

VERITEK

Gas Downstream Reconciliation Performance Audit Final Report

For

Trustpower Limited



Prepared by Steve Woods – Veritek Ltd

Date of Audit: 09/06/20 & 11/06/20

Date Audit Report Complete: 06/11/20

Executive Summary

This Performance Audit was conducted at the request of the Gas Industry Company (GIC) in accordance with Rule 65 of the Gas (Downstream Reconciliation) Rules 2008 effective from 14 September 2015.

The purpose of this audit is to assess the systems, processes and performance of Trustpower Limited (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: the commissioning and carrying out of performance audits and event audits, V3.0" which was published by GIC in June 2013.

The summary of report findings in the table below shows that Trustpower's control environment is "effective" for 16 of the areas evaluated, "adequate" for one area and not adequate for one area.

13 of the 19 areas evaluated were found to be compliant. Five breach allegations are made in relation to the six remaining areas. They are summarised as follows:

- temperature information was incorrect for the Gisborne (GIS07810) gas gate, leading to a conversion error of 1.14%,
- 88 ICPs have the incorrect allocation group,
- meter pressure corrections were not backdated to the correct start date for 21 ICPs,
- consumption information not submitted for the initial allocation for at least five ICPs, and
- the initial submission accuracy did not meet the required accuracy percentage for some gas gates for the period January 2018 to December 2018

Summary of Report Findings

Issue	Section	Control Rating (Refer to Appendix 1 for definitions)	Compliance Rating	Comments
Transmission methodology and audit trails	1.5	Effective	Compliant	No issues were identified.
ICP set up information	2.1	Effective	Not compliant	The registry was populated late for five new connections resulting in submission information not being provided for the initial allocation.
Metering set up information	2.2	Effective	Compliant	Validation is in place for all metering fields.
Billing factors	2.3	Effective	Not compliant	Trustpower now uses the temperature data published by GIC. There was an error for Gisborne prior to the adoption of the new temperature data.
Archiving of reading data	3.1	Effective	Compliant	Effective practices are in place for archiving of register reading data.
Meter interrogation requirements	3.2	Adequate	Not compliant	88 ICPs appear likely to have an incorrect allocation group currently recorded. I recommend improving reporting and controls to ensure allocation groups are corrected as soon as practicable.
Meter reading requirements	3.3	Effective	Compliant	Meter reading attainment processes are robust.

Issue	Section	Control Rating (Refer to Appendix 1 for definitions)	Compliance Rating	Comments
Non TOU validation	3.4	Effective	Compliant	<p>Validation processes are generally sound.</p> <p>I recommend improving “zero consumption” reporting to enable filtering of records to exclude records where the zero consumption is likely to be correct. Build in the capability to “flag” records that have previously been confirmed as “false positives”.</p>
Non TOU error correction	3.5	Not adequate	Not compliant	Corrected data automatically flows through to the relevant revision files for stopped meters and altitude changes. Meter pressure corrections were not backdated to the correct start date for 21 ICPs.
TOU validation	3.6	Effective	Compliant	Robust TOU validation processes are in place.
Energy consumption calculation	4	Effective	Compliant	<p>TOU</p> <p>The process to convert TOU consumption to energy is compliant.</p> <p>Non TOU</p> <p>GTV is calculating pressure, altitude and temperature factors correctly for non TOU ICPs.</p> <p>Compressibility correction occurs for ICPs with meter pressure over 50kPa.</p>
TOU estimation and correction	5.1	Effective	Compliant	Trustpower’s processes achieve compliance with the requirement to provide its “best estimate of consumption information”.

Issue	Section	Control Rating (Refer to Appendix 1 for definitions)	Compliance Rating	Comments
Provision of retailer consumption information	5.2	Effective	Not compliant	The process for preparing consumption information files is generally robust. There were at least five ICPs where consumption information was not submitted for initial allocation due to backdated set up for new connections.
Initial submission accuracy	5.3	Effective	Not compliant	Trustpower uses historic seasonal adjustment daily shape values to improve the accuracy of forward estimates. Although compliance has not been achieved, the process is robust.
Forward estimates	5.4	Effective	Compliant	Trustpower uses historic seasonal adjustment daily shape values to improve the accuracy of forward estimates.
Historic estimates	5.5	Effective	Compliant	Compliance was achieved for all of the scenarios provided during the audit.
Proportion of HE	5.6	Effective	Compliant	Reporting has been provided as required.
Billed vs consumption comparison	5.7	Effective	Compliant	No issues were identified.
Gas Trading Notifications	5.8	Effective	Compliant	Processes are in place to ensure that trading notifications are issued where required.

