



**LDZ SHRINKAGE ASSESSMENT  
FOR GAS YEAR 2006/2007**

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## LDZ Shrinkage Assessment for the Gas Year 2006/2007

### 1 Executive Summary

The purpose of this document is to present the Wales & West Utilities element of the assessment of LDZ Shrinkage for the Gas Year 2006/2007, in accordance with *Uniform Network Code Section N 3.3.3*. This assessment covers the gas year 2006/2007 consisting of the months of October 2006 through to September 2007.

WWU's final LDZ Shrinkage Factor proposal for the Gas Year 2006/2007 was not subject to Condition 7(4) 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 2006/2007 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 2006/2007:

**Table 1. Date Range of Data Used for LDZ Shrinkage Factor Proposal and Assessment 2006/2007**

| <b>LDZ Shrinkage Component</b> | <b>Basis of Proposed LDZ Shrinkage Factor 2006/2007</b>  | <b>Basis of Assessed LDZ Shrinkage Factor 2006/2007</b> |
|--------------------------------|--|---|
| <b>Leakage</b>                 | Assessment of actual leakage for the calendar year 2005. | Assessment of leakage for the calendar year 2006.       |
| <b>Operational Usage</b>       | Assessment for the calendar year 2005.                   | Assessment for the Gas Year 2006/2007.                  |
| <b>Theft of Gas</b>            | Assessment for the calendar year 2005.                   | Assessment for the Gas Year 2006/2007.                  |

Expressed as energy, the assessment of LDZ Shrinkage covering the months of October 2006 through to September 2007 is 7 GWh higher than the amount of Shrinkage purchased for the Gas Year 2006/2007.

### 2 LDZ Shrinkage Factor Assessment

This section of the report provides a detailed breakdown of the assessment for the period 1 October 2006 – 30 September 2007.

#### 2.1 Leakage

For the Gas Year 2006/2007, LDZ specific Shrinkage Factors were based on an assessment of leakage for the calendar year 2005 derived from the Network Leakage Reduction Monitoring Model (NLRMM). The NLRMM utilises the following information:

- Leakage rates
- Asset profile information for both mains/service from Systems, Applications and Products in Data Processing (SAP)
- An assessment of network pressures within LDZs
- An assessment of the level of gas conditioning using Monoethylene Glycol (MEG) applied to the cast iron mains containing lead yarn joints

### 2.1.1 Assessment of 2006/2007 Leakage

In accordance with the agreement established at the LDZ Shrinkage Forum held 8 June 2004, the leakage applicable to the 2006/07 Gas Year Assessment has been calculated such that it reflects changes to Average System Pressure. All other inputs being those used for the 2005 Leakage Assessment, i.e. those used to derive the 2006/07 Gas Year applied Shrinkage Factors. LDZ specific Flow Weighted Average Calorific Values (FWACV) are applied to convert the NLRMM output from a volume to an energy value.

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**

| <b>LDZ</b>         | <b>2006/2007 Assessed Energy (GWh)</b> | <b>2006/2007 Estimated Energy (GWh)</b> |
|--------------------|--|---|
| <b>South West</b>  | 323                                    | 340                                     |
| <b>Wales North</b> | 69                                     | 69                                      |
| <b>Wales South</b> | 175                                    | 147                                     |
| <b>Total</b>       | <b>567</b>                             | <b>555</b>                              |

As shown in Table 2, the assessment of leakage has resulted in an increase in energy of 12 GWh.

Analysis of LDZ specific changes were detailed in Wales & West Utilities LDZ Shrinkage Factors Final Estimates Gas Year 2006/7, issued 31 August 2006, which also compared 2005 leakage data with 2004 leakage data.

### 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 Operational Usage has been assessed for the Gas Year 2006/07 using 0.0113% of LDZ throughput which is equivalent to 9.1 GWh.

### 2.3 Theft of Gas

*Uniform Network Code Section N1.4.2* 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 0.2% of throughput for 2006/2007, of which 10% was deemed to be the Transporter's responsibility. The best information available to the gas Transporters is supportive of the assumed level and proportions of Theft of Gas and as such, Wales and West Utilities do not believe that it should revise its assessment of theft of gas from 0.02% of LDZ throughput.

## 2.4 LDZ Specific Shrinkage Factors

Applied and assessed LDZ shrinkage factors are shown in table 3

**Table 3 LDZ Specific Shrinkage Factors**

| <b>LDZ</b>         | <b>Applied Factors 2006/07 (%)</b> | <b>Assessed Shrinkage Factors 2006/07 (%)</b> | <b>Difference Between Assessed &amp; Applied Factors (%)</b> |
|--------------------|------------------------------------|---|--|
| <b>South West</b>  | 0.92                               | 0.8739  | -0.0461  |
| <b>Wales North</b> | 0.80                               | 0.7984  | -0.0016  |
| <b>Wales South</b> | 0.48                               | 0.5590  | 0.0790   |

**Note:** Shrinkage Factors are expressed as a percentage of LDZ throughput.

### 2.4.1 Reasons for Differences

Better control of the profile electronic controls in the South West has led to a reduction in average system pressure and hence leakage.

The main reason for the increase in leakage in Wales South LDZ was the instability of the Closed Loop central computer which has now been replaced. During 2006, this instability led to a number of system failures. When the control system fails the pressure management equipment on site operates in safe mode at an elevated pressure. Such failures during 2006 had an impact on the Average System Pressure which has resulted in an increase in comparison to previous years.