LDZ Energy Loss
Initial Proposals
Financial Year 2012/13

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1 LDZ Energy Loss Proposals for Formula Year 2012/13

1.1 Purpose of Proposal

The purpose of this paper is to present Wales & West Utilities' proposals in respect of LDZ Energy Loss for the Formula Year 2012/13 as required under section N of the Uniform Network Code.

In section N of UNC, the Transporter has an obligation to set the LDZ Energy Loss to provide for the gas that is used by each of its LDZs or lost from its systems.

Following representations from Users, a further paper will be issued by 1 March 2012 in which WWU will set out its final estimate of the Energy Loss for Wales North, Wales South and South West LDZs.

1.2 Summary of Proposal

The LDZ Energy Loss, which is set out in the following table, reflects the losses associated with leakage, theft of gas and gas used in the operation of the system. Details of how these factors have been determined are included in this paper. The structure of the paper follows the format of a UNC Modification Report.

Fugitive emissions of gas have been calculated on an LDZ basis. Theft of gas, and gas used in the operation of the system, has been calculated using previous defined methodology. The calculations used to derive the Energy Loss and a summary of the underlying information are set out in this proposal.

The Energy Loss is to be used as the basis for WWUs' LDZ shrinkage gas procurement during the 2012/13 Formula Year.

LDZ	**Proposed Energy Loss (GWh)**	**Proposed Energy Loss Factor** 2012/13 **(Note)**
Wales North	56.8	0.774
Wales South	140.1	0.337
South West	250.6	0.802
Total	**447.4**	**0.558**

Note: The Energy Loss shown in the table are expressed as a percentage of LDZ consumption.

1.3 Component Analysis

This section of the document presents an analysis of the components of LDZ shrinkage that make up the estimates for the Formula Year 2012/13 proposal.

1.3.1 Leakage

Leakage represents the largest component of the LDZ Energy Loss.

For the purpose of analysis, leakage is split into three categories which are:

- Distribution Mains (including service pipes);
- Above Ground Installations (AGI's); and,
- Other losses.

Distribution mains and service leakage is a feature of normal system operation.

AGI leakage includes the routine venting of control equipment.

Other losses include gas lost as a result of interference damage and broken mains. These losses are not continuous; they are caused by specific events.

1.3.2 Distribution Mains (and Services) Leakage

The leakage of gas from the Distribution mains system (which includes service pipe leakage) is calculated by applying the results of the 2002/3 National Leakage Testing programme to the following network[1] specific information:

- Projected (Formula year end 2012/13) records of pipe asset;
- The annual average system pressure in each network[1] for financial year 2010/11; and,
- The measured concentration of Monoethylene Glycol (MEG) joint treatment chemical in the gas.

Where applicable (i.e. cast iron mains only) the Pipe Leakage Factors are adjusted to take into account the measured concentration of MEG.

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[1] Network in this context relates to physical interconnected pipe systems, not administrative structure.

The table below shows the Low Pressure leakage on an LDZ basis

LDZ	Low Pressure Leakage
	GWh
Wales North	27.2
Wales South	93.2
South West	187.6
Total	**308.0**

The table below shows the Medium Pressure leakage on an LDZ basis

LDZ	Medium Pressure Leakage
	GWh
Wales North	3.5
Wales South	10.2
South West	20.8
Total	**34.5**

1.3.3 AGI Emissions

The figures for leakage from Above Ground Installations have been taken from the findings of the 2003 Above Ground Installation Leakage Test programme.

The table below shows AGI Leakage on an LDZ basis

LDZ	AGI Emissions[2]
	GWh
Wales North	23.6
Wales South	23.6
South West	31.7
Total	**78.9**

[2] Includes leakage and routine equipment venting

1.3.4 Other Losses

Gas may be lost from LDZ equipment as a result of specific events, namely broken mains and interference damage to plant, in addition to ongoing leakage. These losses are known collectively as “other losses”.

Statistics in respect of the number of broken mains and damages are used in conjunction with calculations on the amount of gas lost through each type of incident to derive the total amount of gas lost as a result of these events. (For the purpose of this paper the numbers of events in 2010/11 have been used for the analysis).

The table below shows the amount of gas lost as a result of other losses for the WWU LDZs.

LDZ	GWh
Wales North	0.16
Wales South	0.20
South West	0.77
Total	**1.13**

1.3.5 Total Leakage

The table below shows the total amount of predicted leakage for Formula Year 2012/13 on an LDZ basis with the leakage expressed in GWh and as a percentage of LDZ consumption.