Persons Involved in This Audit

Auditor:

Steve Woods
Veritek Limited

Trustpower personnel assisting in this audit were:

Name	Title
Leanne Ellis	Reconciliation Analyst
Rachel Falconer	Team Leader: Assurance, Collections & Dispatch
Anita Stokes	Bill Data Manage
Teresa Stewart	Lead Bill Data Specialist
Jessie Cox	Billing Manager
Carolyn Green	Team Leader - Billing
Andrew Devine	Reconciliation Analyst

Service providers assisting with processes within the audit scope:

Company	Processes
Meter Reading Services	Gathering and storing raw meter data
Wells Instrument & Electrical Services Ltd	Gathering and storing raw meter data and TOU downloads
Powerco	TOU downloads
Electrix	TOU downloads

Contents

Executive Summary	2
Summary of Report Findings	3
Persons Involved in This Audit	6
Contents	7
1. Pre-Audit and Operational Infrastructure Information	9
1.1 Scope of Audit	9
1.2 Audit Approach	9
1.3 General Compliance	10
1.3.1 Summary of Previous Audit	10
1.3.2 Breach Allegations	11
1.4 Provision of Information to the Auditor (Rule 69)	11
1.5 Draft Audit Report Comments	12
1.6 Transmission Methodology and Audit Trails (Rule 28.4.1)	12
2. Set-up and Maintenance of Information in Systems (Rule 28.2)	13
2.1 ICP Set Up Information	13
2.1.1 New Connections Process	13
2.1.2 Altitude Information	14
2.2 Metering Set-up Information	15
2.3 Billing Factors	16
2.3.1 Temperature Information	16
2.3.2 Calorific Values	17
3. Meter Reading and Validation	18
3.1 Archiving of Register Reading Data (Rule 28.4.2)	18
3.2 Retailer to Ensure Certain Metering Interrogation Requirements are Met (Rule 29)	18
3.3 Meter Reading Requirements (Rules 29.4.3, 29.5 & 40.2)	19
3.4 Non TOU Validation	20
3.5 Non TOU Error Correction	21
3.6 TOU Validation	22
4. Energy Consumption Calculation (Rule 28.2)	22
5. Estimation and Submission Information	23
5.1 TOU Estimation and Correction (Rule 30.3)	23
5.2 Provision of Retailer Consumption Information (Rules 30 to 33)	23
5.3 Initial Submission Accuracy (Rule 37.2)	25
5.4 Forward Estimates (Rules 34 & 36)	27
5.5 Historic Estimates (Rules 34 & 35)	27
5.6 Proportion of Historic Estimates (Rule 40.1)	28

5.7	Billed vs Consumption Comparison (Rule 52)	28
5.8	Gas Trading Notifications (Rule 39)	28
6.	Recommendations	29
	Appendix 1 – Control Rating Definitions	30
	Appendix 2 – Trustpower Comments	31

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 Gas (Downstream Reconciliation) Rules 2008 effective from 14 September 2015. Rule 65 is inserted below:

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

The audit was conducted in accordance with terms of reference prepared by the GIC, and in accordance with the "Guideline note for rules 65 to 75 and 80: the commissioning and carrying out of performance audits and event audits, V3.0" which was published by GIC in June 2013.

The audit was carried out on June 9th and 11th 2020. The audit was conducted by video conference due to the Covid-19 travel restrictions.

The scope of the audit includes "downstream reconciliation" only. Switching, metering ownership and data collection functions are not within the audit scope.

1.2 Audit Approach

As mentioned in **section 1.1** the purpose of this audit is to assess the performance of 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. I have used my professional judgement to determine the audit method and to select sample sizes, with an objective of ensuring that the results are statistically significant.¹

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

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 my judgement, ensures the result has statistical significance.

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

1.3 General Compliance

1.3.1 Summary of Previous Audit

Trustpower provided a copy of their previous audit conducted in 2017 by Julie Langford. Seven breach allegations were made, and resolution of these matters is summarised in the table below:

Breach Allegation	Rule	Section in this report	Resolution
Trustpower failed to comply with NZS5259 when converting volume to energy because of inaccurate temperature factors.	28.2	2.3.1	There was still a discrepancy for one gas gate, but this is now resolved because Trustpower is using the temperature data supplied and published by GIC.
An ICP had no actual meter read for more than 12 months.	29.4.3	3.3	No further examples were identified during this audit.
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	This matter is now resolved.
Initial submission files adjusted by estimate data at an aggregate gas gate level.	34.1	5.2	This matter is now resolved.

1.3.2 Breach Allegations

Trustpower has 21 alleged breaches recorded by the Market Administrator between 1 March 2017 and 20 April 2020 excluding the seven alleged breaches raised in relation to the 2017 performance audit. All breach allegations are for variances between initial and final allocations (rule 37.2).

As noted in the Summary of Report Findings, this audit recorded non-conformance in six sections leading to five breach allegations, as shown in the table below.

