Gas Downstream Reconciliation Performance Audit Final Report

For

OnGas

Prepared by Steve Woods – Veritek Ltd

Date of Audit: 15/02/11 & 16/02/11

Date Audit Report Complete: 07/06/11

Executive Summary

This Performance Audit was conducted at the request of the Gas Industry Company (GIC) in accordance with Rule 65 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 and 80: the commissioning and carrying out of performance audits and event audits, V2.0" which was published by the GIC in October 2010.

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

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

- 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.
- The use of incorrect meter pressure information has led to the net over submission of consumption information to the allocation agent of approximately 1,111GJ for a thirteen month period.
- 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.
- OnGas's initial submission accuracy did not meet the required accuracy percentage for every gas gate for the period October 2008 to December 2009.
- Three of five historic estimate scenarios were not calculating or apportioning consumption information correctly. This matter is now resolved.

At the November 2009 Retailer's Forum the issue of "consistency of application of gas billing factors" was discussed. It was agreed that this forum would draft a guideline to assist with addressing this issue. Contact Energy produced a draft guideline and I recommend that this draft guideline be further developed into a "Guideline note" to assist participants with compliance with the rules, and to ensure the consistent application of the relevant factors.

The issue of incorrect data in relation to meter pressure has now been identified in a number of performance audit reports. I recommend that this matter be raised at an industry wide level, with the following objectives:

- Determine the extent of meter pressure inaccuracy, by conducting meter pressure field checks and comparing these results to meter dockets, meter owners' databases and retailers' databases. This recommendation was also made during the 2009 event audit for the Greater Auckland gas gate.
- Identify actions to improve the current accuracy of meter pressure data.
- Improve validation processes to ensure new meter pressure errors are not introduced.

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	Some time delays exist with the registry update systems and processes. 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.
Metering set up information	2.2	Adequate	Not compliant	Some pressure factor and meter dial discrepancies exist between OnGas's and meter owners' records.
Billing factors	2.3	Adequate	Compliant	It is recommended that OnGas refresh temperature data to ensure it is accurate.
Archiving of reading data	3.1	Effective	Compliant	It is recommended that meter reading files are zipped and password protected as a minimum to ensure its 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.
Non TOU error correction	3.5	Adequate	Not compliant	The error correction processes are robust, but are not applied in all cases.
TOU validation	3.6	Effective	Compliant	Event log and alarm log reporting, including time synchronisation, is reviewed after consumption information has been provided to the allocation agent. It is recommended that OnGas consider including these steps into their process prior to “day 4”.
Energy consumption calculation	4	Adequate	Compliant	The calculation is using one too many days to calculate the average of calorific values for the “read to read” period. This is considered a minor issue with a negligible effect on the accuracy of consumption information.
TOU estimation and correction	5.1	Effective	Not compliant	OnGas’s processes achieve compliance with the requirement to provide its “best estimate of consumption information”. The existence of any estimated TOU consumption information is considered a matter of non-compliance. This issue is addressed on a monthly basis and breach allegations are in existence in all cases.
Provision of retailer consumption information	5.2	Adequate	Compliant	The process for preparing consumption information files is compliant; however, some meter pressure and meter dial discrepancies exist between OnGas’s and meter owners’ records. This has resulted in incorrect consumption information being submitted to the allocation agent.

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 three-day window at the end of each month and on most occasions achieves 100% of meter readings during this period.
Historic estimates	5.5	Adequate	Not compliant	Compliance was not achieved for all of the scenarios provided during the audit.
Proportion of HE	5.6	Effective	Compliant	Reporting has been provided as required.
Billed vs consumption comparison	5.7	Effective	Compliant	OnGas's consumption information that is submitted to the allocation agent is higher than the billed information by 0.1% for the 12-month period ending October 2010. Although these figures cannot be directly compared, they provide a useful indicator to ensure that under reporting of consumption information is not occurring.

Persons Involved in This Audit

Auditor:

Steve Woods
Veritek Limited

OnGas personnel assisting in this audit were.

