
- Operational Usage with a factor applied at a national level
- Transporter responsible Theft of Gas with a factor applied at a national level

The LDZ Shrinkage Factors proposed for the Gas Year 2005/06 were derived using the methodology and data sources as stated in the proposal document. Table 1 shows the date range for the information used as the basis of the proposed and assessed factors for the Gas Year 2005/06;

Table 1. Date Range of Data Used for LDZ Shrinkage Factor Proposal and Assessment 2005/06

LDZ Shrinkage Component	Basis of Proposed LDZ Shrinkage Factor 2005/06	Basis of Assessed LDZ Shrinkage Factor 2005/06
Leakage	Assessment of actual leakage for the calendar year 2004	Assessment of leakage for the calendar year 2005[1]
Operational Usage	Compromise between current own use gas model and Advantica model	Advantica model following its verification
Theft of Gas	15th August 2005 Transporters proposal to Shrinkage Forum	15th August 2005 Transporters proposal to Shrinkage Forum

The assessment of LDZ Shrinkage for the Gas Year 2005/06 detailed within this document provides, where applicable, reasons for significant variance between the estimated and the assessed LDZ Shrinkage Factors for the period.

Expressed as energy, the assessment of LDZ Shrinkage for 2005/06 is approximately 66.3 GWh lower than the amount of Shrinkage purchased for the Gas Year 2005/06.

The main reason for this difference is a decrease in Own Use Gas energy of 42.1 GWh, from 62.2 GWh to 20.1 GWh. Additionally a decrease in leakage energy accounts for a fall of 24.2 GWh, from 1,066.3 GWh to 1,042.1 GWh.

[1] For the purposes of the Assessment process, the assessment of Leakage has been restricted to changes in Average System Pressure, in accordance with the agreement at the LDZ Shrinkage Forum held 8 June 2004 at Buckingham Gate.

2 LDZ Shrinkage Factor Assessment

This section of the report provides a detailed breakdown of the assessment for SGN's individual LDZ's during the Gas Year 2005/06.

2.1 Leakage

For the Gas Year 2005/06, LDZ specific Shrinkage Factors were proposed based on overall leakage energy of 1,066 GWh. This was based on an assessment of leakage for the calendar year 2004.

2.1.1 Assessment of 2005/06 Leakage

The assessment of leakage for the Gas Year 2005/06 applied the same methodology as used to derive Scotia Gas Network's original estimate of leakage (all categories) of 1,066 GWh for that year. In accordance with the agreement established at the LDZ Shrinkage Forum held 8 June 2004, the leakage applicable to the 2005/06 Gas Year Assessment has been calculated such that it reflects changes to Average System Pressure only with all other inputs being those used for the 2004 Leakage Assessment, i.e. that used to derive the 2005/06 Gas Year applied Shrinkage Factors.

Estimated and assessed leakage quantities for each LDZ are shown in Table 2;

Table 2. Estimated and Assessed Leakage Energy and Leakage Factors by LDZ

LDZ	Sum of Estimated Leakage Energy GWh	Sum of Assessed Leakage Energy GWh
SC	285.7	283.9
SE	448.6	446.0
SO	332.1	312.2
Total	**1,066.3**	**1,042.1**

As shown in Table 2, the assessment of leakage has resulted in a decrease in leakage energy of approximately 24.2 GWh.

2.2 Operational Usage

Operational Usage is gas, also known as Own Use Gas (OUG), 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, e.g. venting.

Pre-heater fuel is the largest component of OUG and it is determined using the output from a model that utilises the thermodynamic principles of the Joule-Thompson effect and LDZ throughput, calorific value, pressure and temperature data.

The final proposed 2005/06 OUG factor of 0.035%, for all GDNs, was set as a compromise factor. It was widely recognised that the OUG factor of 0.06% (used in 2004/05) was too high and it became apparent that an alternative OUG model had been developed by Advantica (commissioned by Transco in 2002), which had the aim of overcoming the known shortcomings of the then current model.

GDNs thus proposed, at the Shrinkage Forum on 15th August 2005, to use the LDZ OUG factors (which combine to a national average of 0.0113%) from the Advantica model, as published in the May 2002 Advantica report 'Own Use Gas Model for Pre-Heaters'.

Objections were raised to using these LDZ OUG factors as some users believed that this report did not offer sufficiently robust evidence to justify an OUG factor of 0.0113%. So a compromise of 0.035% was reached. However Advantica subsequently reviewed the model, as presented to the Shrinkage Forum on June 22nd 2006. This verified the robustness of the model.

This verification shows that the OUG factor should indeed have been set at 0.0113% (National average) for 2005/06. The adjustment process is the appropriate means to make a correction for an incorrect OUG factor being proposed for 2005/06.

Estimated and assessed OUG quantities for each LDZ are shown in Table 3;

Table 3. Estimated and Assessed OUG Energy and OUG Factors by LDZ

LDZ	Sum of Estimated OUG Energy GWh	Sum of Assessed OUG Energy GWh
SC	20.6	6.7
SE	25.5	8.2
SO	16.0	5.2
Total	**62.2**	**20.1**

As shown in table 3, the assessment of leakage has resulted in a decrease in OUG energy of approximately 42.1 GWh.

2.3 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.

Unidentified theft was estimated to be 0.02% of throughput for 2005/06. The assessed figure remains the same. The quantification of the level of theft and proportion attributable to Transporters is under review – both in the Shrinkage Gas Forum and Theft of Gas Forum.

2.4 LDZ Specific Shrinkage Factors

Scotia Gas Networks made their final LDZ specific Shrinkage Factors proposal for the Gas Year 2005/06 in September 2005. Scotia Gas Network's proposal was not subject to Ofgem disapproval under Licence Condition A11(18) disapproval, with the proposed LDZ specific Shrinkage Factors being applied with effect from the 1 October 2005. The proposed/applied LDZ Shrinkage Factors are shown in Table 4 below, along with the assessed LDZ specific Shrinkage Factors for 2005/06 produced in the method detailed within this document.

Table 4. LDZ Specific Shrinkage Factors

LDZ	Applied Shrinkage Factor 2005/06	Assessed Shrinkage Factor 2005/06	*Difference Between Assessed & Applied Factors*
Scotland	0.54%	0.5131%	-0.0269%
SE	0.67%	0.6428%	-0.0272%
Southern	0.78%	0.7130%	-0.0670%

Note: i) Shrinkage Factors are expressed as a percentage of LDZ throughput and should be considered in context with the actual throughput number used to derive them.

2.4.1 Reasons for Differences

The difference between Scotia Gas Network's estimated and assessed LDZ Shrinkage Factors, as displayed in table 4, is due to falls decreases in OUG and, to a lesser extent, leakage energy. Please refer to section one (page 1) for further details.