

VERITEK

Gas Downstream Reconciliation Performance Audit Final Report

For

OnGas



Prepared by Steve Woods – Veritek Ltd

Date of Audit: 18/03/14 & 19/03/14

Date Audit Report Complete: 06/06/14

Executive Summary

This Performance Audit was conducted at the request of the Gas Industry Company (GIC) in accordance with Rule 65 of the 2013 Amendment Version of the Gas (Downstream Reconciliation) Rules 2008.

The purpose of this audit is to assess the systems, processes and performance of OnGas in terms of compliance with these rules.

The audit was conducted in accordance with terms of reference prepared by the GIC, and in accordance with the "Guideline note for rules 65 to 75: the commissioning and carrying out of performance audits and event audits, V3.0" which was published by GIC in June 2013.

The summary of report findings in the table below shows that OnGas's control environment is "effective" for fourteen of the areas evaluated and "adequate" for the other three. There were no areas that were considered "not adequate".

Thirteen of the seventeen areas evaluated were found to be compliant. Four breach allegations are made in relation to the remaining areas. They are summarised as follows:

1. The use of an incorrect altitude figure for one ICP has led to the over recording of consumption information by approximately 2.4%
2. Consumption information has been calculated using the incorrect gas type, leading to over-submission for one ICP by 38GJ (0.31%).
3. The initial submission accuracy did not meet the 10% requirement for some gas gates for the period January 2012 to December 2012.
4. The GAS070 file sent in October 2013 contained quantities for the incorrect month. All other months were correct.

In their response to the draft audit report, OnGas advised that points 1, 2 and 4 have been resolved and point 3 has already been raised as a breach by the market administrator.

Summary of Report Findings

Issue	Section	Control Rating (Refer to Appendix 1 for definitions)	Compliance Rating	Comments
ICP set up information	2.1	Adequate	Not compliant	Time delays exist with the registry update systems and processes. The incorrect altitude figure is used for one ICP.
Metering set up information	2.2	Effective	Compliant	I recommend a monthly validation of meter pressure and dials with all meter owners.
Billing factors	2.3	Adequate	Compliant	I recommend the temperature data is refreshed to ensure it is accurate and I recommend adjustment for the Joule Thompson effect.
Archiving of reading data	3.1	Effective	Compliant	I recommend meter reading files be zipped and password protected as a minimum to ensure their security and integrity.
Meter interrogation requirements	3.2	Effective	Compliant	Robust controls are in place for the management of meter interrogation requirements.
Meter reading requirements	3.3	Effective	Compliant	Meter reading attainment processes are robust.
Non TOU validation	3.4	Effective	Compliant	A minor recommendation is made in relation to the "high/low" settings at hand-held level.

Issue	Section	Control Rating (Refer to Appendix 1 for definitions)	Compliance Rating	Comments
Non TOU error correction	3.5	Effective	Compliant	The error correction processes are robust.
TOU validation	3.6	Effective	Compliant	TOU validation processes include appropriate steps to ensure accuracy.
Energy consumption calculation	4	Adequate	Not compliant	The calculation is performed correctly; however consumption information using the incorrect gas type, leading to over-submission for one ICP by 38GJ (0.31%).
TOU estimation and correction	5.1	Effective	Compliant	OnGas has robust processes for estimation and correction.
Provision of retailer consumption information	5.2	Effective	Compliant	The process for preparing consumption information files is robust and compliant.
Initial submission accuracy	5.3	Effective	Not compliant	The quantity of forward estimates is very low. Although compliance has not been achieved, the process is robust.
Forward estimates	5.4	Effective	Compliant	OnGas conducts meter reading during a one-week window at the end of each month and on most occasions achieves 100% of meter readings during this period.
Historic estimates	5.5	Effective	Compliant	Compliance was achieved for all of the scenarios provided during the audit.

Issue	Section	Control Rating (Refer to Appendix 1 for definitions)	Compliance Rating	Comments
Proportion of HE	5.6	Effective	Compliant	Reporting has been provided as required.
Billed vs consumption comparison	5.7	Effective	Not compliant	<p>OnGas's consumption information submitted to the allocation agent is higher than the billed information by 0.06% for the 25-month period ending November 2013.</p> <p>The GAS070 file sent in October 2013 contained quantities for the incorrect month. All other months were correct.</p>

Persons Involved in This Audit

Auditor:

Steve Woods
Veritek Limited

OnGas personnel assisting in this audit were.

Name	Title
Jonathan Baker	Operational Analyst
Graeme Sherrard	Retail Analyst

Service providers assisting with processes within the audit scope.

Company	Processes
Wells Instrument & Electrical Services Ltd	Gathering and storing raw meter data and TOU downloads
Vector Limited	Gathering and storing raw meter data and TOU downloads
AMS	Gathering and storing raw meter data and TOU downloads
GasNet	Gathering and storing raw meter data and TOU downloads

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1. Pre-Audit and Operational Infrastructure Information

1.1 Summary of Previous Audit

OnGas provided a copy of their previous audit conducted in 2011 by Veritek Ltd. Eleven of the seventeen areas evaluated were found to be compliant. Five breach allegations were made in relation to the remaining areas. The resolution of these matters is summarised in the table below.

