

**UNC Shrinkage Forum Minutes**  
**Thursday 04 February 2016**  
**31 Homer Road, Solihull B91 3LT**

**Attendees**

Helen Cuin (Chair)	(HC)	Joint Office
Lorna Dupont (Secretary)	(LD)	Joint Office
Angela Love	(AL)	ScottishPower
Colette Baldwin	(CB)	E.ON
Edd Hunter	(EH)	RWE npower
Gregory Edwards	(GE)	British Gas
Ian Marshall	(IM)	Wales & West Utilities
Joanne Parker	(JP)	Scotia Gas Networks
John Morrison	(JM)	Northern Gas Networks
Jonathan Findlay	(JF)	Scotia Gas Networks
Mark Jones*	(MJ)	SSE
Martin Brown	(MB)	DNV GL
Matt Marshall	(MM)	National Grid Distribution
Niall MacDowell*	(NM)	Imperial College
Nilay Shah*	(NS)	Imperial College
Paul Whitton	(PW)	Scotia Gas Networks
Rosie McGlynn	(RM)	Energy UK

\*via teleconference

Copies of all papers are available at: <http://www.gasgovernance.co.uk/sf/040216>

**1. Introduction and Status Review****1.1. Approval of Minutes**

The minutes of the previous meeting (27 October 2015) were approved.

**1.2. Actions**

None outstanding.

**2. AGI Venting Update***Venting Controllers/Positioners - understanding of natural gas emission rates at AGIs*

MM introduced MB (DNV GL), explaining that DNV GL was carrying out the asset collection work for the GDNs. MB gave a presentation, outlining the background and drivers for action on gas venting and leakage. Targets for leakage reduction were illustrated.

The aims, phases and progress of the Venting Controller project were described. MB then explained the impact on supply pressure in respect of Bristol Babcock controllers and Fisher positioners. Photographs of the various equipment were provided.

The initial results/graphs were reviewed and explained. MB confirmed that inventory and equipment pressure checks (for National Grid Distribution) had been completed for WM and NW regions, and others were underway in the remaining three regions. It was noted that the conclusion of the work was weather dependent, and all things being well it was anticipated that a report on the emissions totals for all five regions might be expected in May 2016.

Responding to questions, MM explained this study was for the National Grid regions; other GDNs were undertaking similar exercises. MM believed the rates in the Leakage model were smaller in comparison to these results. This exercise is an attempt to increase the accuracy and to be able to explain the current venting rates and what the impact might be if assets were to be changed. The GDNs expect to liaise in a collaborative approach and it is anticipated

there will be a consultation to look at the methodology. The other GDNs reported that they were undertaking similar work; this was at various stages of completion, anticipated to be complete in the next two months. On being questioned why it was taking so long, MM explained the project was to be a combined effort and had been delayed somewhat in the beginning whilst National Grid Distribution defined the scope of the surveys required to ensure that all GDNs would be collecting the appropriate data. JM added that it often took a long time to complete the inventory because of the extent of the information gathering required (site visits, age, security of site, as well as equipment).

It was questioned what the relationship might be between potential new assumptions and risk. It should be dynamic and take account of new components. Inefficient controllers will be replaced with new, and numbers should be reflected.

MM confirmed the Shrinkage and Leakage Model would be updated to account for asset numbers; the inventory was being completed, and the rates calculated for different equipment; and the model would be populated, year on year applying a profile. It was moving away from one calculation method to better reflect what is 'out in the field'.

IM observed that it was not yet to be assumed that there would be reduced shrinkage from replacing these assets. As part of the consultation baselines may be reset with Ofgem so targets can be adjusted.

Replacement of assets and GDNs' incentives to reduce risk were discussed. Concerns were raised that GDNs might have two incentives to do the same thing. Baselines may not be reflective of what is replaced. Replacement of pipes was funded; GDNs were working to reduce risk through mains services replacement. GDNs were also working to reduce risk across all assets but were not incentivised for that (only mains services).

A further progress report would be given at the next meeting.