Name	Title
Jonathan Baker	Operational Analyst
Julie Vanner	Operational 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

Contents

1. Pre-Audit and Operational Infrastructure Information

1.1 Scope of Audit

This Performance Audit was conducted at the request of the GIC in accordance with Rule 65 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, -

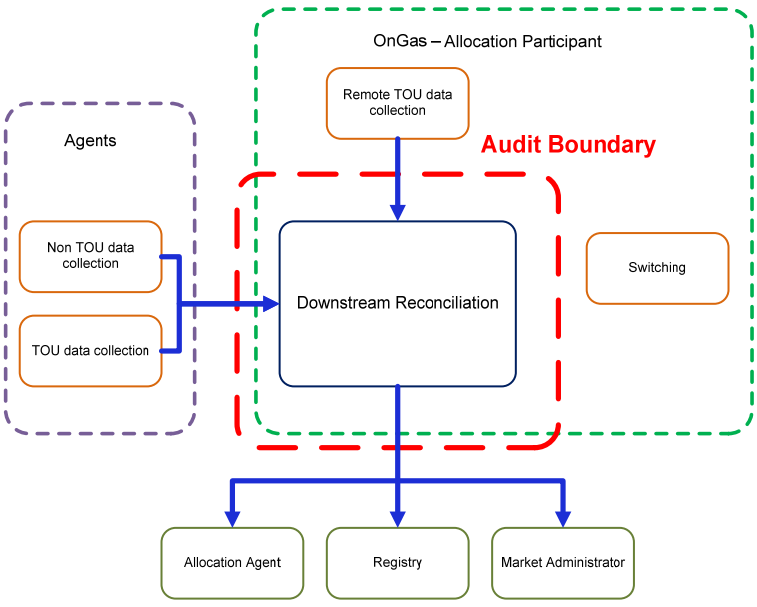
65.2.1 The performance of the allocation agent or that allocation participant in terms of compliance with these rules; and

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 the GIC, and in accordance with the "Guideline note for rules 65 to 75 and 80: the commissioning and carrying out of performance audits and event audits, V2.0" which was published by the GIC in October 2010.

The audit was carried out on February 15th and 16th 2011 at OnGas's offices in Wellington.

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.



1.2 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's 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)

1.3 General Compliance

This is OnGas's first performance audit under rule 65; therefore, there is not a previous audit report for review.

An event audit was conducted in 2009 for the Greater Auckland and Tawa A gas gates. The relevant finding of these audits, which has been further examined during this performance audit, is that five ICPs were identified with meter pressure discrepancies between OnGas data and meter owner data. This matter is discussed further in Section 2.2.

OnGas has 79 alleged breaches recorded by the Market Administrator since October 2008. They are summarised in the table below.

Nature of Breach	**Rule**	**Quantity**	**Section in this Report**
Switching Breaches		7	Not within audit scope
Submission of estimated TOU data	31.1, 32.1 & 33.1	60	5.1
Initial vs final allocation variances more than 15 %	37.2	10	5.3
Late submission	31	3	5.2
Incorrect volume conversion	28	1	2.2
Late trading notification	39.2.3	4	
Late "quantities billed" file	52	1	5.7

The market administrator considers five of the alleged breaches to be "material", one of these has been settled and four are still under investigation. I have assessed the likelihood of these five breach allegations recurring and comment is provided in Sections 3.6, 5.1 and 5.3.

As noted in the Summary of Report Findings, this audit has found five 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 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
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
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
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
Three of five historic estimate scenarios were not calculating or apportioning consumption information correctly. This matter is now resolved.	35	5.5

1.4 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 from metering equipment owners and was provided within the requested timeframe or a subsequent agreed timeframe by all parties. I consider that all parties have complied with the requirements of this rule.

1.5 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. The following parties responded.

Party	Response	Comments provided	Attached as appendix
OnGas	Yes	Yes	Yes
Powerco	Yes	Yes	Yes

The comments received were considered in accordance with rule 71.1, prior to preparing the final audit report. No changes have been made to the final report as a result of the comments received.

1.6 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 it is recommended that these files be zipped with password protection to ensure their security during transmission. .

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.

At the November 2009 Retailer's Forum the issue of "consistency of application of gas billing factors" was discussed. It was agreed that this forum would draft a guideline to assist with addressing this issue. Contact Energy produced a draft guideline and I recommend that this draft guideline be further developed into a "Guideline note" to assist participants with compliance with the rules, and to ensure the consistent application of the relevant factors.

Compliance with this rule has been examined in relation to the set-up of ICP, metering and billing information.

2.1 ICP Set Up Information

2.1.1 New Connections Process

The process was examined 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 seven new ICPs in the period June to December 2010. In all cases, the registry was updated with a change of status to ACTC more than five business days after the actual event date. For five ICPs the registry was updated more than twenty days after the actual event date. The late provision of meter dockets was the cause in all cases.

