RECONCILIATION AUDIT ON GAS LTD

Date of audit: 12 to 16 June 2017

Report completed: 22 August 2017

Under the Gas (Downstream Reconciliation) Rules 2008 the Gas Industry Company commissioned Langford Consulting to undertake a performance audit of On Gas Ltd. The purpose of the audit is to assess compliance with the rules and the systems and processes put in place to enable compliance.

Auditor Julie Langford

Executive Summary

This performance audit was conducted at the request of the Gas Industry Company (GIC) in accordance with rule 65 of the 2015 Amendment Version of the Gas (Downstream Reconciliation) Rules 2008 effective from September 2015.

The purpose of this audit is to assess the systems, processes and performance of On Gas Ltd (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, V3.0" which was published by the GIC in June 2013.

The summary of report findings in the table below shows that the OnGas control environment is "effective" for ten of the areas evaluated, "adequate" for three areas and "not adequate" for five areas.

Ten of the eighteen areas evaluated were found to be compliant. Breaches have already been raised by the Allocation Agent with respect to the accuracy of initial submission files (rule 37.2); the accuracy and completeness of information (r26.2.1) and the provision of billed energy quantities on time (r 52.2.1). The following additional alleged breaches are raised because of this audit:

Breach Allegation	**Rules**	**Section in this report**
OnGas was the responsible retailer for four newly connected ICPs, but did not include them in their initial submission files because they had not yet signed a contract or sent a bill.	28.3	2.1.1
OnGas accuracy level falls outside the standard required by NZS5259 when converting volume to energy because of inaccurate temperature factors that have not been recently reviewed	28.2	2.3.1
Inaccurate GAS080 submitted regarding metering interrogation	26.2.1	3.3
Corrections for revised meter pressures were not back dated for the full 12 months	26.2.1	3.5
Incorrect initial submission files for 22 ICPs were submitted due to issues between Flow2E and Gentrack.	26.2.1	5.2
Incorrect submission files (including final files) were submitted for 7 ICPs due to issues between Flow2E and Gentrack. The final submission data was understated by 628 GJs	26.2.1	5.2
Incorrect 'as billed' files were submitted for 11 ICPs due to issues	26.2.1	5.7

between Flow2E and the new Gentrack billing system.		
Incorrect 'as billed' files were submitted for 5 ICPs as corrections for incorrect meter pressures didn't flow through.	26.2.1	5.7
No 'as billed' files were submitted for June 2015 across all gas gates.	52.2.1	5.7
No trading notification could be found for a supplementary agreement. Therefore, it was not possible to confirm that it had been sent within the required timeframe or otherwise complied with the requirements. (r 39)	39	5.8

In addition to recommending that OnGas address the cause of the alleged breaches, the report also makes the following recommendation:

- That OnGas establish the detail of how Gentrack calculates forward estimates, confirm they are happy with the approach and document this as a part of their process documentation.

Summary of Report Findings

Issue	Section	Control Rating (Refer to Appendix 1 for definitions)	Compliance Rating	Comments
ICP set up information	2.1	Not adequate	Not compliant	OnGas was the responsible retailer for four newly connected ICPs, but did not include them in their initial submission files because they had not yet signed a contract.
Metering set up information	2.2	Effective	Compliant	Alignment between the registry and OnGas systems was found to be good, but it is recommended in the associated switching audit report that processes for routinely reviewing system data against registry data be reinstated to ensure this accuracy is maintained.
Billing factors	2.3	Not adequate	Not compliant	Inaccurate temperature factors that have not been recently reviewed are introducing error into the energy conversion process.
Archiving of reading data	3.1	Effective	Compliant	Meter reading data is readily available after 30 months.
Meter interrogation requirements	3.2	Effective	Compliant	Validation occurs to ensure allocation groups are correct.
Meter reading targets	3.3	Adequate	Not Compliant	There were some minor but systematic inaccuracies in GAS080s.
Non TOU validation	3.4	Effective	Compliant	Validation processes are robust.
Non TOU error correction	3.5	Adequate	Not Compliant	Corrections for revised meter pressures were not backdated for the full 12 months.