### **3. 2016/2017 Timetable**

The timetable for the coming year had been published at: [www.gasgovernance.co.uk/SF](http://www.gasgovernance.co.uk/SF). No comments had been received.

### **4. July 2016 Shrinkage and Leakage Smart Metering Report**

IM confirmed that work was continuing. A further report will be provided in March, with a clearer indication of the timescales for a 28 day consultation in May/June (publication to Ofgem is by 31 July).

A better understanding of what Smart metering data (saturation, level of aggregation available, etc) can be obtained for GDNs' use (not able to see individual property data). There may be a potential opportunity for GDNs to use more frequent meter reads, and to use for improving the modelling.

RM advised that she runs the Smart Programme for Energy UK and would be happy to assist the GDNs in any way. IM thanked RM for her offer; the GDNs need to understand rollout timescales and from when the data can be used. There will be a consultation on a statistically valid Smart sample size and how data might be used (critical mass). Wales & West Utilities was leading on this on behalf of the GDNs.

### **5. Interference Damage Modification Update**

MM confirmed that a response to the consultation had been received and suggested principles were being considered.

The GDNs were developing a new approach to deal with the Interference Damage and modifying the model. Once the GDNs have reached an agreement, it is anticipated a consultation will be released. A further update will be provided in March.

## 6. Any Other Business

### 6.1. Annual Shrinkage and Leakage Model Update

MM confirmed this was now completed and the final response to the annual model review had been published. MM suggested an approach, e.g. a dashboard of measures taken (looking at reductions). MM would like views on this and what parties would like to see to assist in a better understanding of the information.

It was suggested that this could be discussed at the next meeting in March.

### 6.2. Low Carbon Gas Preheating (LCGP) Project

JM provided a progress report on the LCGP project, which Northern Gas Networks (NGN) was undertaking to reduce its Business Carbon Footprint (BCF). AL asked if there were implications for the model. JM believed there were potential implications, observing that some of the equipment was antiquated and the project was looking at different equipment and doing a comparison (efficiency improvements, maintenance costs, cost to use, what gas is used, etc).

JM gave a brief outline. The project has installed two 'alternative' preheating technologies across six sites of differing scale - three Thermo Catalytic Systems (HotCat) and three Low Pressure Steam Systems (LP Steam). Smart metering technology has also been installed to provide data required to calculate and publish the system efficiency of each site and each technology. Additionally, smart metering technology will be installed separately on six sites that employ existing technologies. The equipment has been commissioned and is providing data for the winter period 2015/16.

System efficiencies are calculated/published for direct comparison, and the information is accessible via the NGN website. Parties can compare the efficiency of the sites reporting into it and all data is available for download to allow parties to undertake their own data analysis if they wish. The website can be viewed by clicking: [ngnclick.co.uk/performance/data](http://ngnclick.co.uk/performance/data).

The project is due to finish this year, and a further report will be provided in August 2016.

### 6.3. Energy UK Gas Retail Group Shrinkage Study

RM gave a brief overview of the background, the methodology used, the key findings from the analysis, and the recommendations.

The project examined the determination and calculation of shrinkage and reviewed the methodology used to calculate gas shrinkage; an assessment as to whether it required updating or improving was then made.

A review was undertaken of the GDN shrinkage and leakage model and its input factors alongside similar models and factors used elsewhere, together with evidence from a variety of leakage measurements, practices in other industries; and the regulation and policy around shrinkage. The key findings (model, measurements, assumptions) were outlined.

NS explained the research sources and methodologies used, and reviewed the factors relating to the model itself. The model is most sensitive to the metallic length, the leakage rate for the metal service connected to metal main, the number of relays per km, and the leakage rates of polyethylene (PE) mains. There is evidence that a zero leakage rate for polyethylene services (as assumed by the current model) is highly unlikely in practice (although this number is low). The sample-based approach from the 2002 study to generate the leakage factors was likely to generate a bias towards underestimation as the leakage rate distribution is skewed, with large amounts of leakage being caused by relatively few leaks in large systems (any such leaks could be missed in small samples). Some important anomalies in the shrinkage model had been found which were not consistent with theory (some data was not in line with international estimates, and some assumptions were overly optimistic).

