Unaccounted for Gas Report

National Grid

Gas Transmission

April 2017

Target audience

Ofgem and other interested industry parties

About this document

This document sets out the work undertaken by National Grid Gas, in its role as System Operator, to investigate potential causes of Unaccounted for Gas (UAG).

It is published to meet National Grid Gas Plc (NTS) Gas Transporter Licence Special Condition 8E: Requirement to undertake UAG Projects to investigate the causes of Unaccounted for Gas (UAG).

Executive Summary

This report provides a review of National Grid's Unaccounted for Gas (UAG) management over the last five years with particular emphasis on 1st September 2016 to 28th February 2017 inclusive, the period since the publication of the October 2016 UAG report.

Over the past six months assessed UAG has reduced significantly. The total monthly assessed UAG quantities for September 2016 to February 2017 are all less than for the equivalent months of 2015/16. In addition for 5 of the last 6 months total monthly assessed UAG has been less than the long term average monthly assessed UAG. Moreover, total monthly assessed UAG has been negative for the months of December 2016, January 2016 and February 2017. The quantities of negative UAG observed during the period covered by this report have not been seen in over 10 years. National Grid is continuing to investigate the causes of this negative UAG. These investigations are the focus of the Meter Assurance team's current activities.

It is expected that for Formula Year 2016/17 annual assessed UAG will be significantly less than for Formula Year 2015/16 and will support the decline in annual quantities observed since 2009/10. It is also expected that National Grid will process almost as much meter/data error reconciliation, in absolute energy terms, as was reconciled during 2015/16. This again supports the upward trend in the amount of energy reconciled by National Grid over the past five years whilst a downward trend in the annual assessed UAG has been observed over the same period.

Development of the NGage and NGageCalc applications has now been completed with the release of version 2.0 of the applications to meter asset owners expected to take place during April 2017.

Progress has been made on the determination of UAG following meter/data error reconciliation and on enhancing National Grid's analytical capability to support its ongoing work into the investigation of the causes of UAG. This includes the continued development of the Gas Control Suite system.

Good progress has also been made on obtaining and reviewing meter validation information for NTS entry and exit facilities. This data is being used to assist with the identification of causes of UAG and to inform the release of the NGage application and the preparation of the meter witnessing campaign for 2017/18.

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1. Introduction

This report provides a review of National Grid's Unaccounted for Gas (UAG) management. The report provides information on assessed Unaccounted for Gas quantities over the last five years with particular emphasis on 1st September 2016 to 28th February 2017 inclusive, the period since the publication of the October 2016 UAG report. (The October report covered UAG management during the period up to and including 31st August 2016). It also describes the various activities and initiatives that National Grid has been undertaking or is planning to undertake to investigate the causes of UAG.

UAG is one of the three components of NTS Shrinkage together with Own Use Gas (OUG) and CV Shrinkage (CVS). Further information on the components of NTS Shrinkage can be found on the National Grid website via the following link: http://www2.nationalgrid.com/uk/industry-information/gas-transmission-system-operations/balancing/unaccounted-for-gas/.

To compliment this report, National Grid also provides a range of UAG related data including:

- all previous UAG reports
- daily data on the components of NTS Shrinkage including UAG

which are available on the National Grid website via the above link.

This report and the UAG related data published on the National Grid website discharge National Grid Gas's responsibilities under the Gas Transporter Licence Special Condition 8E: Requirement to undertake UAG Projects to investigate the causes of Unaccounted for Gas (UAG). Special Condition 8E is reproduced in Appendix I of the report. The relevant data used to produce the tables and graphs included in the report is provided or referenced in Appendix II.

If you have any feedback or questions on this document please contact the National Grid Meter Assurance team via the following email address:

DataAssuranceandQualityTeam@nationalgrid.com.

2. National Transmission Unaccounted for Gas Trends

This section of the Unaccounted for Gas Report provides information on assessed Unaccounted for Gas quantities over the last five years with particular emphasis on the period September 2016 to February 2017.