Breach Allegation	Rule	Section in this report
Temperature information was incorrect for the Gisborne (GIS07810) gas gate, leading to a conversion error of 1.14%. Temperature data is now sourced from the GIC's website; therefore, the controls are now effective, and the matter is resolved for future submissions.	26.5.4	2.3.1
88 ICPs have the incorrect allocation group.	29.2 & 29.3	3.2
Meter pressure corrections were not backdated to the correct start date for 21 ICPs.	26.2.1 & 26.3	3.5
Consumption information not submitted for the initial allocation for all five ICPs checked where the active status was backdated.	26.2.1 & 28.3	5.2
The initial submission accuracy did not meet the required accuracy percentage for some gas gates for the period January 2018 to December 2018	37.2	5.3

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.

1.5 Draft Audit Report Comments

A draft audit report was provided to the industry body (GIC), the allocation agent, and allocation participants that I considered had an interest in the report. In accordance with rule 70.3 of the 2015 Amendment Version of the Gas (Downstream Reconciliation) Rules 2008, those parties were given an opportunity to comment on the draft audit report and indicate whether they would like their comments attached as an appendix to the final audit report. The following responses were received:

Party	Response	Comments provided	Included in report
Trustpower	Yes	Yes	Yes

The comments received will be considered in accordance with rule 71.1, prior to preparing the final audit report. Trustpower's comments are included in the relevant sections where issues were raised.

1.6 Transmission Methodology and Audit Trails (Rule 28.4.1)

The audit trail was evaluated for all data gathering, validation and processing functions. This rule requires that "The consumption information supplied to the allocation agent in accordance with rules 29 to 40 is transferred in such a manner that it cannot be altered without leaving a detailed audit trail..."

A sample of GAS040 and GAS050 reports submitted on the Allocation Portal were checked against the original reports in Trustpower's system. This check confirmed that the original files were still available, and that they had not been edited after the submission date and time.

Supporting information for TOU corrections is appropriately filed and was available during the audit.

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

Every retailer must ensure the conversion of measured volume to volume at standard conditions and the conversion of volume at standard conditions to energy complies with NZS 5259:2015, 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. I have also considered the Gas (Downstream Reconciliation) Rules 2008 Billing factors guideline note v1.0 (Billing Factors Guideline) published by GIC on 30/11/2015 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.

New connections are managed via the networks' portals. Progress notifications are automatically generated, and the relevant details are loaded into GTV.

One of the main issues with the new connections process is that the physical connection is made at the property when the ICP is still at the "Ready" status, and at this point the consumer hasn't necessarily registered with a retailer.

Consumption information may not be provided to the allocation agent until the registry is updated, which means that for some ICPs where the status has changed to ACTC, consumption information has not been provided to the allocation agent for the initial allocation.

The "Maintenance Breach History Report (RET breaches)" report was examined for the period January 2019 to March 2020. This report contained 262 ICPs where the initial registry update was later than two business days, out of a total of 590 new connections. I checked the records for five ICPs where the registry update was more than 15 business days late. In all cases, consumption information was provided to the allocation agent at the first available opportunity after the claim date. Consumption information was not provided to the allocation agent for the initial allocation for any of the five ICPs.

There are two issues causing late registry updates. Some were due to errors at the time of populating GTV, and some were due to a system issue preventing the automated registry update in cases where TRUS is not the proposed retailer. Weekly reporting is run to identify these issues.

I checked the "RSREADY" report to identify ICPs at Ready, where Trustpower is the proposed retailer to ensure they were loaded into GTV. There was one record and it was loaded correctly into GTV.

Trustpower has a set of validation processes and reports to identify and resolve discrepancies, which was demonstrated during the audit. The validation compares GTV data to registry data for all relevant fields. Whilst reporting is in place to identify discrepancies, there appear to be delays with the resolution of some of these discrepancies, which will sometimes have an effect on billing and reconciliation. This is discussed further in **section 5.2**.

2.1.2 Altitude Information

It is a distributor's 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 5259:2015, which was published in November 2015, contains the following requirements regarding the way that altitude information should be managed.

1. The maximum permissible error is $\pm 1.0\%$ where the meter pressure is less than or equal to 100kPa, and $\pm 0.5\%$ where the meter pressure is greater than 100kPa.
2. The following note is also included "Altitude should be determined within 10m where practicable."

A random sample of non TOU ACTC or ACTV ICPs per distributor from the registry list as at 20/03/20 were checked against "google earth" data. The sample was selected by choosing five ICPs with altitudes under 11m and five ICPs with altitudes over 140m per distributor, then choosing a further ten ICPs with altitudes between 11m and 140m per distributor. The "google earth" data is based on the "Shuttle Radar Topography Mission" (SRTM) results and a number of recent studies indicate an accuracy of $\pm 10m$ 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 $\pm 1.0\%$.

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 $\pm 10m$, therefore, to allow for this margin, I have checked that the registry data is within 20m of "google earth" data.