There have been a number of improvements in technology since the last calibration study was made over 12 years ago, and it would be sensible to perform another one in the near future. It was suggested that more evidence to justify the network composition assumptions should be

made available to shippers to generate more confidence in the Shrinkage and Leakage Model. Knowledge of how the current model was developed, the assumptions made, and the procedures for model maintenance could be made more transparent.

It was observed that other roadside/air borne sensor studies/reviews (e.g. of actual emission measurements in cities) report on and provide evidence that leakage rates based on estimation models generally underestimate actual leakages. This will be of importance as requirements to provide increasingly accurate greenhouse gas (GHG) emissions inventories will increase.

It was noted that the HSE based IMRP (REPEX) process has potentially had a larger impact on shrinkage than the Ofgem shrinkage allowance and emissions based incentives, although both policies generate similar outcomes. Around 80% of the shrinkage reduction arises out of mains replacement.

The previous model assumptions relating to iGTs are no longer current or negligible (their systems, and therefore impacts, have expanded over recent years) and are contributing to an underestimation of shrinkage (perhaps as much as 2 - 5% of the current estimate). In addition, there were no figures available for estimates of third party damage/interference, and it may be expected that relatively higher amounts of excavation are taking place in iGT areas, as they are areas of new development. It was suggested that a reassessment of iGTs systems and impacts should be made and taken account of in the estimation of shrinkage, and that relevant reporting should be made.

The Energy UK review also looked at other industries to assess best practice and look at possible developments in accuracy improvement. The water industry equates leakage rate estimation with "unaccounted for supply" and bases it on actual measurements using the balance between water entering the network and that consumed. A total/integrated flow method is used for the whole network and a "night-flow" method for smaller sub-networks.

The oil and gas production industry uses "age factors" to indicate that older equipment is expected to have higher leakage rates. It was suggested this could be particularly relevant to AGIs and preheaters. It also applies temperature and pressure corrections, which could be used to improve shrinkage estimates. A range of non-invasive leak detection/measuring methods had been developed, e.g. infrared detection, which might also be used in distribution networks.

It was noted that the Netherlands surveys its GDNs every 5 years, which helps to provide and maintain good quality network composition data; this is an example of best practice.

Concluding the overview, RM advised that the recommendation was to make a new calibration study. It was believed the cost might be circa £10m which, when compared to the uncertainty of the shrinkage measures, was not a large figure. The cost may be reduced through the utilisation of new non-invasive technologies. It was suggested that these could be evaluated using low carbon innovation network funding. This information is important for the National Emissions Inventory which must be reported by DEFRA every year.

RM referred to the advent of Smart meters, observing it has been stated that an updated study might be made redundant by Smart meters. Although this technology may be able to evaluate shrinkage more accurately, it will not be able to apportion it and thus will not provide appropriate actionable data - a study would still be required. This could be coupled with periodic, non-invasive leak detection activities. This could be co-managed/supported by stakeholders interested in better national emissions inventories (e.g. DECC/DEFRA) and the means to reduce emissions.

A discussion ensued. JM observed the GDNs have no information relating to iGTs infrastructures, only load and pressure information. NS suggested that a first step might be to enforce iGT reporting and address any gaps in the regulatory framework. Infrastructure data on the length of mains data per development could be ascertained. IM confirmed that the data would not affect DN adjustments and the GDNs would not incorporate the iGT data into the models.

NS added that work had been done on Imperial College's own models of permeation rates through different types of pipework, and results obtained were a little bit above current figures.

**Action SF0201: Energy UK Gas Retail Group Shrinkage Study findings - GDNs to consider reassessment of iGT information and impacts for shrinkage/leakage estimates.**

IM confirmed that WWU had considered the water industry models however due to a number of factors did not believe it to be feasible in the gas industry. Referring to 'age factors', it was observed that trying to agree a deterioration factor was very difficult because of the wide range of variations (accuracy of ages, ground conditions, materials, assets sourced/manufactured in different foundries across the country, etc). It was noted that other countries did not 'condition assess'.