LDZ	Leakage	
	GWh	Leakage as a % of Consumption
Wales North	54.48	0.743
Wales South	127.19	0.306
South West	240.87	0.771
Total / Weighted Average	**422.54**	**0.527**

1.4 Own Use Gas

Natural gas is a compressible fluid; as a direct result of this property, it experiences a drop in temperature when it undergoes an isenthalpic expansion. When gas has its pressure reduced (at an NTS offtake or Local Transmission System PRI) the gas on the downstream side of the pressure reduction apparatus is colder than the gas on the upstream side. To avoid the gas leaving a site at below freezing point of water, and causing damage to the downstream pipeline, pre-heating may be applied. Pre-heating is only needed to maintain gas above 0 deg C and if the gas enters the site at a sufficiently high temperature, e.g. during the summer, or if the pressure reduction is small, then pre-heating may not be required).

Pre-heating requires a small proportion of the gas passing through the site to fuel the pre-heating equipment. The amount of fuel required for pre-heating is estimated by applying industry standard thermodynamic equations, LDZ throughput and system pressures together with assumptions about the efficiency of the pre-heating equipment.

Routine venting of gas by control equipment at AGIs could also be said to be Own Use Gas, however for the purpose of this paper it is included within AGI leakage.

In future years, WWU intends to use actual, metered gas consumed for AGI pre-heating rather than a calculated factor. Metering equipment is installed at a number of sites although this will require validation and in some cases replacement. However until this information has been collated WWU propose to apply the factor of 0.011% to its LDZ consumption following studies carried out by Advantica and reported to the Shrinkage Forum.

For the Formula Year 2012/13 the factor for Own Use Gas is proposed as 0.011% of LDZ consumption.

1.5 Theft of Gas

UNC Section N 1.3.2 states that LDZ Shrinkage shall include, and WWU is therefore responsible for, gas illegally taken upstream of the customer control valve and downstream where there is no shipper contract with the end-user.

There is a current consensus agreement that unidentified theft is assumed to be 0.2% of LDZ consumption, of which 10% is deemed to be Transporters responsibility, resulting in a theft of gas factor of 0.02%.

WWU propose that the Theft of Gas factor be set at 0.02% for the Formula Year 2012/13.

1.6 LDZ Energy Loss Summary

The proposed LDZ Energy Loss for the Formula Year 2012/13 are presented in the following table.

1.6.1 LDZ Shrinkage Quantity Summary

The proposed LDZ Shrinkage Quantities for the Formula Year 2012/13 are presented in the following table.

LDZ	Leakage (GWh)	Own Use Gas (GWh)	Theft of Gas (GWh)	Proposed Shrinkage Quantity 2012/13 (GWh)
Wales North	54.48	0.8	1.5	56.8
Wales South	127.19	4.6	8.3	140.1
South West	240.87	3.4	6.2	250.6
Total	**422.54**	**8.8**	**16.0**	**447.4**

1.6.2 LDZ Shrinkage Factor Summary

The proposed LDZ Shrinkage Quantities for the Formula Year 2012/13 are presented in the following table.

LDZ	Leakage (%)	Own Use Gas (%)	Theft of Gas (%)	Proposed Shrinkage Factor 2012/13 (%)
Wales North	0.743%	0.011%	0.020%	0.774%
Wales South	0.306%	0.011%	0.020%	0.337%
South West	0.771%	0.011%	0.020%	0.802%
Weighted Average	**0.527%**	**0.011%**	**0.020%**	**0.558%**

Note: All factors are expressed as percentages of forecast LDZ demand.

1.7 Detailed Analysis

1.7.1 Leakage

In May 2003, Advantica, on behalf of Transco, completed an extensive programme of Leakage Tests. The results of the leakage testing programmes have been used in conjunction with our mains and other plant records, measurements of MEG concentration and system pressures to derive total leakage by LDZ. The nature of theses tests and their findings were described in previous proposals, and will not be included in this paper.

1.7.2 Own Use Gas

The 2012/13 proposals utilise the methodology applied in previous years and incorporating the conclusions of studies carried out by Advantica, whereby Own Use Gas is indicated as being 0.011% of LDZ consumption.

1.7.3 Theft of Gas

As a result of previous discussions at The Shrinkage Forum, it was concluded that 0.2% of LDZ consumption would be used as the overall level of theft until better information becomes available.

Transco statistics confirm the 90:10 – Shipper: Transporter split in responsibility for theft of gas. We believe that it is appropriate that WWU should assume responsibility for Theft of Gas equal to 0.02% of LDZ consumption

1.8 Extent to which the Proposal would better facilitate the relevant objectives

This proposal provides an accurate estimate of LDZ Energy Loss for the Formula Year 2012/13. The gas usage and loss in transportation within the LDZs will be reflective of actual conditions. This in turn facilitates the achievement of efficient and economic operation of the system through effective targeting of costs.

It will also lead to accurate targeting of costs to Users through the Reconciliation by Difference process and this is consistent with securing effective competition.

