A report on the Performance Assurance methodology developed by Xoserve for the Performance Assurance Workgroup

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Appendix 1 Methodology results monthly read meter population for an LDZ

[Note: data for appendix 1 is not included in the report, it is hoped this will be ready for the 6th March 2015 meeting. This does not prevent the methodology being considered by the PAW]

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1.0	Performance Assurance Workgroup (published on Joint Office website)	22 October 2014
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Executive Summary

The Performance Assurance Workgroup was established:

"*to ensure that gas settlement has accurate allocation, control, self-monitoring and governance post Project Nexus so that no commercial advantage can be derived from settlement*"

To meet this aim a number of steps are required. These include defined performance standards and measures, a means by which Shipper performance can be assessed, some aspect of governance of the arrangements, and if deemed appropriate a mechanism to promote the right behaviours.

In January 2014 Xoserve presented to the Performance Assurance Workgroup a proposal for a Methodology to assess Shipper settlement performance and Shipper contribution to settlement risk (late reconciled energy). The Workgroup was supportive of the proposal and invited Xoserve to develop this further. The first iteration of the Methodology has been completed and actual Shipper data processed. This has provided a set of results that appear to show that there is a difference in contribution to settlement risk between Shippers, this is largely in terms of Shipper portfolio size and then in Shipper performance, a result that was not entirely unexpected, but is helpful to have confirmed.

However, it is noted that further development of the statistical methods should be considered to ensure results appropriately assess Shipper contribution to settlement risk. Some weighting of the factors used may need to be considered.

The proposed Methodology and its results provide the opportunity to consider how performance could be reported, how an incentive regime may be structured and the opportunity to test scenarios this in a safe environment to ensure any final design meets the industry's requirements with no unintended consequences.

1. Introduction

This report describes the work undertaken by Xoserve to develop a Methodology to assess settlement risk. The outline Methodology (presented in January 2014) has been developed and tested and now actual data has been applied to provide an assessment of settlement risk.

The purpose of developing the Methodology is to prove it is possible to make an assessment of settlement risk using certain factors. Having achieved this it is now possible to use the outputs to further develop industry thinking on a performance assurance scheme.

This report presents the Methodology and results and provides suggestions on the potential utilisation of the results, how further development of the methodology may be made and the next steps available to the Performance Assurance Workgroup.

It is fully recognised that other methodology using other performance indicators can be developed and that there are many ways of assessing settlement risk. Xoserve's offering to the industry provides something to support the Performance Assurance Workgroup in its development of the overall scheme.

2. Background

The Performance Assurance Workgroup (PAW) was created in January 2013 with the aim:

"*to ensure that gas settlement has accurate allocation, control, self-monitoring and governance post Project Nexus so that no commercial advantage can be derived from settlement"*[1].

In order to achieve these objectives an overall Performance Assurance Scheme is required, within which a Methodology is developed and applied.

The Methodology is the systems, data, formulae and analysis to measure and monitor industry performance at participant level. The Scheme is the overall framework

[1] PAW Terms of Reference Feb 2013
http://www.gasgovernance.co.uk/sites/default/files/Summary%20of%20Gas%20Performance%20Assurance%20Framework%20JO%20Jan%202013%20(2)_0.pdf

incorporating the Methodology and any performance regime (targets, incentives, rewards, etc) and management activity.

Xoserve considered that it could propose a Methodology to test the viability of a performance framework, but that the industry (those affected by the regime) is responsible for the development of the Scheme.

In January 2014 Xoserve presented to the Workgroup a proposal for a methodology. This proposal [2] outlined a Methodology and how it may support the development of a Scheme.

The Xoserve proposal was presented and discussed and Xoserve's action plan for the next stages was accepted. This included developing the Methodology further by applying actual data to assess the viability of operational delivery and assessing how the results may be utilised by the PAW for the development of the Scheme.

The remainder of this report describes the outcome of Xoserve's work and potential next steps for consideration by the PAW.

3. Overview of the Methodology

The Methodology firstly measures read submission against read submission requirements as defined by the meter reading frequency of the meter point. The meter reading is the end point of settlement for the relevant period -the reconciliation period. From this the Methodology then assesses what has not been read both in terms of number of meters not read and then the AQ of the unread meter points.

Energy is attributed (DM) and allocated (NDM) to each meter point on a daily basis. This creates risk for the Shipper community in that actual energy usage will differ from allocated energy and until reconciliation occurs, the difference (the reconciliation value) is being funded by the Shipper community. The Shipper community is either awaiting a credit (a debit reconciliation for the individual Shipper) so it has funded the energy for the reconciliation period or is awaiting a debit (a credit reconciliation for the individual Shipper) and so has accrued an unknown debt. This is a measure of settlement risk.

