RECONCILIATION AUDIT
TRUSTPOWER LTD

Date of audit: 20 to 24 February 2017

Report completed: 27 April 2017

Under the Gas (Downstream Reconciliation) Rules 2008 the Gas Industry Company commissioned Langford Consulting to undertake a performance audit of Trustpower 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 Trustpower 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 Trustpower's control environment is "effective" for thirteen of the areas evaluated, "adequate" for no areas and "not adequate" for three areas. One area was found to be not applicable.

Thirteen of the seventeen areas evaluated were found to be compliant, one was found to be not applicable. Four new breach allegations are made in relation to the remaining areas. Breaches have already been raised by the Allocation Agent with respect to the accuracy of initial submission files (rule 37.2). The breaches are summarised as follows:

- Trustpower failed to comply with NZS5259 when converting volume to energy because of inaccurate temperature factors
- An ICP had no actual meter read for more than 12 months.
- An ICP had no actual meter read for more than 12 months but had been excluded from the over 12 month list.
- Initial submission files adjusted by estimated data at an aggregate gas gate level
- Initial allocations were not within 10% of the final allocation figures

Summary of Report Findings

Issue	Section	Control Rating (Refer to Appendix 1 for definitions)	Compliance Rating	Comments
ICP set up information	2.1	Effective	Compliant	Some issues were identified in the associated audit of the switching rules in relation to new connections but these were found not to have any consequential effect on compliance with the downstream reconciliation rules.
Metering set up information	2.2	Effective	Compliant	Trustpower has robust processes for validating their data against the registry.
Billing factors	2.3	Not adequate	Non-compliant	An issue with the temperature factor for Gisborne led to inaccurate energy conversion. This has however already been addressed.
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	Effective	Compliant	Generally, meter reading attainment processes are robust. One example was identified where the failure to get an actual read was missed due to an input error.

Non TOU validation	3.4	Effective	Compliant	Validation processes are robust.
Non TOU error correction	3.5	Effective	Compliant	An internal audit identified a meter pressure issue where an historic correction had not been done, but this was rectified prior to this audit.
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. There is a recommendation to improve TOU energy conversion by using daily rather than monthly averages for gas type information.
TOU estimation and correction	5.1	Not applicable	Not applicable	There were no examples during the audit period. There were 7 TOU customers who had been with TRUS since the transfer from EDNZ late 2016.
Provision of retailer consumption information	5.2	Not adequate	Not compliant	Trustpower had made some adjustments to initial files at an aggregate rather than an ICP level. This had been identified by internal audit prior to this audit, but was occurring during the audit period so has been recorded as non-compliance. This process has now ceased.
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 due mostly to the proportion of relatively new customers with little or no data history in Trustpower's portfolio of gas customers. A recommendation has been made to review how forward estimates are done when 12 months of data is not available.

Historic estimates	5.4	Effective	Compliant	Compliance was achieved for all scenarios
Proportion of HE	5.5	Effective	Compliant	The correct proportion of HE is being reported.
Forward Estimates	5.6	Effective	Compliant	No forward estimate data remains at the final allocation stage
Billed vs consumption comparison	5.7	Effective	Compliant	No systematic issues were found.

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 20 and 24 February 2017 at Trustpower's offices in Tauranga.

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. It was restricted to the TRUS retailer code.

1.2 Audit Approach

As mentioned in Section 1.1, the purpose of this audit is to assess the performance of Trustpower 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 Trustpower 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. The auditor has used

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 Trustpower'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 the auditors' 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.

1.3 General Compliance

1.3.1 Summary of Previous Audit

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

Trustpower 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
Consumption information not provided to the allocation agent for one new connection ICP	28.3	2.1.1	*The new connections team is now in place. Information is provided on time. A report is in place to monitor performance in this area.*
Altitude figures are incorrect for two ICPs leading to consumption information being over recorded by approx. 4%	28.2	2.1.2	*Altitude figures are now correct for each ICP. A recent internal audit showed robust validation, no further issues were identified.*