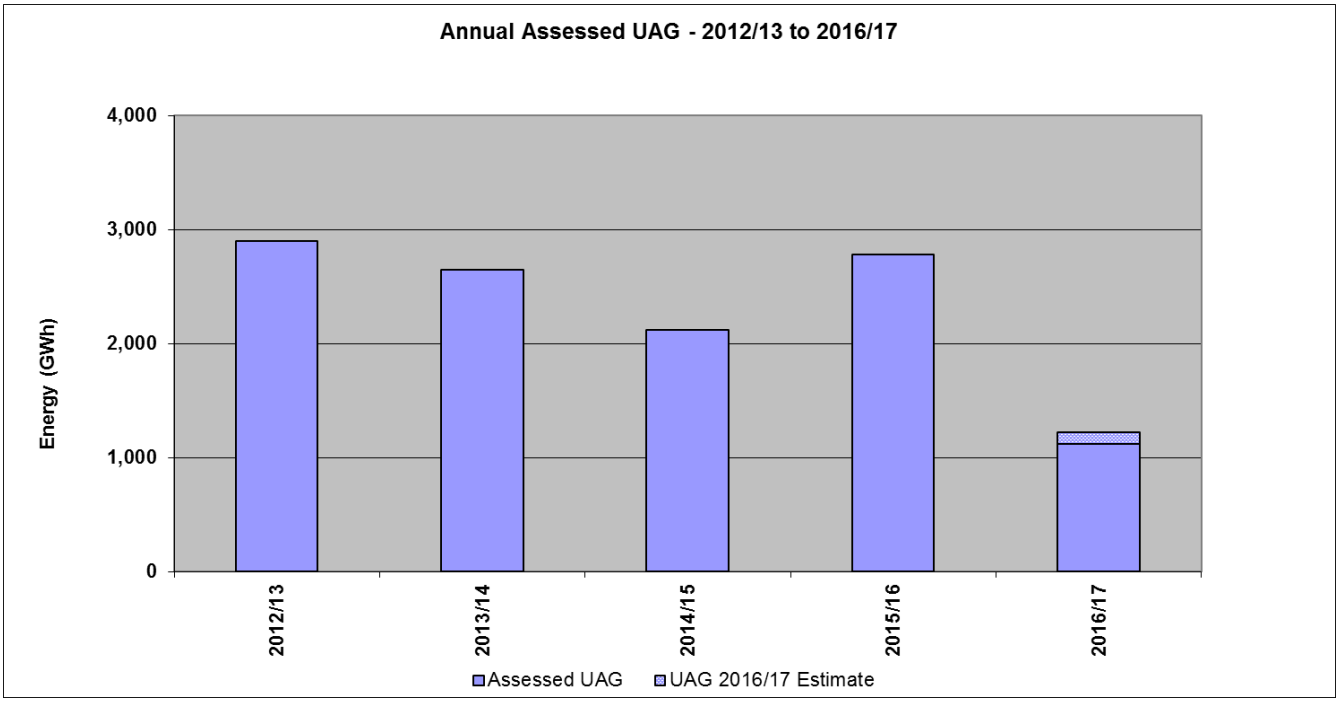

Figure 1: Annual assessed UAG – 2012/13 to 2016/17

Figure 1 provides the annual assessed quantities of UAG for Formula Years 2012/13 to 2016/17. A Formula Year refers to the period from 1st April to 31st March of the following year. Figure 1 also provides an estimate of the additional quantity of UAG that is expected to be generated during the remainder of the current Formula Year.

From the above figure it can be seen that the total assessed UAG quantity for 2016/17 is expected to be significantly lower than for the previous years and is currently estimated to be over 56% less than the equivalent quantity for 2015/16. It appears that the year on year reduction in the annual assessed UAG quantities observed since 2009/10, with the exception of 2015/16, may have continued.

Table 1 provides the actual assessed and estimated levels for UAG, OUG and CVS for 2016/17. The table indicates that OUG is expected to the predominant element of NTS Shrinkage for 2016/17.

2016/17	UAG	OUG	CVS	Total
Actual Assessed Levels - April to February (GWh)	1,117	2,392	71	3,580
Estimated Levels – March (GWh)	104	222	7	332
Estimated Annual Levels (GWh)	1,221	2,614	78	3,912

Table 1: Actual and estimated assessed levels for UAG, OUG and CVS for 2016/17

Table 2 provides the annual and daily average assessed UAG quantities for Formula Years 2012/13 to 2016/17. The table also provides the annual assessed UAG quantities as a percentage of annual NTS Throughput.

UAG Statistics	2012/13	2013/14	2014/15	2015/16	2016/17*
Assessed Annual Level (GWh)	2,894	2,648	2,121	2,782	1,117
Assessed Daily Average (GWh/d)	7.93	7.25	5.81	7.60	3.35
Percentage of NTS Throughput	0.29	0.29	0.23	0.29	0.13

*2016/17 covers period 1st April 2016 to 28th February 2017 inclusive

Table 2: Statistical performance of UAG - 2012/13 to 2016/17

The values provided in the table for 2016/17 cover the 11 month period from 1st April to 28th February and indicate that the daily average assessed UAG quantity for the year is currently significantly lower than that for the previous year. UAG as a percentage of annual NTS Throughput for 2016/17 is also currently significantly lower than for 2015/16.

Figure 2 provides the total monthly assessed UAG from April 2012 to February 2017. It also provides the average monthly assessed UAG for this period (195.98 GWh). For 5 of the last 6 months total monthly assessed UAG has been less than the long term average monthly assessed UAG.

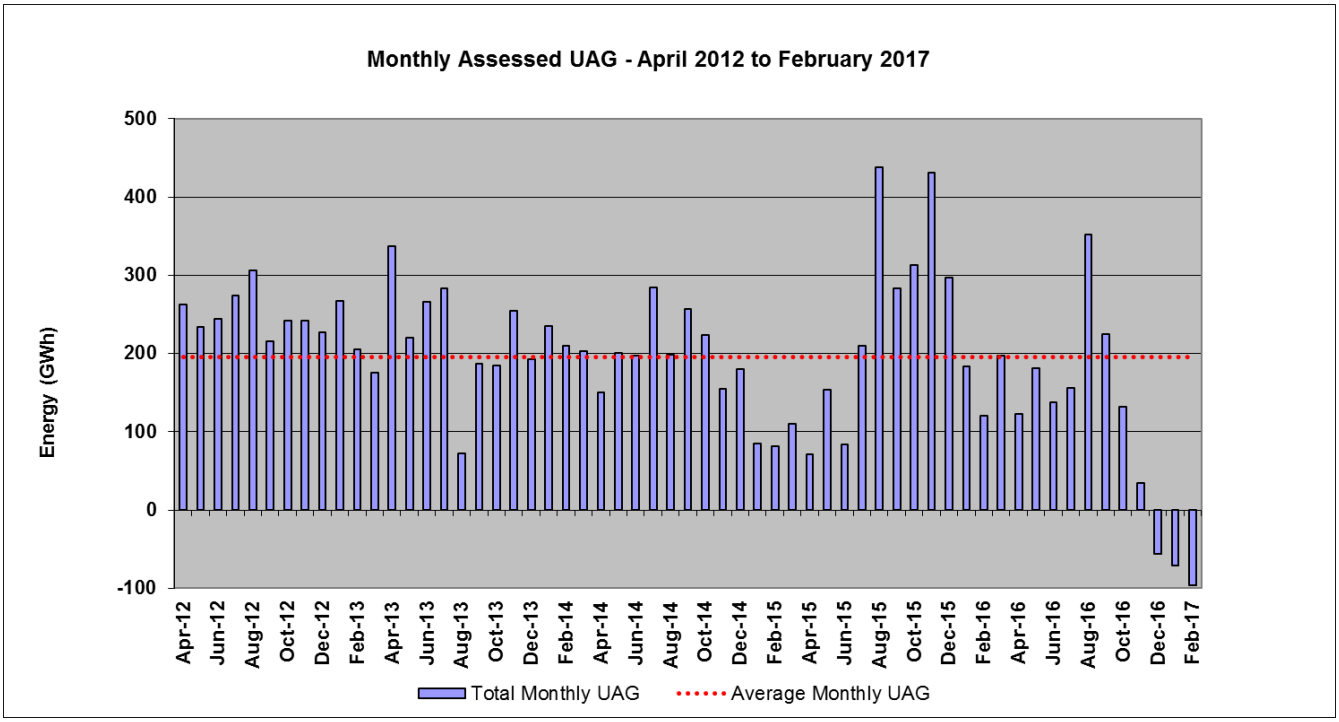

Figure 2: Monthly assessed UAG - April 2012 to February 2017

From the above figure it can be observed that there has been a substantial reduction in total monthly assessed UAG since October 2016. Moreover, total monthly assessed UAG has been negative for the months of December 2016, January 2017 and February 2017.