TOU validation	3.6	Effective	Compliant	Validation processes were reviewed and found to be robust.
Energy consumption calculation	4	Effective	Compliant	Processes were reviewed and found to be accurate.
TOU estimation and correction	5.1	Effective	Compliant	Examples were reviewed and no issues arose.
Provision of retailer consumption information	5.2	Not adequate	Not compliant	Incorrect initial submission files for 22 ICPs were submitted due to issues between Flow2E and Gentrack. Incorrect submission files (including final submission files) were submitted for 7 ICPs due to issues between Flow2E and Gentrack. The final submission data was understated by 628 GJs.
Initial submission accuracy	5.3	Not adequate	Not compliant	Alleged breaches have been made for initial allocations not being within 10% of the final allocation figures. Three issues were found to have contributed to these differences: • Issues with forward estimates in one month • Interaction issues between Flow2E and Gentrack which have now been resolved • Slow inclusion of new connections in submission files.
Historic estimates	5.4	Effective	Compliant	Compliance was achieved for all relevant scenarios
Proportion of HE	5.5	Effective	Compliant	The correct proportion of HE is being reported.

Forward Estimates	5.6	Effective	Compliant	Processes were reviewed and no issues were identified.
Billed vs consumption comparison	5.7	Not adequate	Not Compliant	Incorrect 'as billed' files arose because of two separate system issues; issues between the Flow2E and Gentrack billing systems and corrections for meter pressures not flowing through. Also, there was a failure to submit GAS070s for all gates for one month.
Gas trading notifications	5.8	Adequate	Not Compliant	No trading notification could be found for a supplementary agreement. Therefore, it was not possible to confirm compliance.

Contents

1. Pre-Audit and Operational Infrastructure Information

1.1 Scope of Audit

This performance audit was conducted at the request of the Gas Industry Company (GIC) in accordance with rule 65 of the 2015 Amendment Version of the Gas (Downstream Reconciliation) Rules 2008 effective from September 2015.

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, V3.0" which was published by the GIC in June 2013.

The audit was carried out on 12 to 16 June 2017 at OnGas' offices in Wellington.

The scope of the audit includes "downstream reconciliation" only. Switching and registry management functions were audited in conjunction with this audit but are included in a separate report.

The audit included an on-site visit to the OnGas offices in Wellington, as well as a visit to the Vector Data Services team in New Plymouth where the Flow2E system and its associated processes are managed.

1.2 General Compliance

1.2.1 Summary of Previous Audit

OnGas was last audited in March 2014 by Veritek Ltd. This audit found eight areas of non-compliance. Those breach allegations are detailed in the table below.

OnGas were asked what had been done in response to the findings from the last audit and their responses are also recorded below.

Breach Allegation	Rule	Section in this report	Resolution
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	*We used to maintain a spreadsheet to check registry data against what is in our billing system (Kinetiq) and what is in F2E (GJ calculating system).* *This check was being done on monthly basis* *But since we have moved to the new Billing system (Gentrack) we haven't been doing this check regularly because we haven't yet modified the old spreadsheet which did the checks to comply with the new system. The changes would mean writing SQL queries to pull out information from Gentrack and then do the comparison.* *We can commit to writing the required SQL queries which could pull out the information from the new system next month and could restart doing the checks again.*
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	2.3.2	*This same spreadsheet also used to check Gas Type. i.e OATIS againstF2E (GJ calculating system).* *As mentioned above we used to maintain this spreadsheet and do the checks monthly but since we have moved to the new Billing system (Gentrack) we haven't been doing this check regularly.* *We can commit to writing the required SQL queries which could pull out the information from the new system next month and could restart doing the checks again*
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	*We maintain Gentrack an allocation check spreadsheet where we run manual checks on the data which gets generated by Gentrack.*

The GAS070 file sent in October 2013 contained quantities for the incorrect month. All other months were correct.	52.2.1	5.7	*Since we use the billing (Gentrack) system itself to create and submit the allocation report such as GAS070 there is now less possibility of having a discrepancy and moreover we do double check the Gentrack generated GAS070 file against AS BILLED volume separately in a spreadsheet.*

Since the last performance audit OnGas has replaced its Kinetiq billing system with the Gentrack system which was considered a "major change". This was subject to an additional audit, under rule 65.5 of the 2015 Amendment Version of the Gas (Downstream Reconciliation) Rules 2008, limited in scope to an audit of the impact of the proposed change on the allocation agent or allocation participant's systems.

This audit confirmed the design of the Gentrack system as compliant with the rules. However, there were some process related matters noted that could only be tested post go live, during the next performance audit. Manual workarounds with a peer review and an audit trail were established until a permanent solution was developed.

