VERITEK

Gas Downstream Reconciliation Performance Audit Final Report

For

Trust Power Limited

Prepared by Steve Woods – Veritek Ltd

Date of Audit: 21/04/14 & 19/05/14

Date Audit Report Complete: 24/09/14

Executive Summary

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

The purpose of this audit is to assess the systems, processes and performance of 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 GIC in June 2013.

The summary of report findings in the table below shows that Trustpower's control environment is effective for eight of the fifteen areas evaluated and adequate for three areas. The control environment is not adequate for four areas.

Ten of the fifteen areas evaluated were found to be compliant. Eight breach allegations are made in relation to the remaining areas. They are summarised as follows:

1. Consumption information not provided to the allocation agent for one "new connection" ICP.

2. Altitude figures are incorrect for two ICPs leading to consumption information being over recorded by approx. 4%.

3. 480 meter pressure discrepancies leading to incorrect consumption information.

4. Incorrect consumption information was submitted to the allocation agent for the initial allocation due to genuine zeros being replaced with a default value.

5. The Incorrect number of installations is recorded in the GAS040 file due to system counting some ICPs which have switched out or become inactive.

6. 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.

7. Historic estimate apportionment between months is incorrect because the first day for any new ICP (switched in or activated) is not accounted for.

8. The seasonal adjustment shape file was not loaded and used for April 2014; therefore apportionment between months was incorrect.

As a result of this performance audit I recommend the following:

- Validation processes are required for the accuracy of registry and metering information.
- Where meter pressure discrepancies exist, the correct pressure should be confirmed by examining meter dockets or by conducting field visits.
- Monitoring is required at a high level to ensure the accuracy and compliance of information provided to the allocation agent.
- Forward estimate accuracy is not adequate and I recommend the use of a different estimation methodology to reduce the reliance on the annual consumption data from the previous retailer.
- Several system and process changes are required in order to achieve full compliance. I recommend appropriate priority, resource and expertise is applied to the resolution of these matters.
- Joule Thompson adjustment does not occur. I recommend Trustpower considers adjusting for the Joule Thompson effect once network pressure is confirmed as correct, in line with the GIC recommendations.

Summary of Report Findings

Issue	Section	Control Rating (Refer to Appendix 1 for definitions)	Compliance Rating	Comments
ICP set up information	2.1	Not adequate	Not compliant (2 breach allegations)	Registry population and validation processes are not fully established. The new connections process was not developed at the time of the audit. Some incorrect altitude figures used.
Metering set up information	2.2	Not adequate	Not compliant (1 breach allegation)	Meter pressure validation processes did not exist and 480 meter pressure discrepancies were found. The meter pressure had been rounded to one decimal place for 428 ICPs.
Billing factors	2.3	Effective	Compliant	Robust controls are in place to ensure the correct temperature and CV data is used.
Archiving of reading data	3.1	Effective	Compliant	The security and archiving practices are effective and compliant.
Meter interrogation requirements	3.2	Adequate	Compliant	Regular reporting is required to ensure ongoing compliance.
Meter reading requirements	3.3	Effective	Compliant	Trustpower has a well-developed and robust meter reading capability.
Non TOU validation	3.4	Effective	Compliant	Trustpower's validation processes are effective and compliant.

Non TOU error correction	3.5	Effective	Compliant	Trustpower's correction processes ensure revised consumption information flows through to the correct revision files.
TOU validation	3.6	N/A	N/A	
Energy consumption calculation	4	Effective	Compliant	The calculation is operating as expected
TOU estimation and correction	5.1	N/A	N/A	
Provision of retailer consumption information	5.2	Adequate	Not compliant (2 breach allegations)	Incorrect consumption information submitted to the allocation agent for the initial allocation due to genuine zeros being replaced with a default value. Incorrect number of installations recorded in the GAS040 file due to system counting some ICPs which have switched out or become inactive.
Initial submission accuracy	5.3	Not adequate	Compliant	Trustpower is unlikely to achieve compliance with rule 37.2 when the final allocations are conducted due to the heavy reliance on the annual consumption figure from the previous retailer's GTN file.
Forward estimates	5.4	Not adequate	Not compliant (1 breach allegation)	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.