The possible emergence of a seasonal profile over the past 2 years referred to in the October 2016 report, with lower monthly values being observed during the February to June period and higher monthly values observed during the August to December period, does not appear to have been repeated during 2016/17.

Figure 3 provides the total monthly assessed UAG for September 2016 to February 2017 compared to the equivalent months of 2015/16. Figure 3 indicates that total monthly assessed UAG for 2016/17 has been less than the previous year's monthly value for each of the last 6 months. The total monthly assessed UAG has reduced each month with total monthly assessed UAG being negative for the last 3 months of the period.

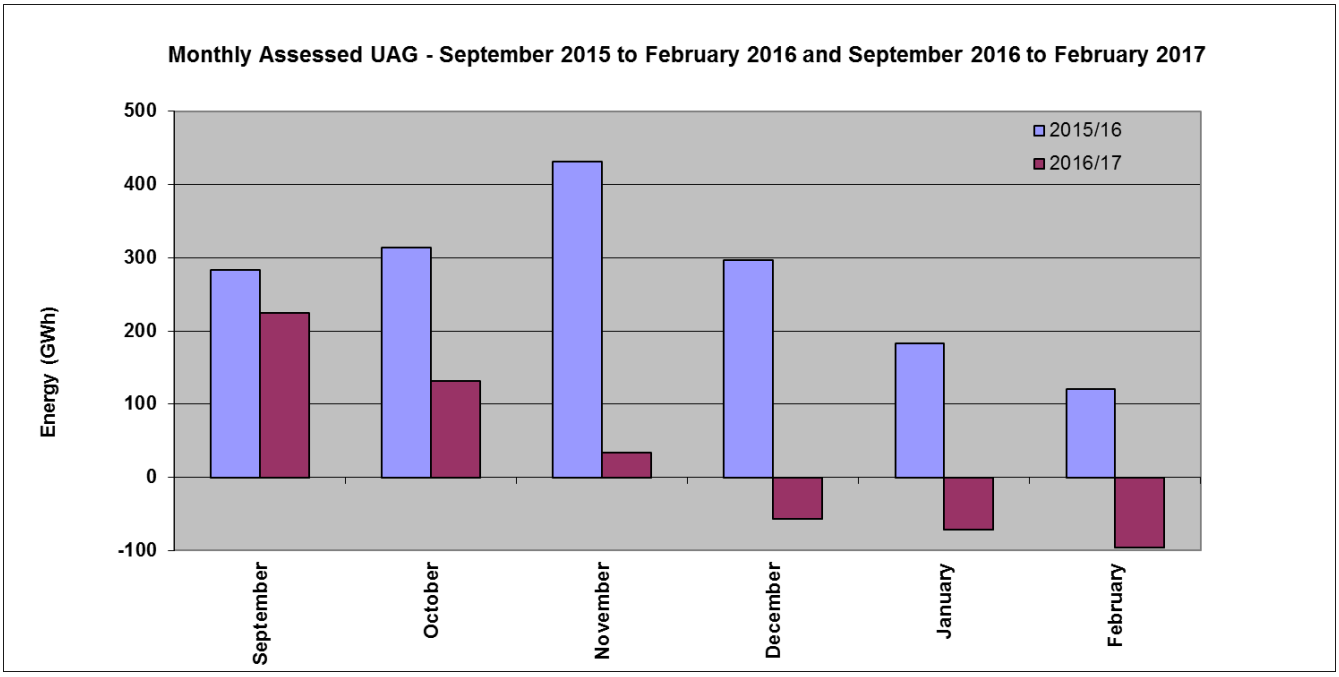

Figure 3: Monthly assessed UAG – September 2015 to February 2016 and September 2016 to February 2017

The quantities of negative UAG observed during the period covered by this report have not been seen in over 10 years. National Grid is investigating the potential causes of this negative UAG. These investigations are focussing on identifying potential meter or data errors at one or more NTS entry facilities (meter(s) under reading), at one or more NTS exit facilities (meter(s) over reading) or a combination of both.

Figure 4 provides the daily assessed UAG values for 1st September 2016 to 28th February 2017. Figure 4 indicates that there continues to be large day to day variability in the daily assessed UAG values. During this period daily UAG varied from -33.0 GWh to +32.5 GWh.