As shown in the table below the altitude data on the registry for non TOU ICPs appears to be very accurate in all areas.

Distributor	Total ACTC and ACTV non TOU ICPs	ICPs checked	Quantity outside 20m	Quantity outside 90m
UNLG	7,773	20	-	-
NGCD	12,043	20	-	-
POCO	11,893	20	-	-
GNET	2,887	20	-	-
Total	34,596	80	-	-

A further evaluation was conducted of ICPs where the altitude figure was zero on the registry. This data also appears to be very accurate, with no discrepancies identified.

Distributor	Total ACTC and ACTV non TOU ICPs	ICPs with altitude of zero	ICPs checked	Quantity outside 20m	Quantity outside 90m
UNLG	7,773	1	1	-	-
NGCD	12,043	88	20	-	-
POCO	11,893	17	17	-	-
GNET	2,887	-	-	-	-
Total	34,596	106	38	-	-

Altitude adjustments are applied for TOU ICPs, which all have TG register content codes. TOU gas conversion was checked for two ICPs and I confirmed that the altitude factors were correctly calculated and applied.

Altitude is stored in GTV and there is regular validation between GTV and registry altitude figures.

Non-TOU gas conversion was checked for a sample of two ICPs, and I confirmed that the altitude factors were correctly calculated and applied.

2.2 Metering Set-up Information

Trustpower compares their metering fields against registry metering fields on a daily basis.

Meter pressure

Meter pressure is a field in GTV. The recorded meter pressure value is used in the pressure factor calculation for all invoices and reconciliation submissions created after the date and time GTV pressure is updated.

Where a pressure change occurs without a physical meter change, or a correction is required from a certain date, GTV requires that the “reverse and rebill” process occurs to ensure the change is from the correct date.

There were 21 meter pressure changes from 01/01/18 until the 29/02/20. In all cases the effective date for the meter pressure change was the date GTV was updated. The changes were not made back to the correct effective date. In total there were 2,530 days where the meter pressure was incorrect. 1,554 of those days were for one ICP. Ten of the changes were due to correction of meter pressure by the meter owner, leading to a change in GTV. 11 of the changes were due to Trustpower originally loading zero kPa for a new connection or a meter change and then correcting this after validation found a discrepancy. This matter is discussed further in Section 3.5, where a breach is alleged.

Meter numbers and digits

The meter reading processes are designed to identify meter number or digit discrepancies.

The meter number is stored in the hand-held device. If the meter reader’s hand-held device is expecting more digits than the number of dials, then the reading is entered as normal and notification is made in the “readers notes” field for investigation. If the hand-held is expecting fewer digits than

the number of dials, then the reading is entered into the “readers notes” field and once again an investigation is conducted. This “safety net” appears to be robust and meter dials are checked against the registry on a daily basis.

Meter multipliers

This field is included in the registry validation checks. There are currently no meters with multipliers.

Meter types and content codes

All TOU ICPs have the correct register content codes recorded.

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) Gas temperature records for the GMS location under flowing conditions. Historic records can be used if similarity is preserved.
- (b) Records of actual gas temperature in similar installations at similar locations over corresponding periods.
- (c) For compact installations directly connected to short risers and well shaded from direct sunlight, 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.
- (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. The installation should be shielded from direct sunlight.

Trustpower has chosen option (c) and records an average daily temperature for each month. They apply the daily weighted average temperature for the period which consumption is being calculated for. Option (c) seems to be the most logical choice because it matches the majority of GMS installations.

From May 2020 Trustpower has applied the ground temperatures published on the GIC’s website for all allocated gas gates. I checked an extract from GTV to ensure all temperatures matched.

The previous audit report recorded that the temperature data for Gisborne (GIS07810) was too low, because the data for Motu had been used and Motu has a colder climate than Gisborne. The temperature data was updated at the time of the previous audit, but it appears the temperature used were too high. The table below shows that the percentage variance for January is greater than that allowed by NZS 5259:2015.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
NIWA data	21.4	20.9	19.2	15.7	12	9.7	8.7	9.7	11.8	15	17.6	20
Trus data	24.8	23.8	21.1	17.2	13.3	10.7	9.1	10.6	13	16.5	19.3	22.5
NIWA factor	0.97827194	0.97993539	0.9856337	0.997577	1.010521	1.018738	1.022352	1.018738	1.01123	1	0.991058	0.982944
TRUS factor	0.96710858	0.97036538	0.9792693	0.992423	1.005935	1.015149	1.020903	1.015507	1.006989	0.994821	0.985297	0.974632
% variance	1.14%	0.98%	0.65%	0.52%	0.45%	0.35%	0.14%	0.32%	0.42%	0.52%	0.58%	0.85%