1.9 The implications for Wales & West Utilities of implementing the Proposal including:

a) Implications for operation of the System:

We are not aware of any such implications that would result from implementing this proposal.

b) Development and capital cost and operating cost implications:

The proposed LDZ Energy Loss (which have been prepared without Pressure and Temperature correction) lead to a fair allocation of operating costs between LDZ systems.

c) Extent to which it is appropriate for Wales & West Utilities to recover the costs, and proposal for the most appropriate way for Wales & West Utilities to recover the costs:

It is appropriate for each LDZ to incur a share of the overall Shrinkage Energy cost dependant upon the actual shrinkage in that LDZ.

d) Analysis of the consequences (if any) this proposal would have on price regulation

We are not aware of any such implications that would result from implementing this proposal.

1.10 The implications of implementing the Proposal for Users

This proposal improves the equitability and accuracy of cost targeting across all Users.

1.11 Analysis of any advantages or disadvantages on implementation of the Proposal

- **Advantages:** Good representation of the actual system usage and losses leading to improved cost targeting.
- **Disadvantages:** WWU are not aware of any disadvantages.

1.12 Summary of the representations (to the extent that the import of those representations are not reflected elsewhere in the Proposal)

This paper outlines our initial proposals. We appreciate hearing the views of Ofgem and Users; these views will help inform our final proposals that are due to be published no later than 1st March 2012.

It would be appreciated if Users could let us have any feedback that they would like to share with us by 1st February 2012 in order for views to be considered prior to the notification of our LDZ Energy Loss final estimates.

1.13 Programme of works required as a consequence of implementing the Proposal

The only required modification is to the LDZ Energy Loss values entered into AT Link.

1.14 Proposed implementation timetable (including timetable for any necessary information system changes

When we publish our final proposals Users have until 15th March 2012 to request that Ofgem issues a Standard Special Condition A11 (18) disapproval of this proposal. This provision is in the UNC Section N 3.1.8.

If no disapproval notice is issued beforehand, it will be our intention to implement revised LDZ Energy Loss from 06:00 hrs on 1st April 2012.

1.15 Recommendation concerning the implementation of the Proposal

We recommend the proposed LDZ Energy Loss be implemented with effect from 06:00 hrs on 1st April 2012.

1.16 Wales & West Utilities Proposal

This report contains our proposal for the LDZ Energy Loss for the Formula Year 2012/13

Appendix 1

LP Pipe and Service Leakage Analysis 2007, 2008 & Formula years 2008/2009, 2009/2010 & 2010/2011

This section of the document provides a comparison of the assessed levels of LP pipe and service leakage by LDZ.

Details of leakage energy quantities, annual average system pressures (ASP) and Monoethylene Glycol (MEG) levels are presented for 2008 with 2007, 2008/2009, 2009/2010 & 2010/2011 for comparison purposes. The levels quoted are only those attributable to low pressure mains and service leakage.

We have supplied information relating to the average pressure that is experienced by networks that contain metallic pipes and which excludes the all PE networks that often operate at higher pressures but which have very low leakage as a result of their superior performance. This will allow Users to compare the effective operating pressures of the different LDZs.

Table 1 Wales North LDZ

	2007	2008	2008/2009	2009/2010	2010/2011
Leakage (GWh)	40.5	34.3	33.7	28.05	27.24
Annual Average System Pressure mbarg	41.79	38.25	36.65	35.55	34.25
ASP (All-PE systems excluded) mbarg	41.13	37.37	35.27	34.4	33.04
MEG Saturation Level	0%	0%	0%	0%	0%

Table 2 Wales South LDZ

	2007	2008	2008/2009	2009/2010	2010/2011
Leakage (GWh)	119.6	104.0	122	97.55	93.17
Annual Average System Pressure mbarg	33.74	34.09	34.76	34.11	34.28
ASP (All-PE systems excluded) mbarg	34.27	33.08	33.90	33.10	33.43
MEG Saturation Level	0%	0%	0%	0%	0%

Table 3 South West LDZ

	2007	2008	2008/2009	2009/2010	2010/2011
Leakage (GWh)	247.9	219.5	222.2	194.02	187.62
Annual Average System Pressure mbarg	33.65	31.79	31.56	30.90	30.44
ASP (All-PE systems excluded) mbarg	32.90	30.97	30.94	30.10	29.79
MEG Saturation Level	0%	0%	0%	0%	0%

Appendix 2

Flow-weighted Average Calorific Values (CVs) for each LDZ for 2007, 2008, 2008/2009, 2009/10 & 2010/2011

The daily flow weighted average calorific Values for each LDZ, determined in accordance with the gas (Calculation of Thermal Energy) Regulations that were used for the baseline calculations, have been used to determine flow-weighted averages. These values have been applied to convert leakage estimates in volume terms to energy quantities for each LDZ. The values are presented in the table below for comparison purposes.

LDZ	Average Calorific values (MJ/m^3)				
	2007	2008	2008/2009	2009/2010	2010/2011
Wales North	39.40	39.65	39.49	39.21	39.23
Wales South	39.20	39.26	39.22	39.42	39.29
South West	39.20	39.33	39.18	39.30	39.28