I recommend that OnGas obtain reporting from distributors of ICPs at "New" where they are the proposed retailer. They can then 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 conducts a full validation of their system against the registry on a monthly basis, and meter pressure is validated against meter owner data every six months to ensure the accuracy of this information.

2.1.2 Altitude Information

OnGas uses the altitude at each gas gate for all ICPs connected to that gate.

NZS 5259:2004 Amendment No1, which was published in November 2009, contains two changes, which affect the way that altitude information should be managed.

1. The maximum permissible error has been reduced from ± 1.5% to ± 1.0% where the meter pressure is below 100kPa and ±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 ± 1.0%. Altitude figures that are within approximately 45m of the actual altitude will ensure an accuracy of ± 0.5%.

OnGas has eleven ICPs with a meter pressure greater than 100kPa where the difference in altitude between the gate and the figure populated on the registry by the distributor is greater than that allowed in point 1 above. There are a further nine ICPs with meter pressures less than 100kPa where the requirement of point 1 has not been met.

I found that point 2 above had not been met for thirty ICPs checked. I recommend that OnGas uses the distributors' altitude figures and not those at the gas gates.

I compared the distributors' figures to "google earth" data and found that 28 of 30 were within a tolerance of ± 20m.

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

2.2 Metering Set-up Information

The event audits mentioned in Section 1.3 identified some meter pressure discrepancies. OnGas then conducted some further analysis for all gas gates and identified five ICPs where the meter pressure did not match that provided by the meter owner. These discrepancies resulted in the over reporting of consumption information to the allocation agent of approximately 1,167GJ for a thirteen month period.

I also compared the meter pressure recorded by OnGas against information provided by meter owners. This analysis showed two additional meter pressure discrepancies. These discrepancies have resulted in the under reporting of consumption information to the allocation agent of approximately 56GJ since these ICPs started with OnGas in August and September 2010. Customer billing was based on the same information, therefore there was no benefit to OnGas resulting from the

incorrect reporting of consumption information. Incorrect meter pressure for the seven ICPs has resulted in a net over submission of consumption information of 1,111GJ for a thirteen-month period.

The correction of meter pressure figures has occurred for all appropriate consumption periods for three ICPs, however for the remaining four, the meter pressure was corrected from October 1st 2010 and not from the month the error occurred. There has been an over submission of 86GJ for these ICPs that will not be adjusted by the revision process.

The discrepancies identified are shown in the table below.

Meter Owner	Total ICPs	Meter Pressure Discrepancies	Meter Dial Discrepancies	Multiplier Discrepancies
NGC	87	0	6	1
Powerco	33	3	12	0
Gas Net	2	1	0	0
Contact	99	3	10	1
Total Discrepancies		**7**	**28**	**2**

Meter dockets, or other records, were requested from meter owners to confirm the accuracy of their data for all of the discrepancies noted above. This analysis showed that the meter owner information was correct in all cases for meter pressure and meter dials.

For one ICP where GasNet is the meter owner, the meter pressure figure provided during OnGas's analysis was different to that confirmed during my investigations. The issue of incorrect data in relation to meter pressure has now been identified in a number of performance audit reports. I recommend that this matter be raised at an industry wide level, with the following objectives:

- Determine the extent of meter pressure inaccuracy, by conducting meter pressure field checks and comparing these results to meter dockets, meter owners' databases and retailers' databases. This recommendation was also made during the 2009 event audit for the Greater Auckland gas gate.
- Identify actions to improve the current accuracy of meter pressure data.
- Improve validation processes to ensure new meter pressure errors are not introduced.

There are two ICPs where OnGas records show a multiplier and the meter owner's records show a multiplier of 1. Site investigations confirm that OnGas's multipliers are 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. I also recommend that the GIC consider whether it is more appropriate for this information to be contained on the registry.

The use of incorrect meter pressure information has led to the submission of incorrect consumption information to the allocation agent. This is alleged as a breach of rules 26.2.1, 26.3 & 28.2.

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. The temperature data for gas gates HTV11301 and TAU07001 was compared to data recently provided by NIWA and the figures used by OnGas appear to be approximately 1.5ºc to 2.0ºc lower.

It is recommended that OnGas refresh this data to ensure it is accurate.