Non-Conformance	Description	Audited party comment
<p>Regarding: Rule 26.5.4</p> <p>Control Rating: Effective</p>	<p>Temperature information was incorrect for the Gisborne (GIS07810) gas gate, leading to a conversion error of 1.14%. Temperature data is now sourced from the GIC's website; therefore, the controls are now effective, and the matter is resolved for future submissions.</p>	<p>Response: Trustpower accepts this breach</p> <p>Comments: We will continue to review the effectiveness of this control.</p>

NZS 5259:2015 states that correction for temperature drop due to Joule-Thomson effect of pressure reduction is applicable if temperature methodologies (b), (c) or (d) are used, provided the reduction is made in the same installation and immediately upstream of the GMS. "In other cases, or for large pressure drops or high flow rates the actual temperature drop should be measured. For natural gas the temperature drop is about 0.5° per 100kPa of pressure drop." This indicates that adjustment for the Joule-Thomson effect is desirable.

The Billing Factors Guideline contains the following expectations by GIC:

- include an assessment of the Joule-Thomson effect if there is a significant pressure reduction before gas enters the meter; the pressure reduction can be assessed as the difference between network pressure in the registry and the meter pressure.

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

The accuracy of the Joule-Thomson adjustment is dependent on correct inputs, including network pressure and gas gate.

Trustpower applies the Joule-Thomson effect adjustment and the formula was checked and confirmed correct.

Network pressure

Trustpower validates network pressure against the registry as part of their ongoing checks.

Gas gate

Trustpower validates the gas gate against the registry as part of their ongoing checks.

2.3.2 Calorific Values

Open Access Transmission Information System (OATIS) gas composition data is imported into GTV daily.

The accuracy of the Orion information was confirmed by comparing an OATIS file with the contents of GTV for May 2020.

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 Trustpower securely archives data for a period in excess of 30 months.

Some data provided by Trustpower's meter reading contractor was checked, and it was found that the readings matched the data in GTV. This proves the end-to-end process.

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

This rule requires that for consumer installations where the actual or expected consumption is greater than 10TJ, a TOU meter will be installed and the installation will be assigned to allocation group 1 or 2. For consumer installations where the actual or expected consumption is between 250GJ and 10TJ a non-TOU meter will be installed and the installation will be assigned to allocation group 4. Other installations should be assigned to allocation group 6.

All ACTC and ACTV ICPs had a value recorded in their allocation group on the registry. I checked the discrepancy reporting for allocation groups, and it appears there is validation in place to ensure ICPs are changed to AG6 from AG4, but not from AG6 to AG4. I requested an extract of all ICPs with annual consumption to check the accuracy of allocation groups. I found 56 AG4 ICPs with consumption lower than 250GJ and 32 AG6 ICPs with consumption of 250GJ or more. I recommend the reporting is improved to ensure allocation groups are corrected as soon as practicable.

Recommendation	Audited party comment
Improve reporting and controls to ensure allocation groups are corrected as soon as practicable.	Response: Trustpower accepts this recommendation Comments: Reporting and education/socialisation of requirements has been strengthened.

Non-Conformance	Description	Audited party comment
<p>Regarding: Rules 29.2 & 29.3</p> <p>Control Rating: Adequate</p>	88 ICPs have the incorrect allocation group.	<p>Response: Trustpower accepts this breach</p> <p>Comments: A recent internal change in team structures and in roles & responsibilities led to an incorrect report (control) being used.</p> <p>The incorrect allocation groups have all been updated and the correct report is now being used.</p>

There is no impact on meter reading frequency, because Trustpower reads all ICPs monthly.

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

Each month, retailers must report the number and percentage of validated meter readings obtained in accordance with rules 29.4.3 and 29.5 in the GAS080 report.

All consumer installations with non-TOU meters must have validated register readings recorded at least once every 12 months unless exceptional circumstances prevent such an interrogation. 90% of consumer installations with non-TOU meters must have a validated reading every four months.

All ICPs are on monthly meter reading rounds. If a reading is not obtained within 150 days, an outbound call is made by the billing team. If a reading is still not obtained at the 6-month point, the meter reading team take over responsibility and a letter is sent. If this is unsuccessful then the “compliance read” process commences. This process is where MRS is given responsibility to get a reading within 10 days and they must make five attempts, including at least one site visit and one after hours call. I consider this process achieves compliance with the “best endeavours” requirement.

To confirm compliance with the meter reading frequency rules, Trustpower provided a copy of the GAS080 report for December 2019 to February 2020.

Target	Rolling 4 months (target 90%)	12 months (target 100%)
Dec 2019	98.38%	99.98%
Jan 2020	98.79%	99.96%
Feb 2020	98.65%	99.98%

I checked the records for 14 ICPs not read at 12 months from the February 2020 report. In all cases, exceptional circumstances were present, and several attempts had been made to obtain meter readings.