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

480 meter pressure discrepancies leading to incorrect consumption information	28.2, 26.2.1	2.2	*Correction for the meter pressure was made following the audit. A recent internal audit showed robust validation. No further issues were identified.*
Incorrect consumption information submitted to the allocation agent for the initial allocation due to genuine zeros being replaced with a default value	26.2.1	5.3	*The default value is now zero.*
Incorrect number of installations recorded in the GAS040 file due to the system counting some ICPs which have switched out or become inactive	31.3,32.3,33.3	5.2	*This is now an automated process. The automation has removed these errors.*
Forward estimates are incorrect because the first day for any new ICP (switched in or activated) is not accounted for. The revision process will correct this, but I consider the information is not complete and accurate.	26.2.1	5.6	*The fix for this is now in place. A recent internal audit showed the process is now accounting for the first day following a switch in or activation. Consumption information was corrected in revision files after this was identified.*
Historic estimate apportionment between months is incorrect because the first day for any new ICP (switched or activated) is not accounted for.	35.1,35.2	5.4	*As above. A recent internal audit found historic estimate calculations were confirmed as correct for continuous ICPs, switched in ICPs and new connections.*
The seasonal adjustment shape file was not loaded and used for April 2014; therefore, apportionment between months was incorrect.	35.3	5.4	*Shape files are now in use. A recent internal audit found the shape files are now allocated to the correct days, leading to accurate apportionment.*

Since the last audit Trustpower had undergone a restructure (approximately 18 months prior to the site visit) and in particular they now have a New Connections team. Trustpower's history had been in the electricity sector but their gas business is growing and in the last 6 to 8 months they have focused more attention on their gas processes. They use Gentrack Velocity 2012/13 (GTV) as their core IT system, and this was upgraded in August 2015.

Trustpower acquired the Energy Direct business in 2013, but operated this as a separate business up until late 2016. In Sep/October 2016 the EDNZ ICPs were transferred in to the main Trustpower business and are now held under the TRUS retailer code.

Trustpower conducted an internal audit of their gas processes in October 2016 and had made some consequent improvements. The results of this internal audit were made available to the auditor.

1.3.2 Breach Allegations

Trustpower has 24 alleged breaches recorded by the Market Administrator in the period June 2014 to December 2016, representing 304 underlying breaches. 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	21	5.3
Error in 'as billed' data; Missing initial consumption	26.2	2	5.7 5.3
Sites with incorrect status codes	26.5	1	2.1

This audit raises the following additional breach allegations.

Breach Allegation	Rule(s)	Section in this report
Trustpower failed to comply with NZS5259 when converting volume to energy because of inaccurate temperature factors	28.2	2.3.1
An ICP had no actual meter read for more than 12 months.	29.4.3	3.3

An ICP had no actual meter read for more than 12 months but had been excluded from the over 12 month list.	40.2	3.3
Initial submission files adjusted by estimated data at an aggregate gas gate level	34.1	5.2

1.4 Provision of Information to the Auditor (rule 69)

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

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

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

1.5 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.

A sample of new connections ICPs were checked for correct inclusion in consumption submission files. No issues were found.

Analysis from the switching and registry management audit found, among a sample of new connections, 3 status updates that were not done within 2 business days of entering a contract. These 3 breaches were caused due to internal system issues within GTV that Trustpower were unaware of at the time. The file generated from within GTV and being sent to the registry failed and there was no process to identify those failures. Now that Trustpower are aware this failure is possible they have created reports that are auto delivered and worked daily to advise of failures.

A further check was made to see if these registry update failures had a consequential effect on the submission of consumption data under the downstream reconciliation rules. It was found that because Trustpower's GTV system did contain the correct information the correct consumption data was included in the consumption files submitted to the allocation agent, despite the registry update failure.

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.

Trustpower provided a registry list file which was reviewed for obvious outliers. A random sample of ICPs per 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. No altitudes were found to be incorrect by +/- 20m among the outliers or from the sample check.

A further evaluation was conducted of ICPs where the altitude figure was zero on the registry. Two were found with an altitude difference of more than 20m, but both had an altitude of less than 50m 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 Trustpower's system were compared against the information in the registry for gas gate; meter pressure; dials and multiplier. No discrepancies were found, the validation processes in place were found to be robust.

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.