The matters noted were:

1. *The GAS050 file includes six "non-allocated" ICPs which are not required to be in the file*
2. *The GAS040 file includes consumption for one CNG meter (downstream of the main meter) and one ICP where the customer has finalised.*
3. *The GAS040 excludes one ICP that should be included.*

These matters have been followed up as a part of this audit (see section 5.2)

1.2.2 Breach Allegations

OnGas had 34 alleged breaches recorded by the Market Administrator in the period June 2014 to May 2017, representing 95 underlying breaches. Four were alleged by Veritek, the remaining by EMS. They are summarised as follows:

Nature of Breach	Rule	Quantity	Section in this Report
Initial vs final allocation variances more than the allowable threshold	37.2	26	5.3
Required information to be accurate and complete	26.2.1	6	5.2
Deadline for provision of billed energy quantities	52.2.1	2	5.2

The following additional alleged breaches are raised because of this audit:

Breach Allegation	Rules	Section in this report
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OnGas accuracy level falls outside the standard required by NZS5259 when converting volume to energy because of inaccurate temperature factors that have not been recently reviewed	28.2	2.3.1
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1.3 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.

We consider that all parties have complied with the requirements of this rule.

1.4 Transmission Methodology and Audit Trails (rule 28.4.1)

A complete audit trail was viewed for all data gathering, validation and processing functions. Compliance is confirmed with this rule.

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 5259:2015, 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. The "Gas (Downstream Reconciliation) Rules 2008 Billing factors guideline note, V2.0" (Billing Factors Guideline) published by GIC on 30/11/15 was also considered when examining the set up and maintenance of 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.

The switching and registry management audit that was completed alongside this audit, reports on the analysis of the new connections process with respect to the Gas (Switching Arrangements) Rules 2008 (the switching rules) and this is therefore not repeated here in full.

OnGas had only 7 new connections from 1 January 2016 onwards and all were reviewed for correct inclusion in the submission files. It was noted that there was often a long gap between ICPs being active with meters installed and the related contract being signed, leading to a delay between when the first gas may flow and the date the first bill is sent out, which in turn resulted in quantities not being submitted in the initial submission file. There were four examples of quantities not being included in the initial file.

> ALLEGED BREACH: OnGas was the responsible retailer for the following four newly connected ICPs, but did not include them in their initial submission files because they had not yet signed a contract or sent a bill. (r28.3)
>
> 1001286366QTBA4
>
> 1001286561QT068
>
> 1001286563QT0ED
>
> 1001299872QT28C

2.1.2 Altitude Information

It is a distributor responsibility to populate the registry with correct altitude information to support compliance with NZS 5259:2015, and it is a retailer responsibility to comply with NZS 5259:2015 for the conversion of volume to energy.

NZS 5259 contains the following points, which affect the way altitude information should be managed:

1. The maximum permissible error is ± 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."
3. The altitude factor can be assumed to be 1 where meters are situated at an elevation less than 50m above sea level.

OnGas provided a registry list file which was reviewed for obvious outliers. A random sample of ICPs was also checked against "google earth" data. 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". Altitude figures that are within approximately 90m of the actual altitude will ensure an accuracy of ± 1.0%. Point 2 above recommends altitude figures are determined to within 10m where practicable. An evaluation of altitude data on the registry was conducted to check whether this recommendation had been met. As noted above, the margin of error of the "google earth" data appears to be approximately ± 10m, therefore, to allow for this margin, the registry data was checked to within 20m of "google earth" data.

The altitude data on the registry appears to be very accurate. Only two ICPs were found to have incorrect altitudes by +/- 20m. Both had a status of DECR (decommissioned) since 2015 and had been inactive prior to this, so no breach has been alleged.

A further evaluation was conducted of ICPs where the altitude figure was zero or blank in the registry. Two were found but the actual was less than 50m for both so an entry of 0m is still compliant with NZS5259 and no alleged breach has been made.

2.2 Metering Set-up Information

The records in the OnGas systems were compared against the information in the registry for gas gate; meter pressure; dials and multiplier. No discrepancies were found, but note the recommendation made in the accompanying switching audit for a reconciliation check to be re-established between OnGas systems and the registry.

2.3 Billing Factors

2.3.1 Temperature Information

For ICPs where the actual temperature is not measured NZS 5259:2015 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 uses option (c) for its process and uses a temperature data table that was provided to the auditor. This table provides a monthly temperature for each gas gate. A sample of data points was reviewed against data available from NIWA in the tables below.