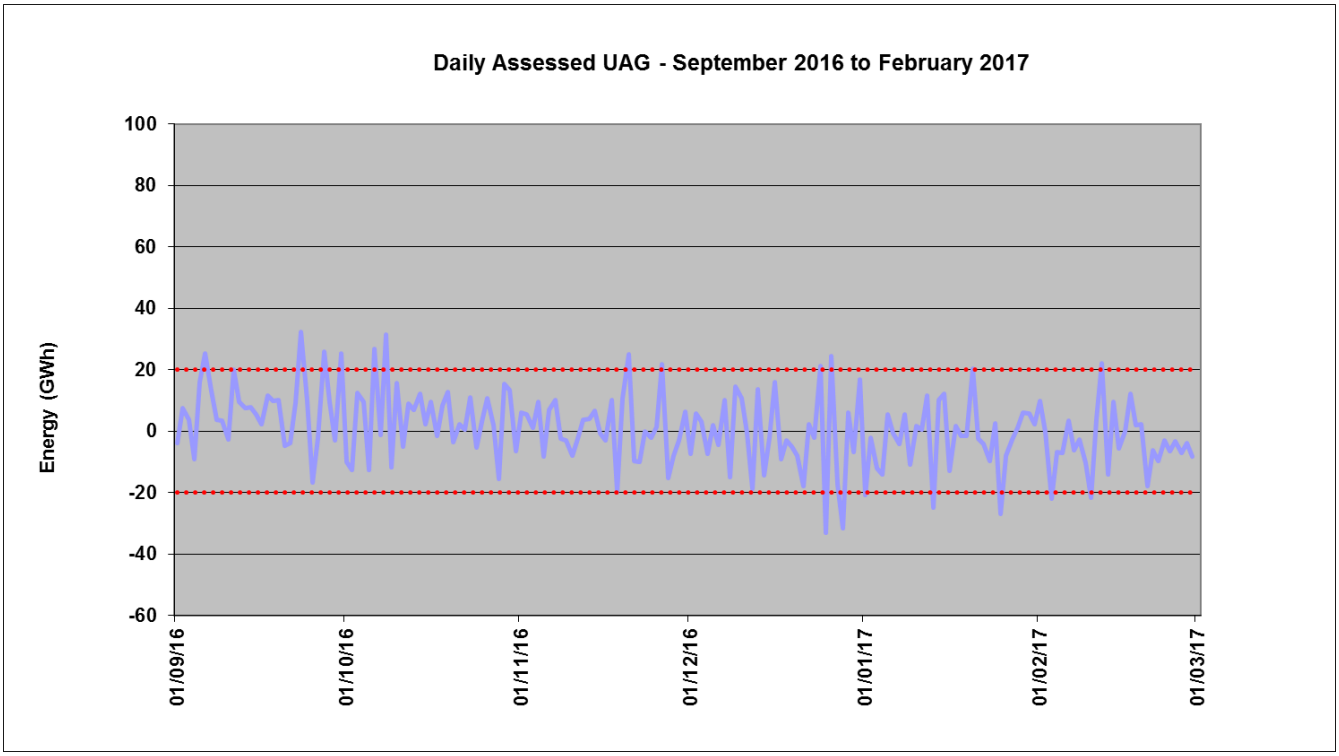

Figure 4: Daily assessed UAG – September 2016 to February 2017

There were fewer instances of very high positive UAG during the September 2016 to February 2017 period than during the previous 6 month period. There was, however, a significant increase in the number of days subject to negative UAG with 48.6% of negative UAG days during this period compared to 27.7% of negative UAG days during the previous 6 months.

National Grid reviews and investigates the assessed UAG values on a daily basis paying particular attention to any values that exceed ±20 GWh. These baseline UAG quantities are provided as red dotted lines in the above figure. During the period of September 2016 to February 2017 there were 20 days when daily assessed UAG exceeded ±20 GWh (11% of occasions). This is a small increase on the 19 days observed when daily assessed UAG exceeded ±20 GWh (10.3% of occasions) during the previous 6 month period.

Investigations into these days focus on trying to identify data or meter errors which then results in the reconciliation of these errors. Further information on reconciliation is provided in section 3.2 of this report.

National Grid is continuing to investigate all days with high levels of positive or negative UAG during the September 2016 to February 2017 period. This includes investigating NTS supply and demand pattern changes over this period which may have contributed to the levels of UAG observed. National Grid is also continuing to monitor for the presence of any trends.

3. UAG Management Activities

This section of the Unaccounted for Gas Report describes the various activities and initiatives that National Grid has been undertaking or is planning to undertake to investigate the causes of UAG.

3.1 Meter Witnessing

National Grid plans and undertakes an annual meter witnessing campaign. For 2016/17 the annual meter witnessing programme comprised 24 visits to a range of different metering installations including terminal, NTS storage, power station and gas distribution network facilities.

National Grid was able to undertake only one witnessing visit during the period September 2016 to February 2017. This was to a NTS power station metering installation. This small number of visits was primarily due to staff changes within National Grid's Meter Assurance team but also due to the team prioritising the processing of a much larger number of reconciliations and the collection and review of meter validation reports.

National Grid has traditionally received a relatively modest sample of meter validation reports, typically from the operators of power stations or gas distribution networks. During the past 6 months validation reports have been requested for all entry and exit facilities connected to the NTS including, for the first time, terminals and storage facilities.

Reports for validation exercises that have taken place since April 2016 have been received for the vast majority of metering installations at these entry and exit points. The Meter Assurance team are currently reviewing these reports and, where necessary, are raising queries with meter asset owners.

Over the next six months National Grid is intending to obtain meter validation reports for the remaining NTS entry and exit facilities. The Meter Assurance team will use the data provided in the reports to assist with the identification of causes of UAG and to inform the preparation of the meter witnessing campaign for 2017/18. The team is expecting to have additional resources available later this year to be able to increase the number of witnessing visits over the coming 12 months.

3.2 Reconciliation

National Grid has an obligation to reconcile NTS related meter and data errors on behalf of the shipping community.

Figure 5 provides the annual reconciliation quantities, in absolute energy terms, for Formula Years 2012/13 to 2016/17. The values provided in the figure for 2016/17 cover the 11 month period from 1st April 2016 to 28th February 2017. To date in 2016/17 National Grid has successfully processed 473.82 GWh of reconciliations in absolute terms. This comprises 101 instances of reconciliation at individual NTS exit facilities, each instance comprising of one or more days of reconciliation. This is almost as much energy as National Grid reconciled during 2015/16 when 56 instances of reconciliation were processed.