Trustpower 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	TRUS temp	TRUS factor	Diffce %
Aug-16	Te Puke 30cm	10.22	1.016868405	Mt Maunganui	10.9	1.01443408	0.243433
Aug-16	Hamilton Ruakura 20cm	9.61	1.019062102	Hamilton	10.5	1.01586462	0.319748
Aug-16	Auckland Motat 20cm	11.46	1.012438073	Westfield	11.4	1.01265156	-0.02135
Aug-16	Whangerei 20cm	12.45	1.008928571	Whangarei	12.6	1.00839895	0.052962
Aug-16	Rotorua 20cm	8.9	1.021627371	Rotorua	10.9	1.01443408	0.719329
Aug-16	Gisborne 10cm	10.67	1.015256148	Gisborne	8.3	1.02380529	-0.85491
Aug-16	Wellington 20cm	8.95	1.021446296	Waitangirua	9.9	1.01801802	0.342828
Aug-16	Upper Hutt 20cm	8.34	1.02365981	Tawa A	9.4	1.0198195	0.384031
Aug-16	Paraparaumu	9.19	1.020578026	Paraparaumu	9.9	1.01801802	0.256001
Feb-16	Te Puke 30cm	23.04	0.972855262	Mt Maunganui	21.8	0.97694524	-0.409
Feb-16	Hamilton Ruakura 20cm	22.7	0.973973297	Hamilton	21	0.97960224	-0.56289
Feb-16	Auckland Motat 20cm	23.92	0.969973407	Westfield	21.3	0.97860418	-0.86308
Feb-16	Whangerei 20cm	25.39	0.965197293	Whangarei	23.2	0.97233002	-0.71327
Feb-16	Rotorua 20cm	20.08	0.982675715	Rotorua	21.8	0.97694524	0.573047
Feb-16	Gisborne 10cm	23.16	0.972461274	Gisborne	17.7	0.99071686	-1.82556
Feb-16	Wellington 20cm	20.28	0.98200593	Waitangirua	20.7	0.98060235	0.140358
Feb-16	Upper Hutt 20cm	22.68	0.974039144	Tawa A	18.7	0.98732225	-1.32831
Feb-16	Paraparaumu	21.7	0.977276581	Paraparaumu	20.7	0.98060235	-0.33258

It is acknowledged that the NIWA data that Trustpower's 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 Trustpower for Gisborne were significantly different from the NIWA values. This was an issue already identified by Trustpower in an internal audit in October 2016. Further investigation had shown that the temperature for Motu, located approximately 80 kms inland of Gisborne, was being used and that these were significantly lower than for the coastal area of Gisborne. These have now been replaced by the NIWA temperatures for Gisborne 10cm.

Trustpower had also applied an historical correction for one of their Gisborne customers, as this customer accounts for half of their consumption at this gate. This customer was acquired in December 2015 so there was no 'final' data affected that has not been corrected.

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

Trustpower is aware that they have a system restriction such that temperatures cannot be applied for specific dates or date ranges. They have logged a job to have this changed, such that if there is an industry change to this process where temperature data is supplied to retailers for specific dates or date ranges their systems will be able to accommodate this.

> OBSERVATION: There are significant challenges in getting historical data for a long period at sufficient locations, at 30 cm ground temperature or that can be used to approximate to 30cm ground temperature. Any process will require compromises in the approach to estimation.

RECOMMENDATION: That the industry produces a single temperature data table that could be used by all retailers. This would be both more efficient (retailers are likely to each replicate a significant amount of effort undertaking analysis to land on the best approach to establishing compliant temperature data) and produce a more consistent result across retailers. This has previously been recommended and is understood to be being progressed.

2.3.2 Calorific Values

Gas composition data is sourced from the Open Access Transmission Information System (OATIS) automatically. A sample check of the Calorific Value, CO2, N2, and SG as well as the table of gas types used by gas gate was checked back against the OATIS source. 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 origin.

Sample meter read data was also verified against the data used in GTV 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 allcoation group that the consumer installation falls within and the interrogation requirements that apply depending on the type of metering and allocation group.