Month	NIWA area	NIWA average	NIWA factor	gas gate	GNGC Tem	GNGC factor	Diffce %
Aug-16	Te Puke 30cm	10.22	1.016868405	Mt Maunganui	9.4	1.01982	-0.29516
Aug-16	Hamilton Ruakura 20cm	9.61	1.019062102	Hamilton	9.1	1.02093	-0.18679
Aug-16	Auckland Motat 20cm	11.46	1.012438073	Westfield	11.5	1.012296	0.014207
Aug-16	Whangerei 20cm	12.45	1.008928571	Whangarei	10.9	1.014434	-0.55054
Aug-16	Rotorua 20cm	8.9	1.021627371	Rotorua	7.9	1.025262	-0.36346
Aug-16	Gisborne 10cm	10.67	1.015256148	Gisborne	9.9	1.018018	-0.27619
Aug-16	Wellington 20cm	8.95	1.021446296	Waitangirua	8.8	1.02199	-0.05437
Aug-16	Upper Hutt 20cm	8.34	1.02365981	Tawa A	8.8	1.02199	0.166981
Aug-16	Paraparaumu	9.19	1.020578026	Paraparaumu	9.3	1.020181	0.039703
Feb-16	Te Puke 30cm	23.04	0.972855262	Mt Maunganui	18.1	0.989356	-1.65007
Feb-16	Hamilton Ruakura 20cm	22.7	0.973973297	Hamilton	17.8	0.990376	-1.64027
Feb-16	Auckland Motat 20cm	23.92	0.969973407	Westfield	18.7	0.987322	-1.73486
Feb-16	Whangerei 20cm	25.39	0.965197293	Whangarei	18.7	0.987322	-2.21247
Feb-16	Rotorua 20cm	20.08	0.982675715	Rotorua	16.6	0.994478	-1.18023
Feb-16	Gisborne 10cm	23.16	0.972461274	Gisborne	18.5	0.987999	-1.55377
Feb-16	Wellington 20cm	20.28	0.98200593	Waitangirua	18.8	0.986984	-0.49781
Feb-16	Upper Hutt 20cm	22.68	0.974039144	Tawa A	18.8	0.986984	-1.29449
Feb-16	Paraparaumu	21.7	0.977276581	Paraparaumu	17.1	0.992765	-1.54884

It is acknowledged that the NIWA data that OnGas' temperature data was compared against is not an average over several years, but for a specific month. However, it helps demonstrate how much variance in the factor to be applied in the energy conversion that can come about depending on the source data used.

The difference between the temperature values being used by OnGas for February were significantly lower than the NIWA values leading to a factor difference of greater than one percent for all the gates reviewed except for Waitangirua.

The OnGas audit in 2014 noted that:

> *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 1.5ºc to 2.0ºc 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:

- *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 acknowledge that their temperature data is the same as was being used at the time of the last audit and so dates back to 1994. Therefore, this audit concludes that the guidelines are not being followed as the temperature data has not being refreshed in the last 5 years, it appears likely that the data is significantly lower in February than might be expected and the error is such that it will be affecting the accuracy of the energy data. It is recommended that OnGas revise their temperature data to improve energy conversion accuracy.

- ALLEGED BREACH OnGas has failed to comply with NZS5259 when converting volume to energy because of inaccurate temperature factors (rule 28.2)

OBSERVATION: It is noted that OnGas had not conducted their own review of temperature data as they had been waiting for an industry wide solution to the temperature data issue to be provided.

2.3.2 Calorific Values

Gas composition data is sourced from the Open Access Transmission Information System (OATIS) and loaded into the Flow2E system by the Data Services team in New Plymouth. The process for uploading this data was observed during the New Plymouth on-site visit. Also, a sample check of the gas gate used for particular ICPs was done and the specific Calorific Value, CO2, N2, and SG used for energy conversion was conducted. No issues arose.

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 meter reads are available 30 months after their date of origi

Sample meter read data was also verified against the data used as the meter read input for the energy calculation to prove the prove the end-to-end process.

3.2 Metering Interrogation Requirements (rule 29)

Rule 29 specifies the type of metering (TOU or non-TOU) that must be installed at a consumer installation, the relevant allocation group that the consumer installation falls within and the interrogation requirements that apply depending on the type of metering and allocation group.

OnGas extract data from Gentrack using a SQL query and then use this data to double check allocation reports prior to submission. This same data is also used to validate that ICPs are in the appropriate allocation group. If it appears an ICP may need to be moved it is monitored for 3 months before making the change, to prevent constant changing to and from groups in response to only one month's data.

