

Shrinkage Error History

At the industry meeting to discuss the revised AUG Statement held on 12 May 2017, a request was made to the AUG Expert to provide information on the term “Shrinkage Error”. The following is a brief history of how the term has been used in the context of the AUG process.

- The term “Shrinkage Error” was first coined by British Gas in 2008 in UNC Modification Proposal 0194 “Framework for correct apportionment of NDM error”. This document states the following regarding LSP gas being incorrectly assigned to the SSP sector through the RbD process:

“We propose that, as in the appendix to this Proposal, the RbD Allocation Table should identify the following contributory factors:

- *Read submission issues*
- *Late Confirmations*
- *Temperature and pressure correction issues*
- *LDZ CSEP Reconciliation issues*
- **LDZ shrinkage errors**
- *Theft (which may include unreported open by-pass valves)*
- *Supply Point metering*
- *LDZ metering*
- *End Supply Metering errors”*

- It was subsequently referred to in Modification Proposal 0228/0228A from later that year, with both versions containing the following description and quantification of this error:

“• Shrinkage Errors

It is an accepted principle that losses which occur upstream of the emergency control valve are recovered based on throughput outside of the LSP and SSP allocations. In the present regime, LDZ Shrinkage is calculated based on a set of assumptions at the beginning of the period. These assumptions are validated at the end of the period and any differences are charged solely to RbD.

Independent xoserve analysis presented to the modification 194 work group on 12th June 2008 demonstrated that 0.0004% of RbD could be associated with the difference between initial and final levels of shrinkage.

It is widely acknowledged that the costs of shrinkage should be allocated on a throughput basis, such that they are borne equally by all market sector classifications

Therefore RbD error associated with differences between initial and final shrinkage levels should be attributable to individual sector “classifications” as follows;

Small supply points, 62% of volume associated with this measurement error

Large non daily metered supply points, 24 % of volume associated with this measurement error

Large daily metered supply points, 14% of volume associated with this measurement error”

- It should be noted that the **concept** of error in the Shrinkage estimation process has existed throughout the entire time that the Shrinkage process itself has existed. All elements of Shrinkage (Leakage, OUG and Transporter-Responsible Theft) are estimated using statistical

models, and standard statistical theory states that any such model will have an error associated with its output.

The current version of the Shrinkage and Leakage Model was released in 2008 and has been revised on a number of occasions to include additional elements in its calculations. Before this time a different model, the Network Leakage Reduction Monitoring Model (NLRMM) was used. Both of these are spreadsheet-based models that use standard statistical practice to make their estimates, and are hence subject to statistical theory. This theory, as stated above, includes an error element in their Shrinkage estimates.

- Shrinkage Error has been addressed in every version of the AUG Statement released to date, during both the first and the second AUG periods. The 2011 AUGS for 2012/13 contained a detailed assessment of the area, which was then referred to in subsequent versions.
- In the 2011 AUG Statement for 2012/13, the following conclusions were drawn:
 - Shrinkage bias when measured over time is assumed to be zero.
 - Any Shrinkage Error effects that do exist automatically filter through into the UG calculations and form part of the Balancing Factor. These may include:
 - Individual non-zero year-to-year effects that together create a net effect of zero when considered over a number of years.
 - Situations where the assumption of zero bias is incorrect and there is actually a systematic error in the Shrinkage values.
- The Unidentified Gas methodology has therefore always considered the possibility of an error in the estimate of Shrinkage. However, the best estimate of the shrinkage error has always been zero, with the caveat that if this assumption was incorrect, the resultant Shrinkage gas that filtered through into the UG calculation would reside in the Balancing Factor. This methodology has been approved by the industry every year from 2011 to date.
- This approach remained in place from 2011-2015 due to the lack of evidence to contradict these assumptions. Subsequently, however, Energy UK employed Imperial College to conduct a detailed study into the effect of Shrinkage on domestic customers. This report concluded that there was likely to be a bias towards under-estimation in the Shrinkage and Leakage Model, and that the best estimate of this was of the order of 20%.
- The Imperial College analysis was on the agenda at several Shrinkage Forum meetings in 2015 and 2016, and following discussions between the relevant parties the gas Transporters conducted their own analysis and responded to the Imperial College document in November 2016. They pointed to a number of issues that *could* cause some of the Imperial College conclusions to be incorrect and themselves concluded that there was insufficient evidence to infer a non-zero Shrinkage bias.
- The annual review of the Shrinkage and Leakage Model carried out in November 2016 referenced both the Imperial College document and the GDNs' response but did not comment on their relative merit. British Gas responded with continued concerns about non-zero Shrinkage bias.
- In 2017, the AUGS proposed to include the results from the Imperial College analysis in the Unidentified Gas calculations. Following discussion at AUGS industry meetings, it was noted that the two conflicting positions of Imperial College and the GDNs remained unresolved and that no firm conclusion about Shrinkage Error had been drawn. The AUGS requested that the Shrinkage

Forum, as a group of experts in the area and as a collectively impartial body, draw a final conclusion and communicate this to the industry. This conclusion would then feed into the decision-making process for the final Shrinkage Error figure (either zero or non-zero) to be used in the Unidentified Gas calculations for 2017/18 if received by the AUG Expert on or before 23 June 2017.

- ICoSS wrote to UNCC on 17 May 2017 suggesting that as the Shrinkage Forum does not have legal vires, it would be more appropriate for any communication to come from UNCC and requested that the UNCC consider this.
- The industry debated this issue at the UNCC meeting held on 18th May 2017. The minutes of this meeting, containing the differing views of the various industry parties present, formed the requested response.