AL referred to a Robotics survey being undertaken by SGN (condition assessment/fixing joints). This was at a very early stage but perhaps data/conclusions could be drawn upon in the future and shared with RM.

**Action SF0202: GDNs to advise when the Robotics survey will conclude and if data/conclusions might be shared.**

Funding was briefly discussed. The GDNs do not recover the whole cost (95% funded); it was generally not financially viable to survey great sections of network, but methods that were not invasive or too costly could be considered.

NS gave examples of roadside mapping (mobile detection, non-invasive) exercises undertaken in the USA, and how this might be applied to the networks. MB described funding in the USA. There were different approaches, which may be less accurate, and also different pitfalls; any results would have to be very carefully analysed and interpreted.

GE referred to the 'age based approach', which had its difficulties, but believed some consideration should be given to this. He believed that this should also be looked at from a customer perspective - the customer eventually funds everything. It may be worth investing to give more confidence as to the accuracy of data input into the model. There is licence obligation to review the shrinkage model and GDNs should view this as an obligation to ensure the shrinkage model is accurate and update the assumptions, preferably annually. IM confirmed the assumptions are reviewed by the GDNs but at the moment they have not found a cost effective way to update them. Disparate views expressed as to how the activity might be categorised and the GDNs were considered to be funded (how/what for - innovative or 'business as usual' activity').

RM believed this Study provided some useful information to draw upon for considering improvements; there were useful comparisons between the UK and other countries, and she believed a case could be made to review the assumptions and reporting. NM explained some of the international comparisons in more detail.

Jointing techniques were referred to and briefly discussed.

The GDNs would be happy to look at the full Study Report to assess issues and potential benefits, and engage in a collaborative approach to any further actions/improvements to be taken forward. RM was keen to engage with parties further to consider various aspects and it was suggested that an offline meeting be arranged prior to the next Shrinkage Forum meeting.

**Action SF0203: Energy UK Gas Retail Group Shrinkage Study findings - GDNs to consider the key findings and engage with Energy UK offline to discuss various aspects with a view to developing a workplan, and report back to the next Shrinkage Forum meeting.**

## 7. Diary Planning

The meeting programme for the year was discussed, and the following arrangements were agreed.

Further details of planned meetings are available at: [www.gasgovernance.co.uk/Diary](http://www.gasgovernance.co.uk/Diary)

Time/Date	Venue	Programme
10:30, Thursday 31 March 2016	31 Homer Road, Solihull B91 3LT	<ul style="list-style-type: none"> <li>• AGI Venting Update</li> <li>• Interference Damage Modification Update</li> <li>• Annual Shrinkage and Leakage Model Update</li> <li>• Shrinkage Study Update</li> </ul>
09:30, Wednesday 08 June 2016	Teleconference	<ul style="list-style-type: none"> <li>• AGI Venting Project Update</li> <li>• Medium Pressure Modification Update</li> </ul>
09:30, Tuesday 30 August 2016	Teleconference	<ul style="list-style-type: none"> <li>• Low Carbon Gas Preheating (LCGP) Project Update</li> </ul>
10:30, Tuesday 04 October 2016	Solihull (venue to be confirmed)	<i>To be confirmed</i>

Action Table (04 February 2016)					
Action Ref	Meeting Date	Minute Ref	Action	Owner	Status Update
<b>SF0201</b>	04/02/16	6.3	<i>Energy UK Gas Retail Group Shrinkage Study findings</i> - GDNs to consider reassessment of iGT information and impacts for shrinkage/leakage estimates.	GDNs	<b>Pending</b>
<b>SF0202</b>	04/02/16	6.3	GDNs to advise when the Robotics survey will conclude and if data/ conclusions might be shared.	GDNs	<b>Pending</b>
<b>SF0203</b>	04/02/16	6.3	<i>Energy UK Gas Retail Group Shrinkage Study findings</i> - GDNs to consider the key findings and engage with Energy UK offline to discuss various aspects with a view to developing a workplan, and report back to the next Shrinkage Forum meeting.	GDNs	<b>Pending</b>