Trustpower conducts analysis of consumption on a regular basis (two or three times a week) to ensure ICPs are in the correct allocation groups. This reporting and review process was found to be robust. A check was done to ensure that ICPs reallocated to a different group were changed in both GTV and the registry. No issues were identified.

Trustpower also report on differences between allocation group and load shedding category. Differences found are raised with the relevant distributor.

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).

Trustpower provided a list of ICPs in advance of the on-site visit, not read in the previous 4 months and the previous 12 months. The list contained 7 ICPs that had not been read in the last 4 months and 0 ICPs not read in the last 12 months.

A sample of ICPs not on either list were reviewed and were found to have recent reads that meant they were correctly not on either of these lists, suggesting that the reporting was accurate.

All ICPs on the 'over 4 months' list were reviewed. One was found to have had customer reads for several months, one of which had been incorrectly entered as an actual read. This ICP should have been identified as not having an actual read for over 12 months, but had not been due to the incorrect data entry of 'actual' read rather than customer read. This had the consequence of two breaches, one regarding the failure to do an actual read and one regarding the failure to report the ICP in the over twelve month report.

- ALLEGED BREACH ICP 0000469411QT3BD had no actual meter read for more than 12 months (rule 29.4.3)
- ALLEGED BREACH ICP 0000469411QT3BD had no actual meter read for more than 12 months but had been excluded from the over 12 month list (rule 40.2).

The 4 month list and the 12 month list were also re-run during the site visit, with 27 ICPS on the over 4 month list and none on the over 12 month list.

The table below shows the GAS080 results for September 2016 when 2 ICPs were returned as not meeting the over 12-month target.

Target	**Reading Percentage (GAS080) September 2016**
Rolling 4-month (target 90%)	99.93%
12-month (target 100%)	99.99%

Other than the exception detailed above, Trustpower 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

The first layer of validation occurs when Trustpower staff record meter readings as their handheld devices include some validation checks. Their Billing team (who work across all utilities) review higher risk situations, including all first bills, approximately 10% of all bills. Revenue Assurance may work approximately 1,000 higher risk bills per day. Most of the exception identification rules are pre-populated in the Gentrack software, but Trustpower can fine tune these for example by changing

thresholds for certain parameters. Staff identify causes and propose resolutions for each type of validation. Anything requiring calculations are referred to a specialist team for assistance.

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 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.

An internal audit had identified an issue with the historical correction process, where Trustpower did an incremental correction using average factors. This process had now changed and they reverse and rebill the invoice so that the actual conversion factors for the correct period are now used.

A correction done in November for a large meter pressure discrepancy was viewed and the consumption followed through on the initial submission, the interim submission and the 'as billed' figures. It was possible to see the corrected consumption being reversed out and the revised consumption being submitted.

No issues were identified with the correction process.

3.6 TOU Validation

Trustpower's TOU data is not on telemetry so is received at the end of the month via e-mail from meter readers. The data received is managed in Excel.

The validation processes were reviewed, which included noting overruns as indication of unexpected consumption and discussions with the key account manager to validate unusual patterns of usage.

No issues were identified during the review of TOU validation.

4. Energy Consumption Calculation (rule 28.2)

The energy calculation completed by Trustpower's GTV system was verified manually using an Excel spreadsheet which converts volume between meter readings to volume at standard conditions and then to energy consumption. The relevant information for a sample non TOU ICP was identified from source and the conversion factors for temperature, pressure, altitude and compressibility were all calculated manually in the spreadsheet. Meter readings were then entered and the energy conversion for a billing period computed.

A sample TOU ICP was also selected and the energy conversion replicated manually. It was noted that the CV used in the calculations were specific to the day, while the other gas type data used in the compressibility calculation was an average across the month. While this would not have led to an

energy conversion error exceeding NZS5259 this would have led to energy conversions less accurate than could be achieved by using the actual gas type information for each day.

> RECOMMENDATION: That Trustpower use the gas type information for each specific day when calculating TOU energy conversion rather than average figures for the month.

No other issues arose from either of these replications.

5. Estimation and Submission Information

5.1 TOU Estimation and Correction (rule 30.3)

Trustpower had no TOU estimations or corrections to review.