Breach Allegation	Rule	Section in this report	Resolution
The use of altitude figures derived from the altitude of the relevant gas gate has led to the submission of incorrect consumption information for 20 ICPs.	26.2.1 & 28.2	2.1.2	Resolved
The use of incorrect meter pressure information has led to the over submission of consumption information to the allocation agent of approximately 1,111GJ for a thirteen month period.	26.2.1, 26.3 & 28.2	2.2, 3.5 & 5.2	Resolved
Estimated TOU consumption information has been provided on a number of occasions from May 2009 to December 2010. OnGas's processes achieve compliance with the requirement to provide its "best estimate of consumption information"; however, the existence of estimated information is considered a matter of non-compliance. This issue is addressed on a monthly basis.	30.3	5.1	No longer applicable. The rules now allow estimates to occur
OnGas's's initial submission accuracy did not meet the 15% requirement for every gas gate for the period October 2008 to December 2009.	37.2	5.3	The threshold is now 10% and OnGas has not met this for some gas gates.
Three of five historic estimate scenarios were not calculating or apportioning consumption information correctly. This matter is now resolved.	35	5.5	Resolved

1.2 Scope of Audit

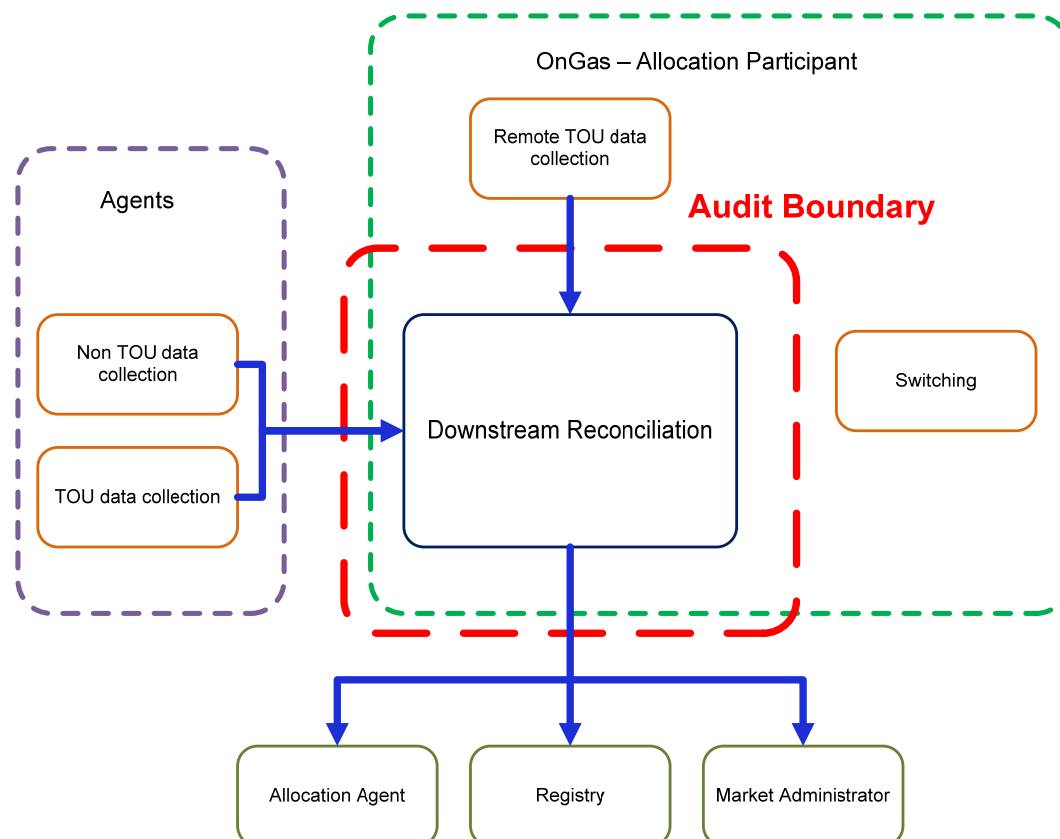
This Performance Audit was conducted at the request of GIC in accordance with Rule 65 of the 2013 Amendment Version of the Gas (Downstream Reconciliation) Rules 2008. Rule 65 is inserted below:

65. Industry body to commission performance audits
- 65.1 The industry body must arrange at regular intervals performance audits of the allocation agent and allocation participants.
- 65.2 The purpose of a performance audit under this rule is to assess in relation to the allocation agent or an allocation participant, as the case may be, -
- 65.2.1 The performance of the allocation agent or that allocation participant in terms of compliance with these rules; and
- 65.2.2 The systems and processes of the allocation agent or that allocation participant that have been put in place to enable compliance with these rules.

The audit was conducted in accordance with terms of reference prepared by GIC, and in accordance with the “Guideline note for rules 65 to 75: the commissioning and carrying out of performance audits and event audits, V3.0” which was published by GIC in June 2013.

The audit was carried out on March 18th 2014 at OnGas’s offices in Wellington and March 27th at the Hamilton office.

The scope of the audit includes “downstream reconciliation” only, as shown in the diagram below. Switching, metering ownership and data collection functions are not within the audit scope.



1.3 Audit Approach

As mentioned in Section 1.1 the purpose of this audit is to assess the performance of OnGas in terms of compliance with the rules, and the systems and processes that have been put in place to enable compliance with the rules.