If a change is decided on the change is made in Gentrack which in turn creates a file to send to the registry. If there is a need to change the metering to TOU this involves a discussion with the account manager, physical change to metering on site, a change of instruction to Wells and a change to the billing of the customer. No issues were found with this process.

Changing an allocation group to group 4 has no impact as OnGas read all their customers monthly.

OnGas doesn't currently do a check of allocation group against load shedding group to identify any anomalies.

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 (rule 29.4.3).

OnGas has a policy of reading all ICPs once a month. Prior to the audit they reported to the auditor that they had no examples of any ICPs that hadn't been read in over 12 months or in over 4 months.

However, there have been some problems with the GAS080 files submitted regarding meter reading since the change to Gentrack. These are known but have not yet been fixed due to the prioritisation of other issues and because the reports are close to being accurate. The problems include the incorrect number of non-TOU meters installed (for example reporting 219 non TOU meters instead of 208 in February 2017); and the reporting of a percentage other than 100%, which would have been the accurate percentage (for example in February 2017 the rolling 4 month reading percentage reported was 99.54% instead of 100%).

ALLEGED BREACH Inaccurate GAS080 submitted under r40.2 (r26.2.1)

3.4 Non TOU Validation

OnGas load the meter reading files from Wells into a spreadsheet and these undergo the first stage of volume validation before being sent to Flow2E to be converted into energy. The spreadsheet also does BVI checks.

The Flow2E system produces worklists for the Data Services team to review. The team do validations using ranges which are site specific. When the file containing energy values are returned to OnGas they also send a file reporting on the validation checks.

The energy data returned by Flow2E is uploaded into the spreadsheet where a third stage of validation occurs on the energy values, pressure and CV. Data is graphed for every ICP. This data is then sent on to Gentrack where a fourth stage of validation occurs on both the energy values and the billing dollars arising. The tolerances for validation are reviewed every month and reset, depending on season.

Queries are raised with account managers if the data is unusual.

The sorts of issues that might be picked up are clocked meters, meter change and meter pressure change.

If it is identified there is no meter read, an estimate is done based on previous consumption and the analysts' experience. If meter reads are missed for two months the matter is escalated to the account manager.

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 (r44.2).

Error correction was examined by a "walk through" of the process and by examining examples where meters had stopped recording and examples where the meter pressure was corrected.

OnGas needed to do corrections for 5 incorrect meter pressures arising from the wider industry exercise to improve the quality of meter pressure information. These corrections were done in April

2016 and required the corrections to be backdated for the 12 months prior. However, OnGas had issues doing this as they had started using Gentrack as their new billing system from October 2015 onwards. They therefore only backdated the corrections as far as possible using Gentrack.

> ALLEGED BREACH: Corrections for revised meter pressures were not back dated for the full 12 months for the following ICPs (r26.2.1):
>
> 0001446589QT15E
> 1001283684QT3BE
> 0004226800NGEE6
> 1000521165PG6E7
> 0000361941QT6B6

An associated issue arose as these corrections were also not picked up in the 'as billed' files. This is detailed in section 5.7.

It was confirmed that the corrected quantities were included in the final submission files.

3.6 TOU Validation

The Data Services team in New Plymouth were visited as a part of this audit. This team do validations using ranges which are site specific for temperature, pressure and volume. The Flow2E system produces worklists for the team to review. When the file containing energy values are sent to OnGas they also send a file reporting on the validation checks.

On receipt by the OnGas Wellington team the data is validated by viewing graphs. Relevant information that informs the process includes last year's consumption, hourly consumption and discussions with account managers. The validated data is uploaded into Gentrack where additional validations occur.

No issues were identified during the review of TOU validation.

4. Energy Consumption Calculation (rule 28.2)

The OnGas data is converted to energy in the Flow2E system managed by the Data Services team in New Plymouth.

During the visit one TOU and one non-TOU ICP was selected and the calculation of the conversion factors was replicated to within the degree of accuracy required by NZS5259. Also, each item used in the calculation (e.g. calorific value, altitude etc) was traced back to source.

It was noted however that the process was not compensating for the Joule Thomson effect for sites with significant pressure changes, although this wasn't taking the calculation outside of the required degree of accuracy.

No other issues arose from either of these replications.

5. Estimation and Submission Information

5.1 TOU Estimation and Correction (rule 30.3)

OnGas provided five examples of TOU data that had required estimation/correction including a corroded corrector, faulty meters and a delay in setting up a meter due to health and safety issues.