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

Trustpower'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 a recent month was examined and compared to the data in GTV at ICP level; the totals matched which confirms compliance. This also demonstrates that consumption information provided to the Allocation Agent is calculated at ICP level and then aggregated.

A check of a 'final' file was also made, which also confirmed the file submitted was an accurate aggregation of data at an ICP level. Each ICP at the sample gate was also viewed in GTV to demonstrate there were actual reads, i.e. that this final data contained no estimates as the submitted file reported.

The October 2016 internal audit had identified an issue with the initial submission files, as some contained estimates, adjusting the data in the file at an aggregate level. This was discussed as a part of this audit. Trustpower's intention had been to improve the quality of the 'initial' data. The process had been to pull the 'initial' data, then to get this reviewed by the trading team. If an adjustment was thought to be appropriate this was added as an extra site without an ICP, labelled as an estimate so only added into the first column of the data. This had only been done for Auckland and four other larger gas gates across four months (June to September 2016). The amounts involved were:

> +3,144 GJs in June 2016
>
> -1,129 GJs in July 2016
>
> -4,668 GJs in August 2016
>
> -441 GJs in Sept 2016

The practice was ceased after the internal audit so no 'final' data has been affected. The auditor reiterated the internal auditors report that the addition of adjustments to initial data at an aggregate

level was not compliant with the rules. In any event Trustpower had found that the adjustments had not achieved the purpose of improving data accuracy.

- ALLEGED BREACH Adjusting initial submission files by estimated data at an aggregate gas gate level which is not compliant with the requirement to submit aggregate energy quantities for all consumer installations or with estimates being made at a consumer installation level (rule 34.1)

A comparison of a GAS040 file and a file sent to a distributor was used to demonstrate that inactive sites with consumption are correctly included in the GAS040 submission file. An example ICP was also viewed.

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%.

Trustpower did not meet this requirement for several gas gates during the 12-month period reviewed. The results are summarised in the table below. In total over this period there were 63 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
November 2014	58	11	19.0%	52	89.7%
December 2014	58	2	3.4%	52	89.7%
January 2015	57	6	10.5%	51	89.5%
February 2015	59	27	45.7%	59	100%
March 2015	59	36	61.0%	59	100%
April 2015	59	7	11.9%	53	89.8%
May 2015	61	2	3.3%	52	85.2%
June 2015	61	5	8.2%	52	85.2%
July 2015	61	16	26.2%	55	90.2%
August 2015	61	34	55.7%	61	100%
September 2015	62	14	22.6%	57	91.9%

October 2015	62	6	9.7%	52	83.9%

The following table shows the difference between consumption information for initial and final submissions at an aggregated level for all gas gates. This demonstrates non-compliance of the 10% accuracy level in 9 out of 12 months.

Month	**Initial Submission All Gas Gates (GJ)**	**Final Submission All Gas Gates (GJ)**	**Percentage Variation**
November 2014	19,382	15,436	25.6%
December 2014	17,750	13,219	34.3%
January 2015	14,493	10,788	34.3%
February 2015	11,690	11,085	5.5%
March 2015	13,554	13,953	-2.9%
April 2015	15,883	19,498	-18.5%
May 2015	23,313	33,571	-30.6%
June 2015	35,066	45,699	-23.2%
July 2015	48,083	55,784	-13.8%
August 2015	54,585	53,178	2.6%
September 2015	50,945	45,333	12.4%
October 2015	44,399	32,404	37.0%

Breaches have already been alleged so not repeated here, but this is area is listed as generally non-compliant in the summary.

Analysis of initial versus final differences at some of the worst gates/months showed that generally the problem was new customers where Trustpower had little or no actual data on which to base estimates.

A few discrete issues such as a new site being wrongly included in group 6 and subsequently being moved to group 4 and a switched in group 4 site having its start date backdated, created one-off issues for particular gates in specific months. Generally, the issue with estimating new customers looked to be the only systematic issue because of Trustpower's situation as a relatively new retailer with a

disproportionately large ratio of customers with less than 12 months history. This issue is likely to resolve itself as the retailer's customer database matures.

RECOMMENDATION: That Trustpower reviews how forward estimates are produced for newer customers where they do not hold 12 months of historical data, particularly with respect to adjusting for seasonality.