This audit has examined the effectiveness of the controls OnGas has in place to achieve compliance, and where it has been considered appropriate sampling has been undertaken to determine compliance.

Where sampling has occurred, this has been conducted using the Auditing Standard 506 (AS-506) which was published by the Institute of Chartered Accountants of New Zealand. I have used my professional judgement to determine the audit method and to select sample sizes, with an objective of ensuring that the results are statistically significant.¹

Where calculations are performed by OnGas' systems, the algorithm has been checked by using one or two examples as a "sample". Multiple examples are not required because they will not introduce any different variables.

Where compliance is reliant on manual processes, manual data entry for example, the sample size has been increased to a magnitude that, in my judgement, ensures the result has statistical significance.

Where errors have been found or processes found not to be compliant the materiality of the error or non-compliance has been evaluated.

¹ In statistics, a result is considered statistically significant if it is unlikely to have occurred by chance. (Wikipedia)

1.4 General Compliance

OnGas has 280 alleged breaches recorded by the Market Administrator since February 2011. They are summarised in the table below.

Nature of Breach	Rule	Quantity	Section in this Report
Switching Breaches		12	Not within audit scope
Submission of estimated TOU data	30.3 31.1, 32.1 & 33.1	198	5.1
Initial vs final allocation variances more than the allowable threshold	37.2	49	5.3
Late submission	31 & 32	13	5.2
Incorrect volume conversion	28.2	2	2.2
Late trading notification	39.2.3	2	
Inaccurate or incomplete information	26.2	2	2.2
Incorrect HE calculations	35	1	5.5
Validated meter reading report not provided	40.2	1	3.3

The market administrator considers ten of the alleged breaches to be “material”. Two of them were raised in the previous performance audit report and were in relation to the use of incorrect meter pressure. The remaining eight material breaches were due to initial vs final allocation variances. This matter is discussed in Section 5.3.

As noted in the Summary of Report Findings, this audit has found four areas of non-compliance. The following breach allegations are made in relation to these matters.

Breach Allegation	Rule	Section in this report
The use of an incorrect altitude figure for one ICP has led to the over recording of consumption information by approximately 2.4%	26.2.1 & 28.2	2.1.2
Consumption information has been calculated using the incorrect gas type, leading to over-submission for one ICP by 38GJ (0.31%).	26.2.1 & 28.2	4
The initial submission accuracy did not meet the 10% requirement for some gas gates for the period January 2012 to December 2012.	37.2	5.3
The GAS070 file sent in October 2013 contained quantities for the incorrect month. All other months were correct.	52.2.1	5.7

1.5 Provision of Information to the Auditor (Rule 69)

In conducting this audit, the auditor may request any information from OnGas, the allocation agent and any allocation participant.

Information was provided by OnGas in a timely manner in accordance with this rule.

Information was requested by OnGas from metering equipment owners and was provided within the requested timeframe. I consider that all parties have complied with the requirements of this rule.

1.6 Draft Audit Report Comments

A draft audit report was provided to the industry body (GIC), the allocation agent, and allocation participants that I considered had an interest in the report. In accordance with rule 70.3 of the Gas (Downstream Reconciliation) Rules 2008, those parties were given an opportunity to comment on the draft audit report and indicate whether they would like their comments attached as an appendix to the final audit report. I received a response from OnGas. Their comments were considered in accordance with rule 71.1, prior to preparing the final audit report. As a result of the comments received, I have included a statement in the executive summary that OnGas has resolved the matters where breach allegations were made.

1.7 Transmission Methodology and Audit Trails (Rule 28.4.1)

A complete audit trail was viewed for all data gathering, validation and processing functions. This rule requires that "The consumption information supplied to the allocation agent in accordance with rules 29 to 40 is transferred in such a manner that it cannot be altered without leaving a detailed audit trail..." Compliance is confirmed with this rule in relation to consumption information supplied to the allocation agent; however, TOU and non TOU data collection agents send monthly "text" files as email

attachments. This method is not considered secure and I recommend these files be zipped with password protection to ensure their security during transmission. This recommendation was also made during the previous audit.

2. Set-up and Maintenance of Information in Systems (Rule 28.2)

Every retailer must ensure the conversion of measured volume to volume at standard conditions and the conversion of volume at standard conditions to energy complies with NZS 5259:2004, for metering equipment installed at each consumer installation, for which the retailer is the responsible retailer.

Compliance with this rule has been examined in relation to the set-up of ICP, metering and billing information. I have also considered the “Gas (Downstream Reconciliation) Rules 2008 Billing factors guideline note, V1.0” (Billing Factors Guideline) published by GIC on 22/12/11 when examining the set up and maintenance of information.

2.1 ICP Set Up Information

2.1.1 New Connections Process

I examined the process for the connection and activation of new ICPs. OnGas relies on the registry notification at the time an ICP’s status is changed to “Ready” as their notification that the connection of an ICP is imminent. OnGas populates their system at this point and then awaits the provision of a meter docket to confirm the livening date and metering details. OnGas does not have a “proposed livening date” field in their system so monitoring to ensure the timely provision of meter dockets does not occur. There were ten new ICPs identified from the list file. I followed the process and examined the registry records for three of these ICPs and found the registry was updated with a change of status to ACTC more than five business days after the actual event date for three ICPs. The late provision of meter dockets was the cause in all cases.