OnGas does not apply the Joule Thompson effect adjustment because network pressure information on the registry is not 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 0.5º 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. It is recommended that distributors be required to populate this information accurately on the registry for use by retailers.

2.3.2 Calorific Values

Gas composition data is sourced from the Open Access Transmission Information System (OATIS) and is loaded into Kinetiq. The accuracy of this information was checked by comparing an OATIS file with the contents of Kinetiq for January 2011. The information in Kinetiq was correct.

The process was also observed for the daily downloading of this data. Whilst this process includes some manual steps, the personnel involved appear to be following well defined steps. If the data is not loaded for a particular day then the invoicing process cannot run.

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 it was found that the readings matched the data in the billing sheets. This proves the end-to-end process. This data is transmitted as text files via email. I recommended that 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 2010, 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 2010.

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

OnGas achieved compliance with 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.

Readings are then subject to "billing validation". 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 process for meter pressure error correction was examined, along with two specific examples. The meter pressure for an ICP was changed from 21kPa to 70kPa in September 2010. I identified

this discrepancy as part of the audit. The meter docket was requested and received in February 2011. The correction process was as follows:

- The meter pressure was changed in Kinetiq from 21kPa to 70kPa with an effective date of 24/09/10
- The billing sheets were then re-uploaded into Kinetiq for each of the months using the same meter readings. This effectively "re-ran" the energy calculation using the new meter pressure.

A second similar example was also examined and the same process was followed.

Whilst this correction process has 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 the correction.

Four of the seven meter pressure discrepancies mentioned in section 2.2 have not been corrected for previous consumption periods. This is alleged as a breach of rules 26.2.1, 26.3 & 28.2 in section 2.2.

3.6 TOU Validation

TOU data is provided by OnGas's TOU data collection agents as emailed text file attachments. These files are then saved into a "received files" directory. Some data is collected using "Masterlink" software and some is downloaded manually. Event log and alarm log reporting, including time synchronisation, is reviewed after consumption information has been provided to the allocation agent. It is recommended that OnGas consider including these steps into their process prior to "day 4".

This data is then imported into an Access database where the format is standardised prior to uploading into Kinetiq, where a check is conducted for invalid dates and times. A missing data check is also conducted by checking the total number of hours in each file.

Validation then occurs in a spreadsheet based validation tool. The following checks are conducted:

- Temperature and pressure are checked to ensure they are within pre-defined limits.
- Volume is compared to pressure.
- Uncorrected values are corrected in the spreadsheet for pressure and temperature factors and the results compared to the corrected values.

Register reads are collected each month and a volume comparison is conducted in Kinetiq against the data in the TOU files. One of the "material" breach allegations related to an ICP where the data collected was half hour data rather than hourly data and only the second half hour for each hour was used. Validation against the register read would have identified this issue; however, the readings had not been collected for a number of months due to access issues. This matter is now resolved.

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)

To evaluate this calculation a spreadsheet was prepared which converts volume between meter readings to volume at standard conditions and then to energy consumption. The relevant information for an ICP was entered into the spreadsheet and the resulting energy value was compared to that calculated by Kinetiq. OnGas uses the AGA8 formula for super compressibility for all ICPs.

This comparison found that the Kinetiq calculation was using one too many days to calculate the average of calorific values for the "read to read" period. I have considered whether this matter constitutes non-compliance with NZS 5259:2004. Section 1.2.7 of NZS 5259:2004 states: "Where calorific value is determined for conversion purposes the accuracy of the measurement of the calorific value shall be ± 0.5%". The use of an additional day to calculate the average calorific value is unlikely to introduce errors in excess of ± 0.05%. This figure is considerably less than the allowable threshold of ± 0.5%. I have therefore concluded that OnGas has not breached rule 28.2. However, I recommend that the calculation is changed to include the correct number of days.

Apart from this minor issue, the remainder of the formula is calculating as expected.

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.

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.

Two examples were examined. In the first example, the data was missing and needed to be estimated based on previous periods. The second example was where a corrector had failed. The total volume was available from a register reading and this was apportioned into the appropriate periods based on information from the customer regarding their operating pattern during the period concerned.

In both 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.

OnGas's processes achieve compliance with the requirement to provide its "best estimate of consumption information".