No issues arose from the review of these estimations/corrections.

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

A GAS040 file for a recent month was examined and compared to the data in Gentrack and the OnGas spreadsheet. It was verified that the three sets of data were the same. The aggregate figures were also confirmed as being the correct summation of the individual values at an ICP level. This demonstrates that consumption information provided to the Allocation Agent is calculated at ICP level and then aggregated.

OnGas were asked whether INACT ICPs were still included in their submission files in case there was some gas recorded. OnGas reported that they had no inactive sites with consumption. OnGas explained their practice was not to mark sites as INACT in the registry until after the meter had been removed. OnGas continued to bill and read the meter of sites that are otherwise inactive, if the site still has a meter. This meant there was no risk of INACT sites with consumption occurring. The auditor reviewed the registry data to validate this and only one OnGas ICP was found to be recorded as INACT with a meter still on site, so it was unlikely any consumption had been missed by excluding INACT files from their submission files.

An issue affecting accuracy of submission files and 'as billed' files was a problem between Flow2E and Gentrack when Gentrack was first introduced. Flow2E produces revised energy files every time a relevant input is changed (e.g. gas type). This wasn't fully understood during the introduction of the new Gentrack system and led to some errors in submission data and 'as billed' files because of the way Flow2E and Gentrack were interacting. Now the system is better understood, processes have been put in place to manage the interaction between the two systems such that these errors shouldn't occur.

This Flow2E/Gentrack interaction issue resulted in three types of outcomes: one group of ICPs where initial submission files were inaccurate; one group of ICPs where the 'as billed' figures were wrong; and one group of ICPs where the submission files (including the final submission files) and the 'as billed' files were incorrect. The potential breaches for the incorrect submission files are listed here, the effect on initial v final is referred to in section 5.3 and the potential breaches for incorrect 'as billed' files are detailed in section 5.7. The affected months were October 2015 to February 2016.

> ALLEGED BREACH: Incorrect initial submission files were submitted for the following ICPs between October 2015 and February 2016 (r26.2.1):
>
> 1001268120NG1F2
> 1000505844PG1B3

1001274530QT2F9
0001632111QT44D
0004420007PGBFE
0002382315QT751
0009000960NGD43
0000031778GNA6A
0001017812NG8C8
0000012328GN54E
0003063196NG4CA
0009000693NGE9B
0009000803NG777
0009000960NGD43
0009001143NGD7B
0003067547NGF4C
0080012008PG14F
0008000231NGCB9
0080012008PG14F
1001264228NGB65
0001001766NGEB1
0001001766NGEB1

ALLEGED BREACH: Incorrect submission files (including final submission files) were submitted for the following ICPs between October 2015 and February 2016. The final submission data was understated by 628 GJs in total across these ICPs (r26.2.1).

0000516901QTBAD
1000521552PG0D4
0009001239NG9B4
1000521552PG0D4
0078000094PG227
0008000158NGE1B
0001833681QTF1E

The major change audit reported the following items, which were reviewed with OnGas as a part of this audit.

1. *The GAS050 file includes six "non-allocated" ICPs which are not required to be in the file*

Direct connects are now identified using the distributor code of VCTX and are excluded from the Gas050.

2. *The GAS040 file includes consumption for one CNG meter (downstream of the main meter) and one ICP where the customer has finalised.*

This ICP has had the allocation group of zero added to its record so that it is excluded from the GAS040.

3. *The GAS040 excludes one ICP that should be included.*

This was a one-off issue in Gentrack which has been resolved with a data fix.

5.3 Initial Submission Accuracy (rule 37.2)

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 for the months analysed is 10%.

OnGas did not meet this requirement for some gas gates during the 12-month period reviewed. The results are summarised in the table below. In total over this period there were 10 instances of a gate exceeding the +/-10% test and exceeding the 200GJ materiality threshold.

Month	Total Gas Gates	Number Within +/- 10%	% Compliant	Within +/- 10% or < 200 GJ	% Compliant or immaterial
January 2015	28	24	86%	28	100%
February 2015	28	24	86%	28	100%
March 2015	28	22	79%	28	100%
April 2015	28	25	89%	28	100%
May 2015	28	24	86%	27	96%
June 2015	28	22	79%	27	96%
July 2015	30	26	87%	30	100%
August 2015	30	25	83%	29	97%
September 2015	30	28	93%	29	97%
October 2015	30	24	80%	28	93%
November 2015	30	21	70%	29	97%
December 2015	30	22	73%	27	90%

The following table shows the difference between consumption information for initial and final submissions at an aggregated level for all gas gates. This demonstrates compliance in all 12 months.