During the previous audit, I recommended that OnGas obtain reporting from distributors of ICPs at “New” where they are the proposed retailer to enable them to establish and monitor proposed livening dates to minimise late notification and to ensure consumption information is provided to the allocation agent at the earliest opportunity. OnGas obtains a weekly report from the registry of ICPs at “Ready”. This enables monitoring to occur and achieves the outcome proposed in my recommendation from the last audit. Late provision of meter dockets remains an ongoing issue.

OnGas conducts a full validation of their system against the registry on a monthly basis to identify discrepancies. Meter pressure is validated against meter owner data on a monthly basis for AMS and periodically for Powerco and GasNet. I recommend monthly validation also occurs for Powerco and GasNet.

2.1.2 Altitude Information

During the previous audit, I recorded that OnGas used the altitude at each gas gate for all ICPs connected to that gate and I recommended the use of the data on the registry. OnGas adopted this recommendation and now uses the registry data.

NZS 5259:2004 Amendment No1, which was published in November 2009, contains the following requirements regarding the way that altitude information should be managed.

1. The maximum permissible error has been reduced from $\pm 1.5\%$ to $\pm 1.0\%$ where the meter pressure is below 100kPa and $\pm 0.5\%$ where the meter pressure is greater than 100kPa.
2. The following note is also included "To minimise uncertainty due to altitude factor the aim should be to determine the altitude to within 10m where practicable."

Altitude figures that are within approximately 90m of the actual altitude will ensure an accuracy of $\pm 1.0\%$. Altitude figures that are within approximately 45m of the actual altitude will ensure an accuracy of $\pm 0.5\%$.

I compared the altitude figures in Flow2E against the registry and Google Earth. I found a discrepancy with the figures for one ICP. Google Earth shows an altitude of 287m, whilst Flow2E and the Registry both show 10m. The meter pressure is 35 so the allowable threshold is 90m. This is likely to result in over recording of consumption information by 2.48%.

OnGas has identified some other discrepancies between Flow2E and the Registry and in most cases they have the correct figure in Flow2E. There are five ICPs where Flow2E has zero and the registry has figures between 10m and 50m. Whilst the difference in altitude is not greater than that allowed in points 1 and 2 above, I recommend OnGas updates the data in Flow2E.

The "google earth" data is based on the "Shuttle Radar Topography Mission" (SRTM) results and a number of recent studies indicate an accuracy of $\pm 10\text{m}$ for altitude. An evaluation against this data is considered an appropriate test for "reasonableness".

2.2 Metering Set-up Information

Meter pressure is validated against meter owner data on a monthly basis for AMS and periodically for Powerco and GasNet.

I compared the meter pressure recorded by OnGas against information provided by meter owners. This analysis showed there were no meter pressure discrepancies.

There is one ICP where OnGas records show a multiplier of 0.1. The meter docket confirms this is correct.

The invoices for some ICPs were checked where meter dial discrepancies exist and there does not appear to have been an effect on consumption information. The meter reading processes are designed to identify meter dial discrepancies that could affect meter reading accuracy. If the meter reader's hand held device is expecting more digits than the number of dials, then the reading is entered as normal and notification is made in the "readers notes" field for investigation. If the hand held is expecting fewer digits than the number of dials, then the reading is entered into the "readers

notes” field and once again an investigation is conducted. Although this “safety net” appears to be robust, I recommend that meter dials validation be conducted on a monthly basis with meter owners.

2.3 Billing Factors

2.3.1 Temperature Information

For ICPs where the actual temperature is not measured NZS 5259: 2004 states that temperature may be estimated and four methodologies are provided. These are listed below in order of decreasing preference.

- (a) Temperature records of the station under flowing conditions. Historical records can be used if similarity is preserved.
- (b) Records of actual gas temperature in similar installations over similar periods at similar locations may serve to estimate the value of gas temperature in the installation.
- (c) For compact installations directly connected to short risers and well shaded from direct sunlight, where the temperature of the gas is in the vicinity of ground temperature, the temperature may be estimated from the average ground temperature at 300mm depth. NOTE – Reliable and relevant climatic temperature data may be used as a basis for estimating average 300mm ground temperatures. This may include published data. For installations with seasonal use only, the data for the relevant season or seasons should be used.
- (d) For installations where the inlet pipes are exposed to ambient air conditions the temperature may be estimated from the mean temperature obtained at reliable and relevant weather recording stations. For installations with seasonal use only, the data for the relevant season or season should be used. The installation should be shielded from direct sunlight.

OnGas has chosen option (c) and they apply the daily weighted average temperature for the billing/read-read period. Option (c) seems to be the most logical choice because it matches the majority of GMS installations. OnGas has advised that the source of the data is a file from NIWA that was provided in approximately 1994. OnGas believes the temperature data contained in the file may be an average of ground and air temperatures. During the previous audit, I compared OnGas’s temperature data to data recently provided by NIWA and the figures used by OnGas appeared to be approximately 1.5°C to 2.0°C lower. OnGas is unsure if the data has been refreshed. I recommend OnGas refreshes this data and records the date this was done.

The Billing Factors Guideline contains the following expectations, which reinforce my recommendation.