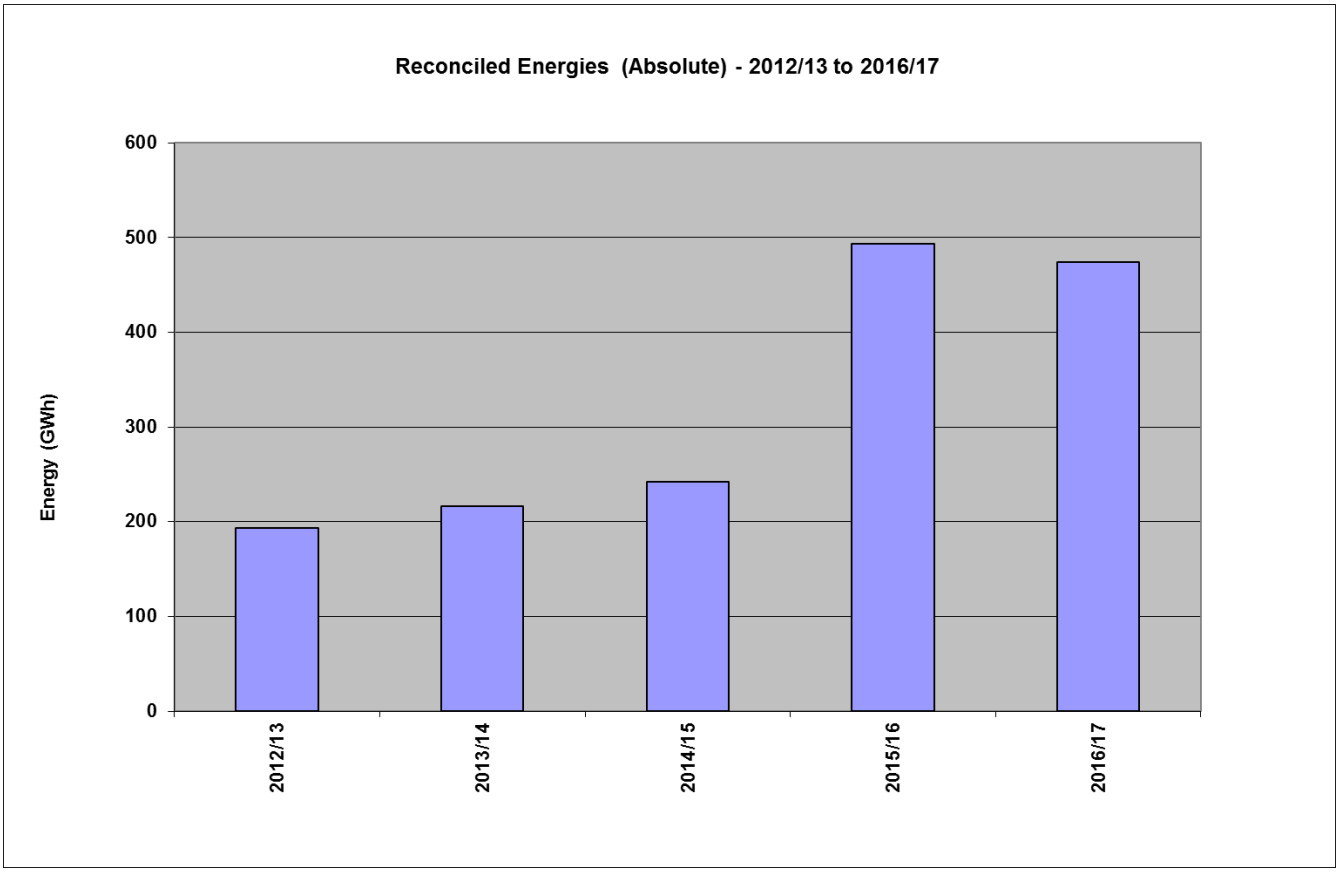

Figure 5: Reconciled energies (absolute) – 2012/13 to 2016/17

The vast majority of the reconciliations processed to date during 2016/17 relate to data errors associated with the implementation of the new Gas Control Suite (GCS) system that took place during July 2016.

Figure 6 provides the annual assessed UAG levels for Formula Years 2012/13 to 2016/17 compared with the annual reconciliation quantities, in absolute terms, for this period. The values provided in the figure for 2016/17 cover the period from 1st April 2016 to 28th February 2017.

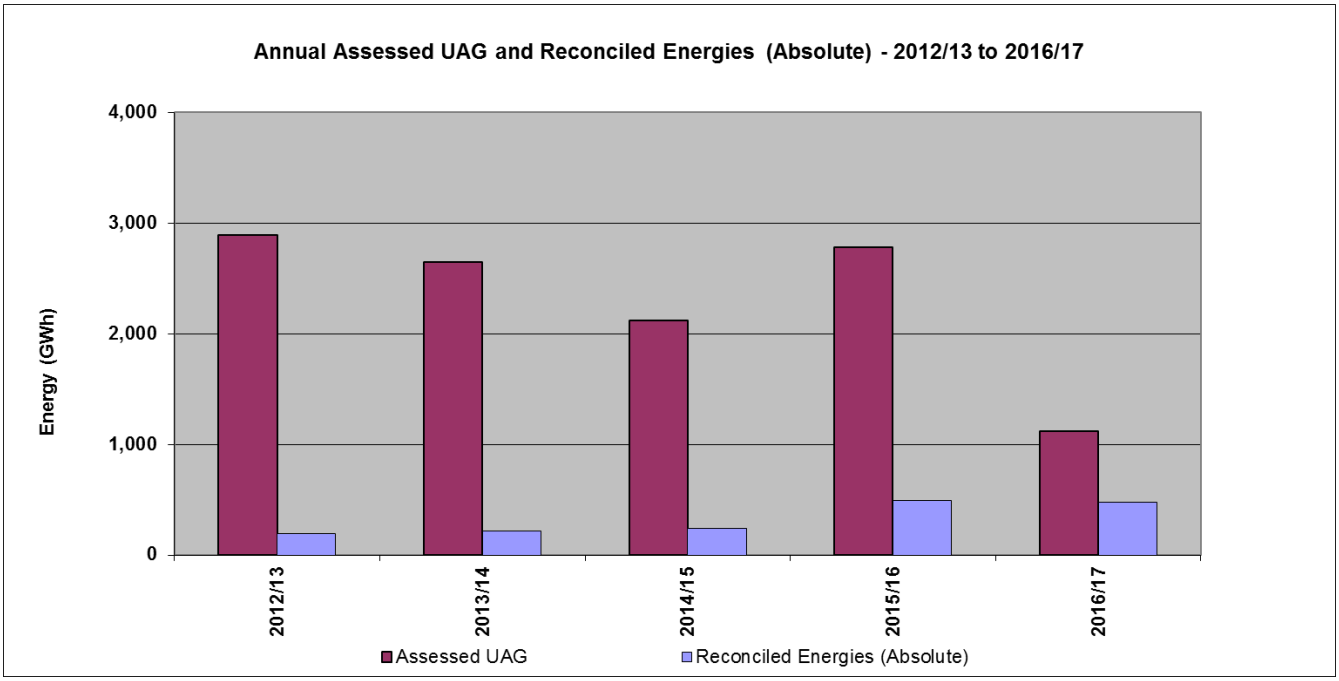

Figure 6: Annual assessed UAG and reconciled energies (absolute) – 2012/13 to 2016/17

Figure 6 demonstrates an upward trend in the amount of energy reconciled by National Grid over the past five years whilst a downward trend in the annual assessed UAG has been observed over the same period.