Month	Initial Submission All Gas Gates (GJ)	Final Submission All Gas Gates (GJ)	Percentage Variation
January 2015	21,580	21,519	0.3%
February 2015	21,987	22,832	-3.7%
March 2015	26,544	26,575	-0.1%
April 2015	30,012	30,645	-2.1%
May 2015	39,325	41,740	-5.8%
June 2015	47,233	49,642	-4.9%
July 2015	57,194	56,189	1.8%
August 2015	58,496	58,500	0.0%
September 2015	44,993	47,197	-4.7%
October 2015	39,624	39,311	0.8%
November 2015	34,496	34,146	1.0%
December 2015	29,914	28,024	6.7%

Analysis at an ICP level of initial versus final differences at the worst gate/month showed that in December 2015 forward estimates had been done on a straight-line basis for buildings that would have been empty over the holiday period. Also, a spreadsheet formula went wrong calculating the wrong number of days. This was picked up and fixed in the spreadsheet after the December 2015 initials but in any case, this spreadsheet is no longer being used for forward estimates. Initial submission figures are now produced by Gentrack from January 2017 so this forward estimate issue has now been resolved.

Another issue affecting initial submission accuracy was the problem between Flow2E and Gentrack when it was first introduced described in section 5.2 which resulted in some errors in initial submission files. The accuracy of initial files was also affected by the failure to include some new connections, as explained in section 2.1.1.

Breaches have already been alleged for differences between initial and final submission data so are not repeated here.

5.4 Historic Estimates (Rules 34 & 35)

To assist with determining compliance of the historic estimate processes, OnGas was supplied with a list of scenarios. OnGas provided an example for each relevant scenario and all examples were found to meet the test expectation.

HE Scenarios			
Test	**Scenario**	**Test Expectation**	**Result**
A	ICP becomes Active part way through a month	Consumption is only calculated for the Active portion of the month.	No examples
B	ICP becomes Inactive part way through a month.	Consumption is only calculated for the Active portion of the month.	No examples
C	ICP's become Inactive then Active within a month.	Consumption is only calculated for the Active portion of the month.	No examples
D	ICP switches in part way through a month	Consumption is calculated to include the 1st day of responsibility.	Compliant
E	ICP switches out part way through a month	Consumption is calculated to include the last day of responsibility.	No examples
F	ICP switches out then back in within a month	Consumption is calculated for each day of responsibility.	No examples
G	Continuous ICP with a read during the month	Consumption is calculated assuming the readings are valid until the end of the day	Compliant
H	Continuous ICP without a read during the month	Consumption is calculated assuming the readings are valid until the end of the day	Compliant
I	Rollover Reads	Consumption is calculated correctly in the instance of meter rollovers.	Compliant

A manual calculation was also performed using the relevant seasonal adjustment shape files to verify OnGas processes.

OnGas processes were verified as compliant.

5.5 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.

5.6 Forward Estimates (rules 34 & 36)

The rules do not prescribe how forward estimates are to be calculated. OnGas are using Gentrack to calculate the forward estimates. They have been fully reliant on Gentrack since January 2017 (so the 'final' files for January 2016 onwards). The amount of forward estimating they must do is limited because of their high proportion of TOU customers on telemetry and their policy of reading meters once a month. They are also running a spreadsheet validation system of submission files which would pick up inappropriate forward estimates.

Prior to the introduction of Gentrack OnGas had been using a spreadsheet to calculate forward estimates. An issue had arisen with this process in December 2015 which has already been detailed in section 5.3 as it affected the accuracy of initials for that month.

OBSERVATION: It was noted that OnGas staff were unsure of the detail of how Gentrack calculates forward estimates.

RECOMMENDATION: That OnGas establish the detail of how Gentrack calculates forward estimates, confirm they are happy with the approach and document this as a part of their process documentation.

No other issues arose from this review.

5.7 Billed vs Consumption Comparison (rule 52)

A sample reconciliation of GAS070 data for December 2016 and billing data at an ICP level in Gentrack was completed to prove that the file included data for all the ICPs at the sample gas gate. No issues arose from this check.

In section 5.3 regarding initial submission accuracy an issue is outlined that occurred between Flow2E and the new Gentrack billing system that caused problems with the accuracy of the submission files and the 'as billed' files. Consequently, there is a potential breach to report.