- Retailers select weather stations relevant to the area supplied by each gas gate at which they are trading. Weather stations should have at least five years of historical ground temperature data at 300 mm depth.
- Retailers obtain daily or monthly average temperature data based on the previous five years of weather records for each chosen weather station.

- Retailers use daily or monthly average temperature data to construct average temperatures for billing and reconciliation purposes.
- Retailers refresh temperature data on a regular basis, at least every five years.

OnGas does not apply the Joule Thompson effect adjustment because network pressure information on the registry is not considered accurate. NZS 5259:2004 states "...correction may be made for the temperature drop due to pressure reduction if this reduction is made in the same installation and immediately upstream of the GMS. The temperature drop is about 0.5° per 100kPa of pressure drop. For large pressure drops or high flow rates it is recommended that the actual temperature drop be measured." This indicates that adjustment for the Joule Thompson effect is desirable.

The Billing Factors Guideline contains the following expectations by GIC:

- Network owners ensure nominal operating pressures are correctly populated in the registry for all ICPs on their networks.
- Once network pressures are correctly populated, retailers ensure that they account for the Joule- Thomson effect by using the network pressure in the registry in their conversions of metered volumes to standard volume, particularly in situations where failure to do so will result in conversion errors greater than those allowed in Table 3 of NZS5259.

This also reinforces that adjustment for the Joule Thompson effect is desirable.

I recommend that OnGas adjusts for the Joule Thompson effect.

2.3.2 Calorific Values

The gas composition data come directly from the Gas Chromatographs, via SCADA (the system that 'talks' to the Gas Chromatographs), then it is automatically upload to the Open Access Transmission Information System (OATIS) and Flow2E. The only manual intervention that takes place is if there is a clocked meter. In these cases, the SCADA file would not be accepted into OATIS, and a re-calculation and upload to OATIS would occur before validation.

The accuracy of this information was checked by comparing an OATIS file with the contents of Flow2E for some days in April 2014. The information in Flow2E was correct.

3. Meter Reading and Validation

3.1 Archiving of Register Reading Data (Rule 28.4.2)

Retailers are required to keep register reading data for a period of 30 months. Data was examined during the audit and it is confirmed that OnGas securely archives data for a period in excess of 30 months.

Some data provided by OnGas's meter reading contractor was checked and I found the readings matched the data in Kinetiq. This proves the end-to-end process. This data is transmitted as text files via email. I recommended these files are zipped and password protected as a minimum to ensure its security and integrity.

3.2 Retailer to Ensure Certain Metering Interrogation Requirements are Met (Rule 29)

This rule requires that for consumer installations where the actual or expected consumption is greater than 10TJ, a TOU meter will be installed and the installation will be assigned to allocation group 1 or 2. For consumer installations where the actual or expected consumption is between 250GJ and 10TJ a non-TOU meter will be installed and the installation will be assigned to allocation group 4.

OnGas conducts analysis of consumption on a monthly basis to ensure ICPs are in the correct allocation groups. The most recent report was reviewed which shows that all ICPs are in the appropriate allocation group.

3.3 Meter Reading Requirements (Rules 29.4.3, 29.5 & 40.2)

All consumer installations with non-TOU meters must have register readings recorded at least once every 12 months unless exceptional circumstances prevent such an interrogation.

OnGas provided a copy of the GAS080 report for December 2013, which shows that compliance has been achieved for both the rolling 4-month and 12-month targets.

The table below shows the GAS080 results for December 2013.

Target	Reading Percentage (GAS080)
Rolling 4 months (target 90%)	100%
12 months (target 100%)	100%

There was one breach allegation in October 2013 in relation to rule 40.2, which is the requirement to report the number and percentage of validated register readings obtained in accordance with rules 29.4.3 and 29.5.

3.4 Non TOU Validation

Meter reading validation occurs at multiple levels.

At source, the handheld data input devices perform a localised validation, to ensure that the reading is within expected high-low parameters. These parameters are set as a “high/low” limit, based on an agreed setting with OnGas. The “low” limit is set at the previous read. The “high” limit is set at the maximum reading possible depending on the number of dials, i.e. a 7-digit meter will have a “high” limit of 9999999. I consider the “low” setting to be appropriate, however I consider the “high” setting to be too broad and I recommend it is changed to a more reasonable figure that will identify potential meter reading errors.

Readings that fail this initial validation must be re-entered, and if the second reading is the same, it will be accepted; if it is different (indicating an error with the first reading) then it must be re-entered. Once the same reading has been entered twice consecutively, it will be accepted.

The second level of validation occurs when the data reaches OnGas. The readings are imported into a spreadsheet through a “vlookup” function. A volume calculation then occurs and this volume is manually compared to the volume from the previous month. If the volume appears to be different by a margin that is considered too large, then the volume is compared to the same month of the previous year, if this data is available. If the volume is still questionable, the matter is referred to the account manager to determine if the customer’s operation was different for the month.

The meter reading data is then loaded into Flow2E where the volume to energy calculation occurs. The energy figures are then loaded into Kinetiq, where billing occurs.

Each bill produced is checked manually before it becomes an “invoice”. This check is to determine if the energy and dollar amounts look reasonable in comparison to previous periods. Graphical reports are also checked over a period of up to five years.

Meter readings are not over written during this process, the original reading is retained even if it is not used. In most instances when a reading fails validation and an incorrect meter reading is suspected then a check reading will be performed.