5.4 Historic Estimates (Rules 34 & 35)

To assist with determining compliance of the historic estimate processes, Trustpower was supplied with a list of scenarios. Trustpower provided an example for each scenario and all 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.	Compliant
B	ICP becomes Inactive part way through a month.	Consumption is only calculated for the Active portion of the month.	Compliant
C	ICP's become Inactive then Active within a month.	Consumption is only calculated for the Active portion of the month.	Compliant
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.	Compliant
F	ICP switches out then back in within a month	Consumption is calculated for each day of responsibility.	Compliant
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	Compliant

		valid until the end of the day	
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 file to verify Trustpower's processes.

Trustpower's 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. Trustpower processes correctly calculates and reports the proportion of HE.

5.6 Forward Estimates (rules 34 & 36)

The rules do not prescribe how forward estimates are to be calculated. Trustpower's Gentrack system estimates out continuously. The system uses 3 months worth of data (the same quarter of the year for established customers and the last three months for newer customers). If necessary, it will use billed estimates using average loads.

If there is not enough data to use previous year or previous periods it will base the forward estimate on

- The billed consumption if the site has been billed
- The average daily load if the site has not been billed yet

Billed consumption – if it is the very first bill and the site hasn't had a read then the bill will estimate using the "tariff average" which is set against the charge on the consumer pricing plan. These are set by the pricing team. Since most gas sites are read monthly this would not be too common.

Average daily load – this is only used if the site has not had a bill at all yet. It comes from the switching file from the previous retailer and is simply divided to get a daily average.

By the time of the final allocation, forward estimates should have been replaced with historic estimates. Three months of final data was reviewed for Trustpower and no forward estimates remained.

5.7 Billed vs Consumption Comparison (rule 52)

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

There had been an issue with credits not flowing through correctly but this had been corrected post the Tauranga event audit and was demonstrated to no longer be an issue.

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 lower than quantities billed in the most recent year and higher in the two earlier years.

Billed vs Consumption				
Year ending	**Billed GJ**	**Submission GJ**	**Difference GJ**	**% Difference**
September 2016	505,016	489,841	15,175	3.1%
September 2015	343,941	346,625	-2,685	-0.8%
November 2014	136,520	139.412	-2,893	-2.1%
Total	**985,477**	**975,878**	**9,597**	**1.0%**

The largest discrepancy was in the year ending September 2016.

Trustpower had done some analysis of billed v submitted data in November 2016 post their internal audit. This had been done using data from longer ago (i.e. so that it excluded 'initial' data). This had shown an alignment of within 1%, although Trustpower will continue to monitor differences.

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 Trustpower's control environment is "effective" for thirteen of the areas evaluated, "adequate" for no areas and "not adequate" for three areas. One area was found to be not applicable.

Thirteen of the seventeen areas evaluated were found to be compliant, three non-compliant and one was found to be not applicable. Four new breach allegations have been made in relation to the remaining areas. Breaches have already been raised with respect to the accuracy of initial submission files. The breaches are summarised as follows:

- Trustpower failed to comply with NZS5259 when converting volume to energy because of inaccurate temperature factors
- An ICP had no actual meter read for more than 12 months.
- An ICP had no actual meter read for more than 12 months but had been excluded from the over 12 month list.
- Initial submission files adjusted by estimated data at an aggregate gas gate level.
- Initial allocations were not within 10% of the final allocation figures.

In addition to recommending that Trustpower address the above alleged breaches the report also makes the following recommendations:

- That Trustpower improve TOU energy conversion by using daily rather than monthly averages for gas type information.
- That Trustpower reviews how forward estimates are produced for newer customers where they do not hold 12 months of historical data, particularly with respect to adjusting for seasonality.
- That the industry produces a single temperature data table that could be used by all retailers. This is understood to be underway

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 – Response to comments on draft report

Comments on the draft report were received from Contact Energy. The comments and the responses are noted below.