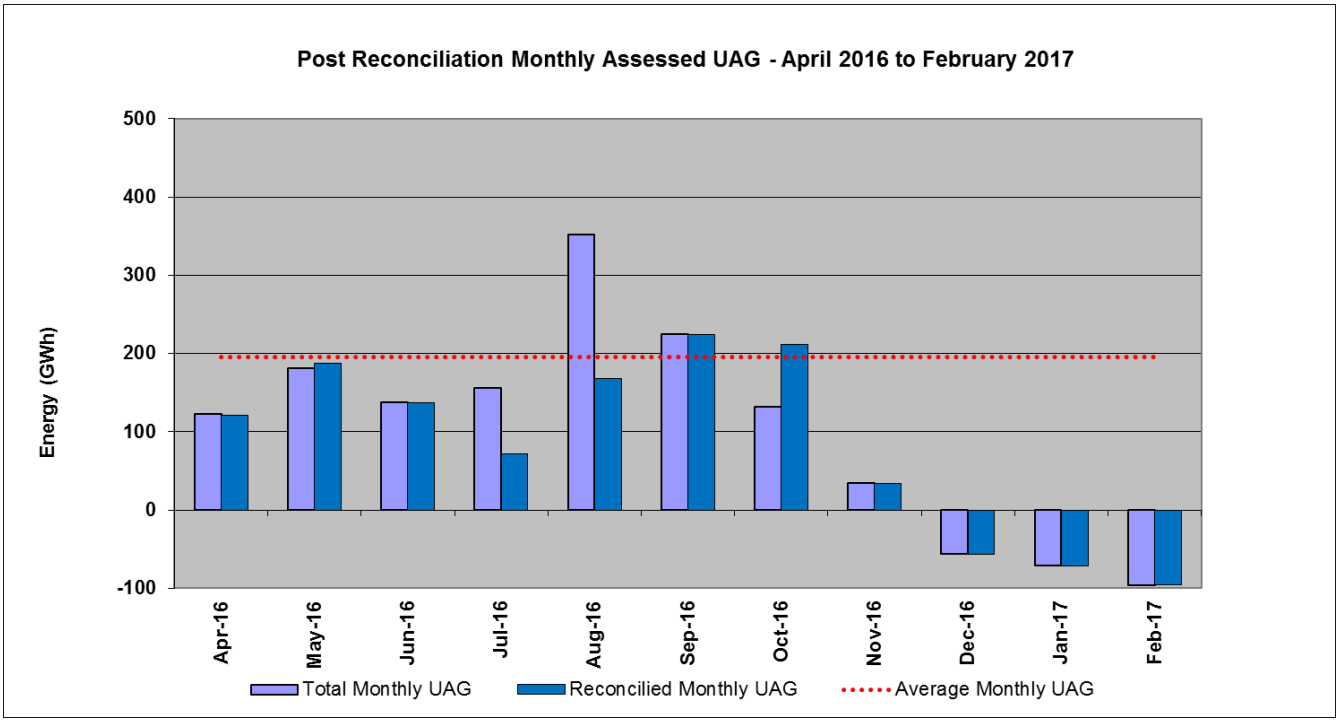

Figure 7: Post reconciliation monthly assessed UAG – April 2016 to February 2017

Figure 7 provides the total monthly assessed UAG from April 2016 to February 2017 and the long term average monthly assessed UAG, previously seen in Figure 2, together with the total monthly assessed UAG for the same period recalculated to take account of the reconciliations that have been processed by National Grid during 2016/17.

It can be observed from the figure that the post reconciliation monthly assessed UAG is significantly lower for July and August 2016 and significantly higher for October 2016. The recalculated monthly assessed UAG quantities for July and August are both more than 50% less than the pre-reconciliation UAG quantities. This indicates the impact on UAG of the data errors associated with the implementation of GCS.

The recalculated monthly assessed UAG quantity for October is more than 60% higher than the pre-reconciliation UAG quantity. This indicates that the substantial reduction in total monthly assessed UAG since October 2016 referred to earlier in this report appears to have actually begun later when taking account of the reconciliations carried out to date. This information will assist National Grid in its investigations into the causes of these unusually low levels of UAG.

National Grid is currently processing a further 18 data and meter reconciliations which will be included in future Unaccounted for Gas Reports. Over the next six months National Grid is planning to undertake further analysis on completed reconciliations to be able to provide further detail in future reports on the impact of reconciliations on assessed UAG. National Grid will also process as much reconciliation as possible.

3.3 NGage Meter Validation Application

NGage is the meter validation and analysis application for use on iOS or Android devices. This is being developed by National Grid and will be made available free of charge to meter asset owners and the third party organisations they contract to carry out metering validation activities on their behalf. NGage is designed to facilitate the collection of meter validation data, in accordance with the current meter validation standard (T/PR/ME/2), and provision of this information to National Grid. The application will automatically upload the results of meter validations to a secure data portal which will enable improved analysis of these results which will be available to both National Grid and the asset owner.

Development of version 2.0 of NGage has now been completed with extensive user testing taking place over the past 6 months. Final testing is expected to be completed during March with release of version 2.0 of the application expected immediately afterwards.

Development of version 2.0 of National Grid's gas property and flow calculator application, NGageCalc, has also been completed and tested. Version 1.0 of NGageCalc is currently available via the iTunes App Store or Google Play Store.

Over the coming months National Grid are planning to release versions 2.0 of the NGage and NGageCalc applications to meter asset owners. National Grid will support meter asset owners in using these applications during their meter validations scheduled for 2017/18. Use of the NGage meter validation application will assist National Grid in efficiently obtaining up to date meter validation reports as discussed in section 3.1 of the report. The data provided in the reports will be used to assist with the identification of causes of UAG and to inform the preparation of the meter witnessing campaign for 2017/18.