3.5 Non TOU Error Correction

The process for error correction was examined to ensure that consumption information for prior consumption periods is included in the revision process and provided to the allocation agent.

Error correction is separate to invoice correction. Invoice correction occurs as a single line item that is either an additional amount or a refund. A spreadsheet containing the details of the calculation is created and saved in a directory as part of the audit trail.

Sometimes errors can be corrected by “scaling” in situations where an incorrect multiplier or factor was used. In other cases, the error correction involves estimation, for example if a meter has stopped.

The only examples available to examine were situations where estimated meter readings had been replaced with actual meter readings. This process operated as intended and the correct consumption information is apportioned to the correct months.

Whilst correction processes have a number of manual steps it appears to be conducted by skilled personnel and a “journal” is created and archived to ensure an appropriate audit trail is kept. The final step in the process is for the account manager to check and approve any corrections.

3.6 TOU Validation

TOU data is provided by OnGas’s TOU data collection agents as emailed text file attachments. These files are saved into a “received files” directory in Wellington and are also provided to the Flow2E system for the energy calculation. Some data is collected via telemetry using “Masterlink” software and some is downloaded manually.

Checks that were previously conducted in a spreadsheet based validation tool are now conducted in Flow2E.

The following checks are conducted:

- Missing data is checked by confirming the total number of hours in each file
- Temperature and pressure are checked to ensure they are within pre-defined limits.
- Volume is compared to pressure.
- Uncorrected values are corrected for pressure and temperature factors and the results compared to the corrected values.
- Invalid dates and times

Register reads are collected each month and a volume comparison is conducted in Kinetiq against the data in the TOU files.

The data is then viewed graphically to check it against previous months. The energy and dollar figures are checked against previous months. This check is repeated by the account manager for each ICP to ensure the energy and dollar amounts match those expected based on previous periods.

4. Energy Consumption Calculation (Rule 28.2)

The energy consumption calculation is now conducted in Flow2E. OnGas provided the results of their testing to confirm the calculation is correct. OnGas uses the AGA8 formula for super compressibility for all ICPs. The previous audit found that the Kinetiq calculation was using one too many days to calculate the average of calorific values for the “read to read” period. This matter is now resolved through the use of Flow2E rather than Kinetiq.

The small sample size for this comparison is considered appropriate because the calculation being evaluated is conducted entirely within OnGas’s system, with no manual intervention. Therefore, the only opportunity for error is if the incorrect factors are present within the system.

OnGas compares the gas gate records in their system against the registry to ensure consumption information is submitted to the allocation agent for the correct gas gates. The most recent report confirms gas gates are correct for submission purposes. The gas gate recorded in Flow2E is also compared to the registry and OnGas’s latest report shows six ICPs with the incorrect gas gate.

Further analysis found that CV and gas property values are derived from a separate ICP level field and not directly from the gas gate field. So although the gas gates were incorrect for six ICPs, the gas type was only different for three ICPs. The gas type should have been “R” but was recorded as “X”. An evaluation of the two gas types confirmed that the CV and gas property values were the same for the period Flow2E has been in production. Having confirmed that Flow2E used a different field than gas gate to identify gas type, a further check identified two ICPs where the incorrect gas type was being used for calculation purposes. One of the ICPs was using “X” instead of “R” and as mentioned above; the CV and gas properties are the same for these gas types. The other ICP was using “T” instead of “X”. This led to consumption information being over recorded by 38GJ (0.31%) for the period from November 2012 to March 2014. I have considered whether this matter constitutes non-compliance with NZS 5259:2004. Table 3 in Section 1.2.3.1 of NZS 5259:2004 contains an allowable permissible error of $\pm 0.25\%$ for compressibility conversion and the error of 0.31% is greater than that allowed. I have therefore concluded that OnGas has breached rule 28.2.

OnGas has resolved this matter immediately and intends to develop a monthly monitoring process to ensure the correct gas type is used for all ICPs.

5. Estimation and Submission Information

5.1 TOU Estimation and Correction (Rule 30.3)

This rule requires that retailers must provide the best estimate of consumption information to the allocation agent in situations where actual data is not available.

In these situations, OnGas uses the volume, temperature and pressure profiles from similar time periods to create estimates, which are appropriately identified.

Five examples were examined. The data was missing and needed to be estimated based on previous periods for two examples. The other three examples involved corrector failure. The total volume was available from a register reading and this was apportioned into the appropriate periods based on information from an equivalent period.

In all cases the data was correctly identified as estimated and an appropriate journal was available that showed the details of the estimation technique. An “estimates tracking” spreadsheet is used to ensure subsequent revisions are correct and correctly identified.

A final check is conducted by the account manager for all corrections and estimations.

5.2 Provision of Retailer Consumption Information (Rules 30 to 33)

OnGas’s compliance with rules 30 to 33 was examined by a “walk through” of their processes and controls to confirm compliance.

A GAS040 file for August 2013 was examined and compared to the data in OnGas’s system at ICP level; the totals matched which confirms compliance. This also proves that OnGas’s consumption information provided to the allocation agent is calculated at ICP level and then aggregated.

The matter of “vacant consumption” was also examined. OnGas’s meter reading and submission processes will continue as normal for ICPs that are vacant. There are currently no ICPs with this status.