In both circumstances (credit or debit) the reconciliation period creates risk. In an ideal world reconciliation values should be close to the allocated energy and should be of low value, and most importantly, reconciliation (reconciliation performance) should be timely to minimise the reconciliation period and time value of the risk. However, as the Methodology results show, individual Shipper reconciliation performances vary between Shippers and there is value in both the use of a Methodology to measure settlement risk and a Scheme that appropriately reports and / or incentivises the performance and desired behaviours.

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2 http://www.gasgovernance.co.uk/sites/default/files/PAF%20presentation%20Xoerve%20proposal%20Jan%2014.ppt

Every meter point is monitored for its expected read (within the meter read frequency nominated by the Shipper – daily, monthly, six-monthly or annually). Being at meter point level, the Methodology ensures that no meter point escapes scrutiny with regards to its meter reading and the Shipper contribution towards industry settlement risk.

The period between readings represents the period of risk (settlement risk) for the Shipper community. Therefore a Shipper providing reads in accordance with meter read frequency requirements is contributing less settlement risk to the community than a Shipper that does not, although other factors need to be considered to assess the size of risk and therefore each Shipper's contribution to settlement risk.

In the presentation to the PAW in January, Xoserve included the following information:

Meter read frequency	Number of meter points	Total AQ
Daily metered	Fewer than 1600	85 twhr
Monthly read	Between 100k and 140k	100 twhr
Six-monthly	Between 8m and 12m	160 twhr
Annual	Between 8m and 12m	165 twhr
Total	Approx 21,800,000	510 twhr

This is presented to show the scale of AQ to be reconciled. It is recognised that other factors e.g. confirmed no asset, may contribute to settlement risk and these can be brought within the scope of the Methodology. However, as yet other factors have not been considered as the focus has been on the primary settlement performance / risk factor – meter reading submission. The other factors may not have a material impact on settlement risk.

The Methodology includes the monitoring of individual Shipper performance over time. This trend analysis in the Methodology creates a predictive aspect in that Shipper's historic performance and other factors e.g. portfolio growth etc, can be used to assess the future risk the Shipper performance may create for the Shipper community.

Currently the settlement regime operates meter point reconciliation for larger supply points and reconciliation by difference for smaller supply points. This will change with the implementation of Modification 0432 Project Nexus – Gas Demand Estimation, Allocation, Settlement and Reconciliation reform, scheduled for implementation in October 2015. This modification creates individual meter point reconciliation for all meter points. The counter party of each reconciliation is the Shipper community. The proposed Methodology can be applied in the current and future 0432 settlement regimes

The current settlement regime includes within it the meter reading frequency. This creates the position whereby a level of settlement risk is considered 'reasonable' e.g. the UNC rules on read frequency imply that it is reasonable for a meter point with an AQ of a certain value to remain unreconciled for a six-month period. The proposed Methodology works on the basis that settlement risk to be measured is that which is as a result of behaviour which is beyond the reasonable expected position as compared to the meter read frequency.

To summarise, the proposed methodology considers the major component of settlement risk to be the unreconciled energy that exists until a meter reading is submitted that enables the reconciliation of allocated to actual energy. All Shippers create settlement risk and Shipper performance which leads to risk beyond the reasonably expected position can be measured. This then allows the development of the Scheme which may include an appropriately targeted reporting and / or incentive regime, based upon measured and tested data.

4. The application of the Methodology, results and further considerations

4.1 Unread meters and unread AQ

As previously mentioned the Methodology relies on monitoring meter readings for each meter point. Each meter point has a meter read frequency (daily, monthly, six-monthly and annual) against which the submission of meter readings can be measured.

Xoserve has analysed Shipper's reads accepted on the UK Link system against the meter read frequency and can therefore create a measure of a Shipper's read performance against the meter read frequency requirement. However, this alone does not provide the full performance / settlement risk position.

To assess the risk created by an individual Shipper more appropriately, the magnitude of allocation that has not been reconciled must be considered. Accepting that certain read frequencies are considered to be reasonable, it is what has not been read beyond the expected read frequency that creates the settlement risk.

Table 1, below, illustrates this further.