3.4 Baseline UAG Analysis

An independent assessment of the baseline level of UAG, which could be expected from the network operating under normal measurement uncertainties, is being undertaken by Manchester University's mathematics department. As discussed in section 2 of the report National Grid currently uses legacy UAG baseline values of ±20 GWh as triggers to investigate potentially high levels of positive or negative UAG. This study is expected to provide a more dynamic UAG baseline quantity which will assist in the future management of UAG. It is also expected to provide a range of improved mathematical methods for identifying potential causes of UAG.

A PhD student has begun work on the baseline analysis. Using an anonymised data set provided by National Grid, Manchester University subjected the data to a range of analytical methods including change point analysis. This analysis was able to identify a number of significant, known meter errors that were included within the data.

Further work on change point analysis is planned, including an analysis of the current time period where negative UAG is being experienced. It is hoped that this analysis will lead to the creation of a number of web applications that National Grid will be able to incorporate into their day to day investigations into UAG.

3.5 Day to Day UAG Analysis

Meter Assurance, who are part of the Energy Balancing team within National Grid's UK System Operator directorate, are responsible for investigating the causes of and reporting upon UAG.

Over the past 6 months the Meter Assurance team has been making use of Lean techniques to review how it monitors and investigates UAG with particular emphasis on the investigation of high levels of positive or negative UAG during the energy balancing pre-closeout period. During this period identified data errors can be corrected without recourse to reconciliation. The team has developed a number of new key performance indicators to assist their daily investigations into UAG.

In addition to the Baseline UAG Analysis work being undertaken by Manchester University, the Meter Assurance team has also been undertaking work to enhance their ability to identify potential causes of UAG. This work initially focussed on the team's ability to investigate causes of UAG on those days when UAG exceeded ±20 GWh but was subsequently refocused on the team's ability to investigate the high levels of negative UAG currently being experienced. Some progress has been made to date with the team incorporating notification data provided by operators of NTS entry and exit facilities and Gas National Control Centre SCADA data into their analyses.

Over the coming months the team are planning to continue their work on enhancing their current suite of tools used to investigate UAG. This is expected to assist with the day to day management of UAG. They are also hoping to make use of the additional data and functionality that is being made available within the Gas Control Suite system.

3.6 Ongoing Development of Gas Control Suite

At the end of July 2016 National Grid implemented its new Gas Control Suite system. This replaced the existing Integrated Gas Management System and is the system used to control the physical and commercial operation of the NTS. One of the roles of GCS is to facilitate the validation of end of day measurements for system inputs to the NTS and system outputs from the NTS. This information is passed to Gemini which is the system used for customer billing purposes. GCS also calculates the energy balance for the NTS which is used to manage assessed NTS shrinkage and UAG quantities.

As discussed in section 3.2 of the report, there were a number of unexpected data errors associated with the implementation of GCS which have impacted the UAG values provided in this report for July and August 2016. National Grid has processed all the identified data errors associated with the implementation of GCS.

The Meter Assurance team has worked closely with the GCS development team since implementation to ensure that the best available data is used by the system to calculate UAG and additional data is made available to assist the day to day management of UAG. A project has recently started to design new functionality within GCS which, amongst other improvements, should result in the automated recalculation of UAG when reconciliation occurs. This is expected to result in additional time becoming available to the team to use investigating the causes of UAG.

Over the coming months the Meter Assurance team will continue to work with the GCS development team to exploit the additional data and new analytical tools that GCS will provide.

4. Conclusion

Over the past six months assessed UAG has reduced significantly. The total monthly assessed UAG quantities for September 2016 to February 2017 are all less than for the equivalent months of 2015/16. In addition for 5 of the last 6 months total monthly assessed UAG has been less than the long term average monthly assessed UAG. Moreover, total monthly assessed UAG has been negative for the months of December 2016, January 2016 and February 2017. The quantities of negative UAG observed during the period covered by this report have not been seen in over 10 years. National Grid is continuing to investigate the causes of this negative UAG. These investigations are the focus of the Meter Assurance team's current activities.

It is expected that for Formula Year 2016/17 annual assessed UAG will be significantly less than for Formula Year 2015/16 and will support the decline in annual quantities observed since 2009/10. It is also expected that National Grid will process almost as much meter/data error reconciliation, in absolute energy terms, as was reconciled during 2015/16. This again supports the upward trend in the amount of energy reconciled by National Grid over the past five years whilst a downward trend in the annual assessed UAG has been observed over the same period.

Development of the NGage and NGageCalc applications has now been completed with the release of version 2.0 of the applications to meter asset owners expected to take place during April 2017.

Progress has been made on the determination of UAG following meter/data error reconciliation and on enhancing National Grid's analytical capability to support its ongoing work into the investigation of the causes of UAG. This includes the continued development of the Gas Control Suite system.

Good progress has also been made on obtaining and reviewing meter validation information for NTS entry and exit facilities. This data is being used to assist with the identification of causes of UAG and to inform the release of the NGage application and the preparation of the meter witnessing campaign for 2017/18.

Appendix I - National Grid Gas Plc (NTS) Gas Transporter Licence Special Condition 8E

Special Condition 8E: Requirement to undertake UAG Projects to investigate the causes of Unaccounted for Gas (UAG)

Introduction

8E.1 The purpose of this condition is to set out the obligations of the Licensee in respect of undertaking projects for the purposes of investigating the causes of Unaccounted for Gas (UAG) and the publication of the findings of these projects, including relevant data.

Part A: Licensee's obligations under this condition

8E.2 The Licensee shall use reasonable endeavours to undertake the UAG Projects as specified in this condition for the purposes of investigating the causes of Unaccounted for Gas in respect of Formula Year t commencing on 1 April 2013 and each subsequent Formula Year t until 31 March 2021. The UAG Projects shall include but need not be limited to those set out in paragraph 8E.5. Where the Licensee does not undertake certain UAG Projects it shall clearly set out its reasoning in the UAG Reports referred to in paragraph 8E.3.

8E.3 The Licensee shall publish UAG Reports of the findings of these UAG Projects on its website and provide a copy of the UAG Reports to the Authority. The Licensee shall publish the UAG Reports by 1 May 2013, 1 October 2013 and every subsequent six months thereafter or such other dates as agreed by the Authority.

8E.4 Within one month of publishing a UAG Report the Licensee shall publish on its website all the relevant data referred to in the UAG Report. Where there are legitimate reasons for not publishing certain data on the website the Authority may consent for the Licensee not to do so.