Each month a check is conducted to ensure all ICPs contained in the list file have an associated record in the one of the files that make up the GAS040 and GAS050 files. There is also a check at gas gate level to ensure the volume looks correct compared to previous months.

5.3 Initial Submission Accuracy (Rule 37.2)

Final allocations were examined for the months January 2012 to December 2012. Rule 37.2 requires that the accuracy of consumption information, for allocation groups 3 to 6, for initial allocation must be within a certain percentage of error published by the industry body. The published percentage error is 10%.

OnGas met this requirement for a number of months during the 12 month period shown. The results are summarised in the table below.

Month	% Error	Total Gas Gates	Number Within +/- 10%	% Compliant
January 2012	10%	43	40	93%
February 2012	10%	42	40	95.2%
March 2012	10%	42	39	92.8%
April 2012	10%	42	40	95.2%
May 2012	10%	42	41	97.6%
June 2012	10%	42	41	97.6%
July 2012	10%	42	41	97.6%
August 2012	10%	42	41	97.6%
September 2012	10%	42	42	100%
October 2012	10%	42	42	100%
November 2012	10%	43	43	100%
December 2012	10%	44	44	100%

The following table shows the difference between consumption information for initial and final submissions at an aggregated level for all gas gates.

Month	Initial Submission All Gas Gates (GJ)	Final Submission All Gas Gates (GJ)	Percentage Variation
January 2012	65,804	65,426	-0.58%
February 2012	62,536	62,480	-0.09%
March 2012	72,589	72,121	-0.65%
April 2012	71,188	70,597	-0.84%
May 2012	72,936	71,914	-1.42%
June 2012	57,649	56,678	-1.71%
July 2012	50,074	48,933	-2.33%
August 2012	80,196	79,390	-1.01%
September 2012	82,208	82,306	0.12%
October 2012	80,889	79,797	-1.37%
November 2012	75,797	75,964	0.22%
December 2012	65,958	65,637	-0.49%

The table above shows that the variation between initial and final submissions is very small in most cases. OnGas conducts meter reading during a one-week window at the end of each month and on most occasions achieves 100% of meter readings during this period. This reduces the quantity of forward estimates in their submission files.

5.4 Forward Estimates (Rules 34 & 36)

The rules do not prescribe how forward estimates are to be calculated. As mentioned in the Section above, OnGas's submission files contain a very small quantity of forward estimates. These are calculated as a "flat" projection of the actual consumption (historic estimate) for the month.

5.5 Historic Estimates (Rules 34 & 35)

To assist with determining compliance of the historic estimate processes, OnGas was supplied with a list of scenarios. For each scenario, a manual calculation was performed, and this was compared to the calculation performed in OnGas's system. For one scenario the interim submission data and therefore the relevant seasonal adjustment shape file, was used in the comparison. This test also proves that the correct shape file is used.

Six of the scenarios had occurred and compliance is confirmed for them all. The previous audit identified some scenarios that were not calculating correctly. These matters have all been resolved.

Test	Scenario	Test Expectation	Result
A	ICPs become inactive part way through a month.	Consumption is only calculated for the Active portion of the month.	Compliant
B	ICPs become active then inactive within a month.	Consumption is only calculated for the Active portion of the month.	Has not occurred
C	ICPs become inactive, then active, then inactive again within a month.	Consumption is only calculated for the Active portion of the month.	Has not occurred
E	ICPs start on the 1 st day of a month.	Consumption is calculated to include the 1 st day of responsibility.	Compliant
F	ICPs end on the last day of the month.	Consumption is calculated to include the last day of responsibility.	Compliant
G	ICPs start part way through a month.	Consumption is calculated to include the 1 st day of responsibility.	Compliant
H	ICPs end part way through a month.	Consumption is calculated to include the last day of responsibility.	Compliant
I & J	ICP's are lost and won back in a month.	Consumption is calculated for each day of responsibility.	Has not occurred
N	ICPs start on 1 st and end on last day of month.	Consumption is calculated for each day of responsibility.	Has not occurred
O	Rollover reads	Consumption is calculated correctly in the instance of meter rollovers.	Compliant

5.6 Proportion of Historic Estimates (Rule 40.1)

This rule requires retailers to report to the allocation agent the proportion of historic estimates contained within the consumption information for the previous initial, interim and final allocations. The relevant files were examined and compliance is confirmed.

5.7 Billed vs Consumption Comparison (Rule 52)

The GAR080 return files were examined for the months September 2011 to November 2013. The content of the files was “proved” by selecting some gas gates and checking the bills in Kinetiq for all ICPs at that gate, against the total in the GAR080 files. This confirmed the accuracy of the data. The table below shows that OnGas’ consumption information that is submitted to the allocation agent is very close to the quantities billed. The GAS070 file sent in October 2013 (should be quantities billed in September) contained quantities billed in October. I checked several other months and the files contained the correct data.

A summary of the billed vs consumption information is contained in the table below.