> ALLEGED BREACH Incorrect 'as billed' files were submitted for the following ICPs for the stated months due to issues between Flow2E and the new Gentrack billing system (r26.2.1):
>
> Oct-2015 0001017812NG8C8
> Oct-2015 0003063196NG4CA

Oct-2015	0001788282QT04C
Oct-2015	0009001234NG6EF
Oct-2015	0000516901QTBAD
Nov-2015	1000521552PG0D4
Nov-2015	0009001239NG9B4
Jan-2016	1000521552PG0D4
Feb-2016	0078000094PG227
Feb-2016	0008000158NGE1B
Feb-2016	0001833681QTF1E

In section 3.5 an issue was described relating to the historic correction of data for non-TOU sites where there had been meter pressure issues. Historic corrections were done for the following five sites, but these were not picked up in the 'as billed' files because OnGas don't reverse out and re-bill customers.

> ALLEGED BREACH: Incorrect 'as billed' files were submitted as corrections for incorrect meter pressures didn't flow through for the following ICPs (r26.2.1):
>
> 0001446589QT15E
> 1001283684QT3BE
> 0004226800NGEE6
> 1000521165PG6E7
> 0000361941QT6B6

The table below shows a comparison between quantities billed and consumption information submitted to the allocation agent for three years. The consumption information submitted is higher than quantities billed in all three years.

Billed vs Consumption				
Year ending	**Billed GJ**	**Submission GJ**	**Difference GJ**	**% Difference**
December 2016	8,255,346	8,327,221	-71,875	-0.9%
December 2015	8,109,892	8,777,629	-667,737	-7.6%
December 2014	7,373,659	7,391,434	-17,775	-0.2%
Total	23,738,897	24,496,284	-757,387	

The largest discrepancy was in the year ending December 2015 and the largest difference by gas gate in that year was at GTA03610.

Extract from GAR080:

Dec-15	GNGC	GTA03610	UNLG	1727369.909	1897154.659	-169784.75

This difference was further examined. It was identified that the 'as billed' figure for this gate should have been 1,889,967.17 instead of 1,727,369.99. In investigating the cause of this discrepancy it was established that in July 2015, no GAS070 files for June 2015 were submitted for any gas gate.

ALLEGED BREACH: No GAS070 files submitted for June 2015 across all gas gates (r52.2.1).

5.8 Gas Trading Notifications (Rule 39)

A retailer must give notice to the allocation agent when they commence, amend or cease gas supply under a supplementary agreement to a transmission services agreement. They must do this by the third business day of the month following the relevant consumption month of the change.

OnGas had two new supplementary agreements during the audit period. One was found to have been notified within the time limit, the other couldn't be found. (Contract number 1505 with a start date of 1/9/15).

ALLEGED BREACH: No trading notification could be found for contract 1505 with a start date of 1/9/15. Therefore, it was not possible to confirm that it had been sent within the required timeframe or had complied with the other requirements. (r 39)

5.9 Bay of Plenty Event Audit

An analysis of billed versus consumption data for group 4 ICPs was done for the Bay of Plenty gas gates. No issues were identified.

6. Conclusion

The audit found that the OnGas control environment is "effective" for ten of the areas evaluated, "adequate" for three areas and "not adequate" for five areas.

Ten of the eighteen areas evaluated were found to be compliant. Breaches have already been raised by the Allocation Agent with respect to the accuracy of initial submission files (rule 37.2); the accuracy and completeness of information (r26.2.1) and the provision of billed energy quantities on time (r 52.2.1). Eleven new breach allegations are made in relation to the remaining areas. The new alleged breaches are summarised as follows:

- Newly connected ICPs were not included in initial submission files.
- OnGas failed to comply with NZS5259 when converting volume to energy because of inaccurate temperature factors that have not been reviewed
- An issue between Flow2E and Gentrack resulted in incorrect submission files and 'as billed' files, including some incorrect final submission files.
- Inaccuracies in the information submitted regarding metering interrogation

- Corrections for revised meter pressures not been back dated for the full 12 months and the corrections have not flowed through to the 'as billed' files
- A failure to submit 'as billed' files for all gates for one month
- The gas trading notification for a supplementary agreement could not be confirmed as compliant.

In addition to recommending that OnGas address the cause of the alleged breaches, the report also makes the following recommendation:

- That OnGas establish the detail of how Gentrack calculates forward estimates, confirm they are happy with the approach and document this as a part of their process documentation.

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.