Trustpower has sound processes in place to add, change or remove ICPs in meter reading rounds.

3.4 Non TOU Validation

Meter reading validation occurs at multiple levels.

At source, the handheld data input devices perform a localised validation, to ensure that the reading is within expected high-low parameters. These parameters are set as a “high/low” limit, based on an agreed setting with Trustpower.

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

The next two levels of validation occur in GTV, pre-billing and post billing. This validation includes the following checks:

- high consumption,
- no consumption,
- no reading,
- consumption on vacant connected ICPs,
- consumption on disconnected ICPs,
- credit reads (reading lower than the previous reading or estimate),
- minimum and maximum number of days,
- ICPs not on a meter reading schedule,
- ICPs with no registers, and
- multiple reads available.

Each register that fails validation is manually checked. If it is decided that the reading may be incorrect then billing is delayed, and a check reading is performed. Readings are not edited as part of this process.

The “zero consumption” reporting is not currently as effective as it could be. It contains approx. 3,000 records, but there is no ability to filter the report to exclude vacant or to note that zero consumption is expected due to the seasonality of the load.

Recommendation	Audited party comment
<p>Improve “zero consumption” reporting to enable filtering of records to exclude records where the zero consumption is likely to be correct. Build in the capability to “flag” records that have previously been confirmed as “false positives”.</p>	<p>Response: Trustpower accepts this recommendation</p> <p>Comments: We will prioritise the additional capability needed to strengthen this control.</p>

3.5 Non TOU Error Correction

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

Stopped or faulty meters

Where a meter is found to have stopped, an estimated removal reading is entered which adds the estimated unrecorded volume to the removal reading recorded on the meter. This process results in consumption information appearing in the relevant revision files. I checked three examples; two were resolved correctly and one is still in progress, awaiting meter test results.

Meter pressure corrections

As recorded in **section 2.2**, when meter pressure corrections are made, the corrected value only starts from the date of the correction. No historic corrections are made. There were 21 meter pressure changes from 01/01/18 until the 29/02/20. In all cases the effective date for the meter pressure change was the date GTV was updated. The changes were not made back to the correct effective date. In total there were 2,530 days where the meter pressure was incorrect. 1,554 of those days were for one ICP. Ten of the changes were due to correction of meter pressure by the meter owner, leading to a change in GTV. 11 of the changes were due to Trustpower originally loading zero kPa for a new connection or a meter change and then correcting this after validation found a discrepancy.

Non-Conformance	Description	Audited party comment
<p>Regarding: Rules 26.2.1 & 26.3</p> <p>Control Rating: Not adequate</p>	<p>Meter pressure corrections were not backdated to the correct start date for 21 ICPs.</p>	<p>Response: Trustpower accepts this breach</p> <p>Comments: Reporting and education/socialisation of requirements has been strengthened.</p> <p>Of these 21 ICP's, eight can be rebilled as they fit within the 12-month cut-off date for wash ups. These will be rebilled before the August Wash up. The remaining 13 ICPs are not able to correct via GTV, due to wash ups already being done.</p> <p>There were five ICP's where the differences were a negative or more than 4.5. Trustpower will investigate a way of manually calculating the price differences and ensuring customers and networks are not disadvantaged by the error. The remaining eight ICPS were too old to rebill and all were a pressure difference of less than 2.5 and had been incorrect less than a month so the difference is very small.</p>

Inactive status corrections

Consumption is reported for all ICPs which have a metered status. Trustpower provided 15 examples of ICPs with inactive consumption, and I confirmed that consumption during the inactive period was correctly reported.

3.6 TOU Validation

Trustpower supplies one AG1 ICP and eight AG2 ICPs. TOU downloads are conducted by Electrix and Powerco.

TOU calculations are conducted in an excel spreadsheet and a peer review is conducted for each ICP to ensure the inputs are correct. Consumption patterns and overruns are checked as a potential indicator of unexpected consumption patterns.

I checked the spreadsheets for two ICPs where estimations had occurred, which were subsequently replaced with actuals. The information appears to be correct.

4. Energy Consumption Calculation (Rule 28.2)

To evaluate energy consumption calculations, a spreadsheet was prepared which converts volume between meter readings to volume at standard conditions and then to energy consumption. The relevant information for some TOU and non TOU ICPs was entered into the spreadsheet and the resulting energy value was compared to that calculated by GTV. This comparison confirmed the accuracy of the GTV calculation and confirmed compliance with NZS 5259:2015.

TOU Energy Consumption Calculation

Raw TOU data is converted to energy within an Excel spreadsheet. All ICPs have TG register content codes (temperature and gauge pressure corrected), therefore I checked and confirmed that altitude adjustment occurs. I also checked the Joule Thomson and compressibility calculations. The conversion process matched for both examples checked.