The existence of any estimated TOU consumption information is considered a matter of non-compliance. This issue is addressed on a monthly basis and a number of breach allegations have been made as recorded in Section 1.3. One of the "material" rule breaches relates to an instance where a faulty meter was not replaced for several months due to process issues and on-site complications. The meter owner is aware of the impact on submission accuracy due to the problems at this ICP.

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 February 2011 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.

As noted in Section 2.2, the use of incorrect meter pressure information has led to the over reporting of consumption information to the allocation agent of at least 1,111GJ for a thirteen month period. A breach allegation is made in Section 2.2

5.3 Initial Submission Accuracy (Rule 37.2)

Final allocations are complete for the months October 2008 to December 2009. 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 15% up until September 2009 and 12.5% from October 2009.

OnGas met this requirement for a number of months during the 15 month period shown. The results are summarised in the table below.

Month	**% Error**	**Total Gas Gates**	**Number Within 15%**	**% Compliant**
October 2008	15%	31	30	96.8%
November 2008	15%	31	30	96.8%
December 2008	15%	31	31	100%
January 2009	15%	31	30	96.8%
February 2009	15%	31	31	100%
March 2009	15%	31	29	93.6%
April 2009	15%	31	31	100%
May 2009	15%	31	31	100%
June 2009	15%	31	30	96.8%
July 2009	15%	31	31	100%
August 2009	15%	31	30	96.8%
September 2009	15%	31	30	96.8%
October 2009	12.5%	33	32	97.0%
November 2009	12.5%	31	29	93.6%
December 2009	12.5%	30	30	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
October 2008	47,982	48,146	-0.3%
November 2008	39,212	37,750	3.9%
December 2008	32,638	33,111	-1.4%
January 2009	32,964	33,453	-1.5%
February 2009	33,118	33,843	-2.1%
March 2009	41,432	41,743	-0.7%
April 2009	45,287	45,152	0.3%
May 2009	62,539	62,106	0.7%
June 2009	64,175	64,654	-0.7%
July 2009	72,259	72,050	0.3%
August 2009	60,261	58,895	2.3%
September 2009	51,513	51,635	-0.2%
October 2009	97,941	98,373	-0.4%
November 2009	85,217	84,700	0.6%
December 2009	78,391	77,696	0.9%

The table above shows that the variation between initial and final submissions is very small in most cases. OnGas conducts meter reading during a three-day 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.

November 2008 has the largest variation and this was due to a “back dated” new connection. This matter is the subject of a breach allegation and is still under investigation. My recommendations in Section 2.1.1 will minimise the recurrence of this type of issue.

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.

Only five of the scenarios had occurred and compliance is confirmed for two scenarios. For scenarios E and G, the calculation was using the incorrect number of days, which meant that a small quantity of consumption was allocated to the following month. Scenario O was examined in relation to meter changes and not “rollover” reads. Two issues were discovered. Firstly, when a meter change had occurred during a month the entire month’s consumption was used to apportion volume between the current and previous month. The calculation should only have apportioned the volume up to the meter removal date. The second issue was that consumption up to a meter change date was submitted twice as the result of a manual error. The calculations have been automated for all scenarios and the issues remedied for future calculations. The total effect on consumption information submitted to the allocation agent is less than 5GJ for all ICPs concerned. The relevant revision files will reflect the correct information.

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.	Has not occurred
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 1st day of a month.	Consumption is calculated to include the 1st day of responsibility.	Not 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 1st day of responsibility.	Not 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 1st 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.	Not 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 October 2009 to August 2010. 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's consumption information that is submitted to the allocation agent is very close to the quantities billed, with the exception of March 2010. I believe this discrepancy relates to the timing of the production of the GAR080 return files in relation to the re-submission of a corrected interim GAS050 file by OnGas for the month of January 2010. This correction was made in May 2010 and although it was only to ensure the allocation of consumption information to the correct gates, the quantity of the error seems to match the difference between billed and consumption information for the March 2010 file.