Comment from Contact Energy	Response
General comment regarding scope: The report mentions that Trustpower acquired the EDNZ business in 2013 and operated it as a separate entity until Sept / Oct 2016 – can you please clarify that both EDNZ and TRUS operations were included as part of the scope of this performance in a similar way that the 3 Genesis's Retailer codes (GENG, GEND, GOEL) were audited. I believe this audit needs to be across both EDNZ and TRUS retailers codes as wash ups for periods prior to Sept 2016 still need to be performed for EDNZ retailer code by Trustpower.	The scope of the audit was specifically restricted to the TRUS code. A statement to make this clear has been added to section 1.1
Section 1.5 Transmission methodology and audit trails: Can you please confirm in your report that the excel spreadsheets for TOU gas data, that are supplied via email to Trustpower (as described in section 3.5) were included in your assessment of this requirement?	Confirmed that the assurance given in section 1.5 includes the TOU data (but note the restriction to the scope of this audit mentioned above).
Section 2.3 Billing factors: There is no mention in this report relating to whether Trustpower are applying Joule Thomson Effect factor as part of their volume to energy conversion. Can you please clarify this and if Trustpower are not applying this factor and should a recommendation be added to this report as similar recommendations have been made in previous gas performance audits for other retailers.	Trustpower are applying Joule-Thomson.

Section 3.5 Non TOU error correction: Can you please clarity as part of this section that Trustpower has active controls and processes to identify and investigate potential gas stopped meters? The reason why I feel it is necessary to verify that a gas stopped meter identification and investigation process exists is that Contact is seeing a particular meter manufacturer / model as becoming an issue in relation to complete failure to measure gas volumes – I would hope all retailers are also seeing this trend and are actively managing their risks and obligations.	Trustpower have processes to identify stopped meters.

Section 3.6 TOU Validation: Can you please clarify that the validation process also looks at lower than expected consumption is also investigated as an unusual consumption pattern as this is an indicator that there may be an underlying issue with the meter or corrector – this report only notes high consumption as an example of the validation process. Also, there is no mention of any validation performed on the measured pressure and measured temperature values provided in the excel file from the meter readers. The reason why I raise this point is recently we have experienced 2 temperature transducer failures resulting in the measured temperature incorrectly being recorded in excess of 70 degrees Celsius by the corrector – our settlement system validations detected this and we were able to get the affected temperature transducer replaced and then perform a correction of the volumes accordingly. Similar failures of pressure transducers can also occur if measure pressure is not monitored against the expected regulator set pressure. Given that Trustpower perform their Gas TOU validation manually via excel I believe it is important that this audit report explicitly states all validations that are being performed manually to provide comfort that sufficient controls are in place. There is no mention of how Trustpower monitors the corrector / logger time and performs clock synchronisation of their manually downloaded Gas TOU sites. Appendix B of NZS 5259 sets out this requirement and identifies the responsibility for this obligation on the user of the data, namely the retailer. Can you please clarify how Trustpower achieves this requirement. Finally – there is no mention whether Trustpower review the corrector event logs to ensure these devices are operating as expected – issues such as critical low battery alarm and logger memory issues can be identified by reviewing this source of information.	Confirmed that lower consumption, measured temperature and pressure are all part of Trustpower's TOU validations. They also have processes to identify corrector issues.

Section 5.1 TOU estimation and correction: It is pleasing to see that the Gas TOU devices that Trustpower are retailer for are operating reliably. Contact has a similar number of Gas TOU sites and in the last 3 years we have experienced 3 battery failures, 2 corrector failures, 2 temperature transducer failures and 2 general meter / corrector replacements on sites with a bypass stream. All of these instances has required some form of data estimations. Are you able to clarify that as part of your review that Trustpower were able to confirm no such meter / corrector issues have occurred on their Gas TOU sites since the last EDNAZ and TRUS gas performance audit and there is a possibility that a required estimation has been missed?	This is confirmed, but note the restriction of this audit to the TRUS code and therefore the relatively short time under review.
Section 5.2 – Provision of Retailer Consumption Information: Can you please confirm that only initial submission files were manually adjusted at an aggregate level and no interim files were affected. If only initial files were affected then I believe there may be no actual market impact as the D+1 special allocations would have been used by the market – however if interim files were also affected then there would have been an adverse impact to the daily balancing calculations affecting all retailers in some way and I believe this impact should be identified in this report.	Confirmed that this issue only related to initial data.