Non TOU Energy Consumption Calculation

Testing confirmed that GTV is calculating pressure, altitude and temperature factors correctly for non TOU ICPs.

I checked the non TOU conversion process by reperforming the conversion process for a sample of two ICPs with different meter pressures, network pressures, gas gates, and altitudes. I also checked the Joule Thomson and compressibility calculations. The conversion process matched for both examples checked.

5. Estimation and Submission Information

5.1 TOU Estimation and Correction (Rule 30.3)

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

Various methods are used depending on the nature of the issue. If data is missing and a register reading is available, then a profile is created by using a similar previous period. The customer may be consulted if the profile is unclear. If data and register readings are missing then consumption history, recent usage patterns and consultation with the customer are used to determine a likely profile and usage.

Two temporary and five permanent estimates were examined, and I conclude Trustpower's processes achieve compliance with the requirement to provide its "best estimate of consumption information" for all ICPs. In all cases, historic data was used for the estimate, and discussions occurred with the account manager and the customer to ensure the estimates matched the expected profile.

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.

GAS040 non TOU energy submissions

Trustpower validates non TOU consumption at gas gate and ICP level prior to submission, including the following checks:

- comparison to the previous month,
- comparison to the previous revision, and
- checks of all ICPs where the difference in consumption between the previous and current months is greater than 50 GJ.

I confirmed that Trustpower's consumption information provided to the allocation agent is calculated at ICP level and then aggregated.

As mentioned in **section 2.1.1**, when there is a delay in populating the registry for new connections, the consumption information is not always included for the initial allocation. I checked five ICPs where the registry update was backdated. The table below shows the results.

ICP	Event date	Claim date	Date of first submission
1001298582NG0F5	14/01/2020	10/02/2020	Interim submission for Jan 20
1000587564PG58B	22/01/2020	20/02/2020	Interim submission for Jan 20
1000587770PG42B	11/12/2019	24/02/2020	Interim submission for Dec 19 and Jan 20
1000587655PGD35	12/12/2019	2/03/2020	Interim submission for Dec 19 and Jan 20
1000587769PG0D7	12/12/2019	4/03/2020	Interim submission for Dec 19 and Jan 20

Non-Conformance	Description	Audited party comment
<p>Regarding: Rules 26.2.1 & 28.3</p> <p>Control Rating: Adequate</p>	Consumption information not submitted for the initial allocation for at least five ICPs.	<p>Response: This breach falls outside of our control as the retailer.</p> <p>Comments:</p> <ul style="list-style-type: none"> •It is not until TRUS receive an application that we know to complete a registration and set up the ICP in GTV. •For 4 of these ICP's the network had another retailer populated as the expected retailer so TRUS did not have any initial visibility over the applications. •For 1 ICP the network delayed updating the details to the Registry which means that we were unaware of the application.

Vacant ICPs

The matter of “vacant consumption” was also examined. When an ICP is vacant but still active (ACTV on the registry), meter reading still occurs and any volume that is recorded is converted into validated consumption and is then included in the allocation process. A sample of active vacant ICPs were reviewed and found to be correctly included in the GAS040 submissions.

GAS050 TOU energy submissions

As mentioned in **sections 3.6** and **5.1**, TOU information is managed in a spreadsheet and GAS050 files are manually created. My manual checks confirmed accuracy from raw meter data through to reconciliation files.

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.

Trustpower did not meet this requirement for some gas gates during the 12-month period shown. The results are summarised in the table below.

Month	Total Gas Gates	Number Within 10%	% Compliant	Within $\pm 10\%$ or < 200 GJ	% Compliant or immaterial
Jan-18	66	14	21%	56	85%
Feb-18	66	42	67%	66	100%
Mar-18	66	47	71%	66	100%
Apr-18	66	16	24%	57	86%
May-18	66	8	12%	51	77%
Jun-18	66	10	15%	50	65%
Jul-18	67	40	60%	64	96%
Aug-18	67	53	79%	67	100%
Sep-18	68	22	32%	56	82%
Oct-18	68	11	16%	54	79%
Nov-18	68	11	16%	57	84%
Dec-18	68	13	19%	56	82%

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

Month	Initial Submission All Gas Gates (GJ)	Final Submission All Gas Gates (GJ)	Percentage Variation
Jan-18	46,523	39,696	17%
Feb-18	40,073	39,532	1%
Mar-18	47,554	48,714	-2%
Apr-18	55,750	66,620	-16%
May-18	77,745	97,753	-20%
Jun-18	107,521	130,807	-18%
Jul-18	130,916	133,941	-2%
Aug-18	122,331	120,251	2%

Month	Initial Submission All Gas Gates (GJ)	Final Submission All Gas Gates (GJ)	Percentage Variation
Sep-18	109,895	98,776	11%
Oct-18	91,234	75,480	21%
Nov-18	74,285	64,075	16%
Dec-18	58,853	47,702	23%

The tables above show that the consumption information submitted to the allocation agent for the initial submission was sometimes over-estimated and at other times under-estimated. Analysis of seven gas gates with large differences found that there were no additional issues present.