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

Month	Billed	Consumption	% Difference
October 2009	8,498,905	8,502,441	0.0%
November 2009	8,623,771	8,633,006	0.1%
December 2009	8,755,699	8,767,612	0.14%
January 2010	8,802,460	8,816,699	0.2%
February 2010	8,765,805	8,775,568	0.1%
March 2010	8,770,183	8,148,007	-7.1%
April 2010	8,756,642	8,765,803	0.1%
May 2010	8,673,183	8,683,967	0.1%
June 2010	8,584,738	8,596,626	0.1%
July 2010	8,507,027	8,521,127	0.2%
August 2010	8,486,518	8,491,767	0.1%
September 2010	8,448,565	8,449,847	0.0%
October 2010	8,322,549	8,327,451	0.1%

6. Recommendations

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

- 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.
- I recommend that OnGas obtain reporting from distributors of ICPs at "New" where they are the proposed retailer. They can then 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.
- 28 meter dial discrepancies were found between OnGas's and meter owners' records. I recommend that validation occurs on a monthly basis with meter owners to address this matter.
- OnGas uses temperature data that was supplied by NIWA in approximately 1994. This data seems to be different to more recent data. I recommend that OnGas refreshes this data and records its source and the date it was loaded into Kinetiq.
- I recommend that the meter reading hand-held validation settings are tightened to help identify potential meter reading errors.
- Event log and alarm log reporting, including time synchronisation, is reviewed after consumption information has been provided to the allocation agent. It is recommended that OnGas consider including these steps into their process prior to "day 4".
- The formula to convert volume between meter readings to volume at standard conditions and then to energy is using one too many days to calculate the average of calorific values for the "read to read" period. I recommend that the calculation be changed to include the correct number of days.

A general recommendation is made in relation to billing factors. At the November 2009 Retailer's Forum the issue of "consistency of application of gas billing factors" was discussed. It was agreed that this forum would draft a guideline to assist with addressing this issue. Contact Energy produced a draft guideline and I recommend that this draft guideline be further developed into a "Guideline note" to assist participants with compliance with the rules, and to ensure the consistent application of the relevant factors.

The issue of incorrect meter owner data in relation to meter pressure has now been identified in a number of performance audit reports. I recommend that this matter be raised at an industry wide level, with the following objectives:

- Determine the extent of meter pressure inaccuracy, by conducting meter pressure field checks and comparing these results to meter dockets, meter owner's databases and retailer's databases. This recommendation was also made during the 2009 event audit for the Greater Auckland gas gate.

- Identify actions to improve the current accuracy of meter pressure data.
- Improve validation processes to ensure new meter pressure errors are not introduced.

Two additional recommendations are made in relation to meter information:

- That meter owners be required to undergo performance audits to ensure the processes for recording and reporting metering set-up information are robust.
- That the switching rules be amended to include meter pressure, meter dials and multiplier as registry fields that are maintained by meter owners.

Appendix 1 – Control Rating Definitions

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

Appendix 2 – OnGas Comments

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12 May 2011

Steve Woods
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By email: steve.woods@veritek.co.nz

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 fully supports the Draft Audit Report's recommendations, particularly the development of industry guidelines to ensure the consistent application of gas billing factors by market participants.

We support the Draft Report's recommendation that billing factors should be recorded in the Gas Registry. To further address the billing factor issue, we propose that meter owners be obliged under the Gas (Switching Arrangements) Rules 2008 to supply the Gas Registry with information on billing factors.

OnGas is working through the Draft Report's individual recommendations to ensure that the appropriate actions are taken and systems put in place. We are in the process of comprehensively reviewing all billing factors associated with ICPs, including temperature, altitude, pressure and dials.

In addition, Ongas has set up a process to ensure that every time a site is switched, or a new site is connected, we verify with the meter owner that we have the correct pressure. We also check with the meter owner every six months that our pressure information is accurate.

We are happy for you to quote any of our comments in the 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
Gas Portfolio Manager

Appendix 3 – Powerco Comments

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12 May 2011

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[Sent by email to: steve.woods@xtra.co.nz]

POWERCO

Dear Steve,

OnGas Draft Performance Audit Report 2011

1. Thank you for the opportunity to comment on the '*OnGas Draft Performance Audit Report 2011*'.

2. We are keen to gain a better understanding of the practical issues identified in the report so we can investigate them in more detail. In particular we would wish to discuss the methodology used and materiality of any errors before identifying how best to make any changes required.

3. We support the recommendation that issues pertaining to meter pressure discrepancies be reviewed at an industry wide level, and that the extent and cause of inaccuracies be established along with their impact before a course of action is agreed.

4. Powerco looks forward to working with the Gas Industry Company to better understand the issues raised in this audit. We take our responsibilities as a prudent network operator very seriously and as a result seek to understand and resolve issues as we become aware of them.

Yours sincerely,

Charlotte Littlewood

Charlotte Littlewood
Regulatory Manager
Powerco