Month	Billed	Consumption	% Difference
September 2011	8,088,227	8,075,700	-0.15%
October 2011	8,016,166	7,963,976	-0.65%
November 2011	7,963,236	7,944,948	-0.23%
December 2011	8,002,011	7,968,883	-0.4%
January 2012	8,048,906	8,004,971	-0.54%
February 2012	8,079,940	8,058,753	-0.47%
March 2012	8,756,642	8,765,803	0.26%
April 2012	8,081,113	7,996,647	-1.04%
May 2012	8,115,110	8,022,425	-1.14%
June 2012	8,227,143	8,126,691	-1.22%
July 2012	8,245,399	8,194,623	-0.62%
August 2012	7,990,161	7,972,548	-0.22%
September 2012	8,217,528	8,182,424	-0.43%

Month	Billed	Consumption	% Difference
October 2012	8,305,078	8,287,761	-0.21%
November 2012	8,324,888	8,329,006	0.05%
December 2012	8,326,370	8,297,818	-0.34%
January 2013	8,298,735	8,253,358	-0.55%
February 2013	8,298,282	8,238,222	-0.72%
March 2013	8,146,767	8,247,520	1.24%
April 2013	8,164,773	8,204,098	0.48%
May 2013	8,139,186	8,127,984	-0.14%
June 2013	8,096,234	8,045,222	-0.63%
July 2013	8,010,959	8,003,955	-0.09%
August 2013	8,023,525	8,009,687	-0.17%
September 2013	8,057,415	8,047,831	-0.12%
October 2013	8,024,867	8,071,404	0.58%
November 2013	8,033,185	8,062,781	0.37%

The table below shows a comparison between quantities billed and consumption information submitted to the allocation agent for a three year period. The consumption information is higher than quantities billed by 0.06%. This minor difference can be explained by the fact that the revision and normalisation processes for billed data are different to those for consumption data, the billed data, and the consumption data contains some initial and interim submission information for the most recent months, which will include a higher proportion of estimated data. Although these figures cannot be directly compared, they provide a useful indicator to ensure that under reporting of consumption information is not occurring.

Year ending	Billed	Consumption	Percentage Difference
November 2011	7,963,236	7,944,948	-0.23%
November 2012	8,324,888	8,329,006	0.05%
November 2013	8,033,185	8,062,781	0.37%
Total	24,321,309	24,336,735	0.06%

6. Recommendations

As a result of this performance audit the following recommendations are made in relation to OnGas:

1. I recommend a monthly validation of meter pressure and dials with all meter owners.
2. TOU data collection agents send monthly "text" files as email attachments. This method is not considered secure and I recommend that these files be zipped with password protection to ensure their security during transmission.
3. I recommend the temperature data is refreshed to ensure it is accurate and I recommend adjustment for the Joule Thompson effect.
4. I recommend that the meter reading hand-held validation settings are tightened to help identify potential meter reading errors.

Appendix 1 – Control Rating Definitions

Control Rating	Definition
Control environment is not adequate	<p>Operating controls designed to mitigate key risks are not applied, or are ineffective, or do not exist.</p> <p>Controls designed to ensure compliance are not applied, or are ineffective, or do not exist.</p> <p>Efficiency/effectiveness of many key processes requires improvement.</p>
Control environment is adequate	<p>Operating controls designed to mitigate key risks are not consistently applied, or are not fully effective.</p> <p>Controls designed to ensure compliance are not consistently applied, or are not fully effective.</p> <p>Efficiency/effectiveness of some key processes requires improvement.</p>
Control environment is effective	<p>Isolated exceptions identified when testing the effectiveness of operating controls to mitigate key risks.</p> <p>Isolated exceptions identified when testing the effectiveness of controls to ensure compliance.</p> <p>Isolated exceptions where efficiency/effectiveness of key processes could be enhanced.</p>

Appendix 2 – OnGas Response

26 May 2014



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Dear Steve

**OnGas Downstream Reconciliation Performance
– Draft Audit Report**

Thank you for providing On Gas Limited ("OnGas") with the opportunity to provide feedback on the audit commissioned by the Gas Industry Company ("GIC") on OnGas's compliance with the Gas (Downstream Reconciliation) Rules 2008.

OnGas generally supports the Draft Audit Report's recommendations.

We have the following comments regarding the issues you raised in your Draft Audit Report and our proposed actions to address them:

Issue	Comment	Action
Incorrect altitude figure for one ICP	We have addressed this one-off issue. Our usual monthly check did not incorporate the change to outsourcing our meter data processing in Flow2E.	We have put a check in place to validate our altitude data on a monthly basis in Flow2E against the Gas Registry.
Consumption information calculated using the incorrect gas type leading to over submission by 38GJ	We have addressed this one-off issue and have credited the customer. Our usual monthly check did not incorporate the change to outsourcing our meter data processing in Flow2E.	We have put a check in place to validate gas type on a monthly basis in Flow2E against the Gas Registry.
Initial submission accuracy did not meet the 10% requirement for some gas	Noted.	The breaches you identified have also been raised by the Market Administrator

Issue	Comment	Action
gates		<p>("MA"). We have responded to the MA through the processes established under the Gas Downstream Reconciliation Rules.</p> <p>We believe these issues do not have any material impact on other market participants.</p>
GAS070 file for October 2013 contained quantities for the incorrect month	We have submitted the correct quantities to the Allocation Agent.	We have put a check in place to stop the incorrect month being loaded.

We are happy for you to quote any of our comments in your Final Report.

If you have any questions, or require further information, please contact me at 04 803 9044 or a.carrick@vector.co.nz.

Kind regards



Anna Carrick
Manager – Natural Gas Trading