Non-Conformance	Description	Audited party comment
<p>Regarding: Rule 37.2</p> <p>Control Rating: Effective</p>	<p>The initial submission accuracy did not meet the required accuracy percentage for some gas gates for the period January 2018 to December 2018.</p>	<p>Response: See below</p> <p>Comments:</p> <ul style="list-style-type: none"> We looked at differences over 200GJ and 10% - the majority are immaterial at ICP level. small differences across many sites push the gate total over the threshold. The rest are Commercial sites. some of which have such sporadic consumption. We believe that an ICP level there is no materiality and therefore we believe our current processes are appropriate.

5.4 Forward Estimates (Rules 34 & 36)

The rules do not prescribe how forward estimates are to be calculated.

The forward estimate methodology is as follows:

- consumption from the same period one year earlier, scaled up using the previous months volume and then adjusted by profile shape data,
- if a read was not conducted in the previous year then the last read period will be used, and
- where no reading history is available then a daily average figure is used from the GTN file for a switch in or manually entered for new connections.

Where profile shape data is not available then the average of the read to read period is used.

5.5 Historic Estimates (Rules 34 & 35)

Historic estimates are calculated within GTV using validated readings, permanent estimate readings, conversion factors, and seasonal adjusted shape values.

Seasonal Adjusted Daily Shape Values (SADSV) are downloaded from the allocation portal when allocation results are published and are uploaded directly into GTV.

To assist with determining compliance of the historic estimate processes, Trustpower was supplied with a list of scenarios. For each scenario, a manual calculation was performed using the relevant seasonal adjustment shape file, and this was compared to the calculation performed in Trustpower's system. This test also proves that the correct shape file is used in each case. Compliance is confirmed for all historic estimate 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.	Correct
b	ICP becomes Inactive part way through a month.	Consumption is only calculated for the Active portion of the month.	Correct
c	ICP's become Inactive then Active within a month.	Consumption is only calculated for the Active portion of the month.	Correct
d	ICP switches in part way through a month on an estimated switch event reading	Consumption is calculated to include the 1st day of responsibility.	Correct
e	ICP switches out part way through a month on an estimated switch event reading.	Consumption is calculated to include the last day of responsibility.	Correct
f	ICP switches out then back in within a month	Consumption is calculated for each day of responsibility.	Correct
g	Continuous ICP with a read during the month	Consumption is calculated assuming the readings are valid until the end of the day	Correct
h	Continuous ICP without a read during the month	Consumption is calculated assuming the readings are valid until the end of the day	Correct
i	Rollover Reads	Consumption is calculated correctly in the instance of meter rollovers.	Correct

Test	Scenario	Test expectation	Result
j	ICP has a multiplier or fixed factor (if any)	Consumption is calculated including the multiplier or fixed factor.	No examples available

5.6 Proportion of Historic Estimates (Rule 40.1)

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

5.7 Billed vs Consumption Comparison (Rule 52)

GAS070 reports are generated using invoice information calculated by GTV. Invoice data is included in the GAS070 if the billing period end date occurs within the period being reported.

The content of the GAS070 files was proved by selecting three gas gates and checking the invoice data for all ICPs connected to the gas gate against the GAS070 file for January 2020. This confirmed the accuracy of the data, and all the invoices included had invoice dates within January 2020.

Year ending	Annual Billed GJ	Annual Consumption GJ	GJ difference	Percentage Difference
Jan-2019	1,010,062.81	1,012,167.66	-2,104.84	-0.21%
Jan-2020	972,893.77	985,782.48	-12,888.71	-1.31%

Five gas gates were analysed where there were differences between annual billed GJ and annual consumption. There were no issues identified.

5.8 Gas Trading Notifications (Rule 39)

A retailer must give notice to the Allocation Agent where they commence or cease to supply gas under a supplementary agreement to a transmission services agreement, or amend information required to be provided under the supplementary agreement under rule 39.2.

Trustpower confirmed that processes exist to ensure that the trading team informs the reconciliation team where there are changes to supplementary agreements for allocated gas gates. There are currently no supplementary agreements in place for any allocated gas gates.

6. Recommendations

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

- Improve reporting and controls to ensure allocation groups are corrected as soon as practicable.
- Improve “zero consumption” reporting to enable filtering of records to exclude records where the zero consumption is likely to be correct. Build in the capability to “flag” records that have previously been confirmed as “false positives”.

Appendix 1 – Control Rating Definitions

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

Appendix 2 – Trustpower Comments

We would like to thank the auditors for their thorough approach.

The process has highlighted some areas where controls could be strengthened – we are committed to doing this before the end of 2020.