Shipper	Number of meters to be read in the period	Total AQ of meters	Number of meters actually read	Number of meters **UNREAD**	Percenatge of **UNREAD** meters	Total AQ of **UNREAD** meters	Percentage of **UNREAD** AQ
A	200	2,000,000	150	50	25%	1,000,000	50%
B	200	5,000,000	100	100	50%	500,000	10%
C	500	10,000,000	200	300	60%	2,000,000	20%
D	500	10,000,000	200	300	60%	4,000,000	40%
E	500	10,000,000	400	100	20%	8,000,000	80%

Observations:

- Shippers C and D have the same read performance (40%)
- Shipper D has a greater percentage of unread AQ than Shipper C
- Shipper D is contributing more to settlement risk than Shipper C
- Shipper E has the highest read performance (it has read 80% of its portfolio),

- Shipper E has the lowest energy reconciliation performance - percentage of unread AQ is 80%. Shipper E is contributing most to settlement risk.

Settlement risk needs further assessment and this is detailed in Table 2.

The above example provides a simplistic view to demonstrate that read performance and contribution to settlement risk may not necessarily be aligned, and will vary between Shippers dependent on portfolio AQ.

Table 2, below, takes the measurement of Shipper performance / settlement risk a step further using the logic of the proposed Methodology. The table below illustrates the workings of the Methodology and how shippers with different performance and different portfolio size can all be assessed under the one Methodology.

Column:

- A is the Shipper
- B is the total AQ of the shipper's meters to be read in the required period
- C is the total AQ value of the meter points read within the required period
- D is Column C expressed as a percentage of Column B
- E is industry average taken as the sum of column C as a percentage of the sum of column B). Note, this figure is not a measure of read performance, it is a measure of the AQ read measured against the total AQ of only the meter points that are expected to be read in the required period.
- F is column E divided by column D)
- G is Column B minus Column C (total of the unread meter point AQs)
- H is Column F multiplied by Column G. This is a means of ranking individual Shipper contribution to settlement risk. It takes account of the "performance" of AQ read against AQ required to be read and the amount of unread AQ that is contributing to settlement risk. The lower the value the less is the contribution to settlement risk, so Shipper C in this example.

A	B	C	D	E	F	G	H
Shipper	Portfolio AQ	Actual portfolio AQ read	Actual portfolio AQ read as a % of Portfolio AQ	Industry average of actual AQ read (total of column C) expressed as a percentage of the total AQ expected to be read (total column B)	Industry average (column E) divided by actual AQ read (column D)	Unread AQ	Extent of contribution to settlement risk
A	200	50	25%	44%	1.76	150	264
B	4000	1000	25%	44%	1.76	3000	5280
C	800	600	75%	44%	0.59	200	118
D	1600	1200	75%	44%	0.59	400	236
E	3200	2400	75%	44%	0.59	800	472
F	5000	2500	50%	44%	0.88	2500	2200
G	4000	500	12%	44%	3.67	3500	12845
totals	18800	8250					

It is important to note that this table is provided to illustrate the Methodology and prove that shippers with different read performance and different sized portfolios can be assessed and the extent of contribution to settlement risk identified. Other statistical methods are available to apply to the Methodology. It is recognised that a group such as the Demand Estimation Sub Committee (DESC) may be able to develop the most appropriate approach. However there are some issues with this in that is appears unlikely that the results and be reviewed and tested without compromising Shipper anonymity.

4.2 Methodology results

The results for the July 14 – December 14 monthly read meter population for East Midlands LDZ have been analysed and future month's data will continue to be captured and analysed. The data for six-monthly and annually read meters is also available for analysis although analysis has yet to start for these populations.

As far as is reasonably practicable with regard to Shipper anonymity the results for month read frequency are shown in appendix 1. However, it should be noted that 5 Shipper records taken at random have been removed entirely from the exercise. It is still possible to infer from the remaining Shippers, that the Shippers contributing the most to settlement risk are most likely to be those with the larger portfolios of monthly read meter points. This was an expected outcome, but confirmation is important. Similar results are expected for six-monthly and annual meter read frequency meter points.

The initial results, and more data is needed to confirm these, suggest that this data will be fundamental in the development of any sort of cost effective incentive regime and performance assurance board role.

Xoserve would welcome the opportunity to discuss the Methodology and results to ensure that it is measuring what is intended in the correct way and that any analysis that may be made is serving the correct purpose. Xoserve acknowledges that the data from the Methodology can be analysed in many ways and further development is required. However, this is cannot be undertaken without revealing certain characteristics of the population. One source of support is Ofgem. If possible Xoserve may be able to work with Ofgem statistical experts to review Xoserve's work, develop it further and then, possibly, be able to provide the results that will inform the development of other aspects of the regime.

4.3 Additional considerations

4.3.1 Reconciliation Variance consideration

There is then a further refinement available within the Methodology which is to consider Shipper average reconciliation variance. Reconciliation variance is the difference between actual and allocated energy. A high variance suggests the AQ (which is used for allocation) is less reflective of the meter point consumption, a low variance suggests it is more appropriate. Taking an average of the Shipper's reconciliation variance over a period might suggest (and could only suggest) what the Shipper's settlement risk profile looks like in comparison to other Shippers.