Part B: Interpretation

8E.5 For the purposes of this condition:

UAG Projects	means the projects currently undertaken by the Licensee including: (a) the witnessing by the Licensee of the validation of Measurement Equipment at NTS System Entry Points or Supply Meter Installations at NTS Exit Points; and (b) investigation and analysis of data in order to seek to identify causes of UAG.

UAG Report	means the report of the findings of the UAG Projects undertaken by the Licensee. The UAG Report shall detail the UAG Projects the Licensee has undertaken in the previous period, the UAG Projects it proposes to undertake in the next period and the Licensee's views on whether, and if so how, the findings of the UAG Projects may be taken forward in order to reduce the volume of UAG. The UAG Report shall also detail the reasons why any UAG Projects that the Licensee proposed to undertake have not been undertaken. The UAG Report shall summarise any relevant discussion concerning UAG at industry fora and with interested parties on a one-to-one basis.
Unaccounted for Gas (UAG)	means the amount of gas (GWh) that remains unaccounted for after the Entry Close-out Date following the assessment of NTS Shrinkage performed in accordance with the network code.
Measurement Equipment; NTS System Entry Points; Supply Meter Installations; NTS Exit Points; Entry Close-out Date; NTS Shrinkage	shall bear the same meanings as are given to those terms in the network code.

Appendix II – Relevant Data Referred to in April 2017 Unaccounted for Gas Report

This appendix provides the relevant data used to prepare the figures and tables provided in the report. The assessed and estimated UAG, OUG and CVS values used in the figures and tables are calculated from daily assessed values published on the National Grid website.

Figure 1:

Formula Year	Annual assessed UAG (GWh)	2016/17 UAG Estimate (GWh)
2012/13	2,894	-
2013/14	2,648	-
2014/15	2,121	-
2015/16	2,782	-
2016/17	1,117	104

The annual assessed UAG for 2016/17 covers the period 1st April 2016 to 28th February 2017.

Figure 2:

Month	Total monthly assessed UAG (GWh)	Average monthly assessed UAG (GWh)
Apr-12	262.58	195.98
May-12	233.65	195.98
Jun-12	244.78	195.98
Jul-12	273.52	195.98
Aug-12	306.51	195.98
Sep-12	215.15	195.98
Oct-12	242.31	195.98
Nov-12	242.43	195.98
Dec-12	226.80	195.98
Jan-13	266.69	195.98
Feb-13	204.76	195.98
Mar-13	175.04	195.98
Apr-13	337.54	195.98
May-13	220.69	195.98
Jun-13	266.17	195.98
Jul-13	283.19	195.98
Aug-13	72.18	195.98
Sep-13	186.56	195.98

Month	Total monthly assessed UAG (GWh)	Average monthly assessed UAG (GWh)
Oct-13	184.75	195.98
Nov-13	254.88	195.98
Dec-13	193.15	195.98
Jan-14	235.28	195.98
Feb-14	210.38	195.98
Mar-14	203.22	195.98
Apr-14	150.50	195.98
May-14	200.90	195.98
Jun-14	197.26	195.98
Jul-14	284.19	195.98
Aug-14	197.98	195.98
Sep-14	256.67	195.98
Oct-14	223.58	195.98
Nov-14	154.41	195.98
Dec-14	179.73	195.98
Jan-15	84.50	195.98
Feb-15	81.31	195.98
Mar-15	110.23	195.98
Apr-15	70.99	195.98
May-15	153.27	195.98
Jun-15	84.29	195.98
Jul-15	209.38	195.98
Aug-15	437.92	195.98
Sep-15	283.13	195.98
Oct-15	313.53	195.98
Nov-15	431.57	195.98
Dec-15	296.88	195.98
Jan-16	183.12	195.98
Feb-16	120.94	195.98
Mar-16	197.22	195.98
Apr-16	123.12	195.98
May-16	181.75	195.98
Jun-16	137.99	195.98
Jul-16	156.16	195.98
Aug-16	352.22	195.98
Sep-16	224.58	195.98
Oct-16	131.52	195.98
Nov-16	33.89	195.98
Dec-16	-56.41	195.98
Jan-17	-71.49	195.98
Feb-17	-96.07	195.98

Figure 3:

Month	Total monthly assessed UAG (GWh)	Month	Total monthly assessed UAG (GWh)
Sep-15	283.13	Sep-16	224.58
Oct-15	313.53	Oct-16	131.52
Nov-15	431.57	Nov-16	33.89
Dec-15	296.88	Dec-16	-56.41
Jan-16	183.12	Jan-17	-71.49
Feb-16	120.94	Feb-17	-96.07

Figure 4:

Daily assessed UAG values are published on the National Grid website via the following link: http://www2.nationalgrid.com/uk/industry-information/gas-transmission-system-operations/balancing/unaccounted-for-gas/.

The upper and lower baseline UAG quantities seen in Figure 4 are respectively +20 GWh and -20 GWh.

Figure 5:

Formula Year	Number of instances of reconciliations	Reconciled energy (absolute) (GWh)
2012/13	64	193.65
2013/14	45	216.49
2014/15	45	241.98
2015/16	56	493.21
2016/17	101	473.82

2016/17 covers the period 1st April 2016 to 28th February 2017.

Figure 6:

Formula Year	Annual assessed UAG (GWh)	Reconciled energy (absolute) (GWh)
2012/13	2,894	193.65
2013/14	2,648	216.49
2014/15	2,121	241.98
2015/16	2,782	493.21
2016/17	1,117	473.82

2016/17 covers the period 1st April 2016 to 28th February 2017.

Figure 7:

Month	Total monthly assessed UAG (GWh)	Reconciled monthly assessed UAG (GWh)	Average monthly assessed UAG (GWh)
Apr-16	123.12	121.56	195.98
May-16	181.75	187.04	195.98
Jun-16	137.99	136.60	195.98
Jul-16	156.16	72.01	195.98
Aug-16	352.22	168.31	195.98
Sep-16	224.58	224.58	195.98
Oct-16	131.52	211.44	195.98
Nov-16	33.89	33.89	195.98
Dec-16	-56.41	-56.64	195.98
Jan-17	-71.49	-71.49	195.98
Feb-17	-96.07	-96.07	195.98