Table 3, below, provides an example (again only using monthly read frequency for one month for ease of presentation).

Shipper	No of meters	AQ of meters	No of meters unread	AQ of unread meters	Average reconciliation variance
A	10	1000	5	500	-2.5%
B	10	1000	5	500	+4.7%
C	10	1000	5	500	-10.2%

Based on the meter points that have been reconciled, Shipper C has a larger settlement risk profile than A or B. Shipper C's remaining meter points when read and reconciled might be expected to reconcile a greater volume of energy than Shippers A or B. However, this cannot be guaranteed and so this additional measure should be used with care, if at all.

4.3.2 Meter reading submission

The Methodology is at meter point level. At the start of each month the meter points with a read requirement falling due will be known. This population will comprise:

- all monthly read frequency meter points
- those six-monthly read frequency meter points where this is "month six" or greater
- those annual read frequency meter points where this is "month 12" or greater

It is not the case that at the end of the month, after taking into account portfolio losses, the actual meter points requiring a read and for which a read has been submitted will be known. This is because the UNC provides for a period by which the meter reading can be submitted e.g. in UNC M 3.3.4 (b) some meter readings may be provided by the 25th Supply Point Systems Business Day after the Meter Read Date. Therefore any performance measurement can only be performed after the read submission "close-out".

Once read submission close-out has been reached the read performance can be measured and settlement risk assessed.

As the Methodology operates at meter point, once a meter reading has been received its read requirement has been satisfied. Further readings for the same meter point will not act as a "credit" and offset the meter points for which a read is outstanding.

4.3.3 Meter points that never reach the "target" read requirement population

If a meter point with a six-monthly read frequency is read every two months it will never appear as part of the read requirement. Every time a meter reading is submitted the six-monthly "clock" is re-set. So it may appear that a Shipper is not seeing the "benefit" from reading meters in a timely manner.

However, the requirement is to understand how a Shipper contributes to settlement risk, it is not what the Shipper has done that is important, but what remains to be done.

4.3.4 Meter information that is incorrect

The Methodology does not deal with the circumstances where some aspect of meter information is incorrect e.g. metric / imperial indicator is incorrect. The Methodology is measuring read submissions and so reads may be being submitted and accepted, but settlement risk is being created. Other than an assessment of the number of corrections each year to the metric/imperial indicator where the meter remains unchanged and then a pro-rata of this, there is little the Methodology can do to assess this issue.

4.3.5 Allocation Profile

Whilst the frequent reconciliation of a meter point will minimise the duration of settlement risk, a further factor to be considered, for monthly read meter points, is how close the AQ tracks to the annual load profile and / or winter average ratio band. Further work is needed in this area to assess any settlement risk, but this work is only of value once the monthly read performance has been measured and understood over a period of time. So this topic may be included as a later refinement to the Methodology.

4.3.6 RGMA Rejections

Shippers submit RGMA files to maintain asset records on UK Link. The correct asset record helps ensure the correct meter reading is provided and meter reading submission is essential to limit settlement risk. RGMA rejections information is captured by Xoserve and is provided to each Shipper. It can be

argued that this may contribute as a measure to a Shipper's settlement risk profile (asset records not updated and so reads cannot load). However, what the statistics do not show is when the rejected RGMA file is re-worked and re-submitted. So RGMA rejections on their own should be used with care.

5. Next steps

With the Methodology in place it is be possible to use its outputs for the further development of the Performance Assurance Workgroup activities. These include:

- An understanding of what settlement risk is
- A possible assessment of what the financial value of this may be
- An assessment of the likelihood of whether the risk is material and that it has materialised e.g. a change in the settlement risk would have a measurable impact on all Shippers
- An assessment of what a target position may look like that sets a reasonable balance between the targets set (to minimise settlement risk) and the costs of meeting the performance targets
- Tested development of an incentive regime
- A proven cost benefit case
- The development of roles and responsibilities of scheme parties e.g. the performance assurance board, the administrator role etc.

The Performance Assurance Workgroup is invited to consider this report.

Appendix 1 Output of the Methodology

The tables below show a sub-set of the output of the methodology for July and August 2014 for a single LDZ. A randomly generated id has been created that is consistent across the two months shown below. In addition, at random, 5 shippers have been removed from the analysis.

A shipper can work out its own position up to column H by applying its own data to Table 2 in section 4.1. and the industry average figure from the tables below.

Data to be provided later