Historic estimates	5.5	Adequate	Not compliant (2 breach allegations)	Historic estimate apportionment between months is incorrect because the first day for any new ICP (switched in or activated) is not accounted for. The seasonal adjustment shape file was not loaded and used for April 2014; therefore apportionment between months was incorrect.
Proportion of HE	5.6	Effective	Compliant	This information is accurately recorded.
Billed vs consumption comparison	5.7	Effective	Compliant	The files contain the correct information.

Persons Involved in This Audit

Auditor:

Steve Woods
Veritek Limited

Trustpower personnel assisting in this audit were.

Name	Title
Stuart Milsom	Service Delivery Manager (Metering)
Cushla Dyer	Metering Services Team Leader
Frans Paulussen	Reconciliation Graduate Analyst
Denyse Cambie	Compliance and Assurance Advisor

Trustpower has their own meter reading capability and no agents are used for any processes.

Contents

1. Pre-Audit and Operational Infrastructure Information

1.1 Scope of Audit

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

65. Industry body to commission performance audits

65.1 The industry body must arrange at regular intervals performance audits of the allocation agent and allocation participants.

65.2 The purpose of a performance audit under this rule is to assess in relation to the allocation agent or an allocation participant, as the case may be, -

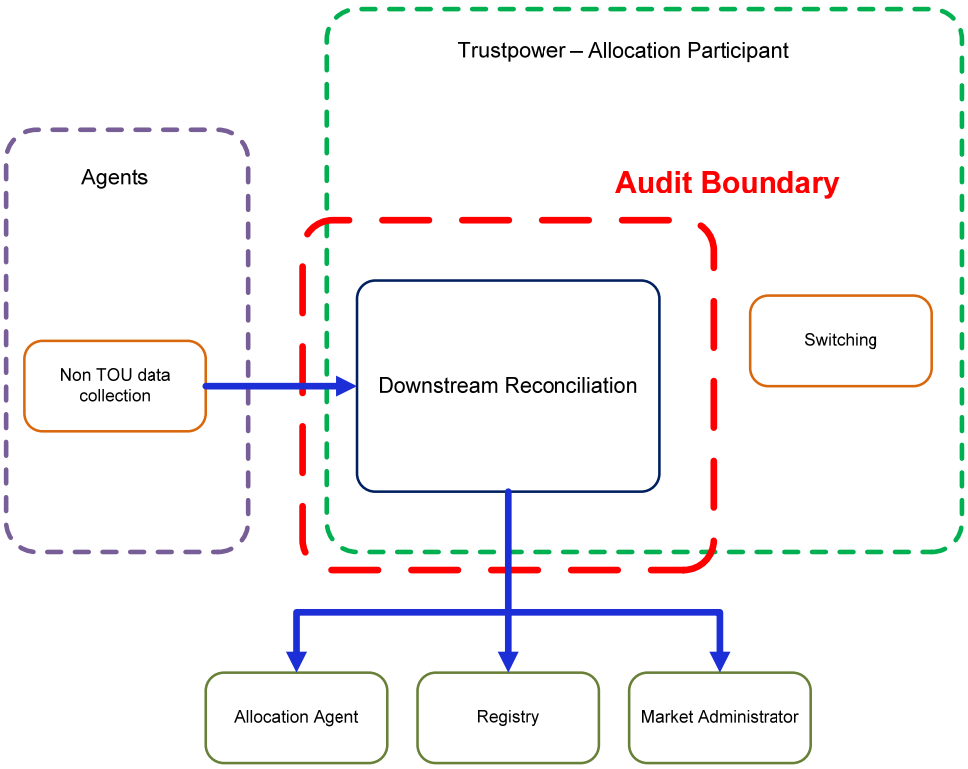
65.2.1 The performance of the allocation agent or that allocation participant in terms of compliance with these rules; and

65.2.2 The systems and processes of the allocation agent or that allocation participant that have been put in place to enable compliance with these rules..

The audit was conducted in accordance with terms of reference prepared by 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 May 19th-21st 2014 at Trustpower's offices in Tauranga.

The scope of the audit includes "downstream reconciliation" only, as shown in the diagram below. Switching, metering ownership and data collection functions are not within the audit scope. Trustpower only has allocation group 6 ICPs, therefore they do not have any TOU processes or systems.



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]

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-compliance has been evaluated.

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

1.3 General Compliance

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

Trustpower has one alleged breach recorded by the Market Administrator since November 2013. This breach related to switching, which is not within the scope of this audit.

Nature of Breach	Rule	Quantity	Section in this Report
Switching Breaches	N/A	1	N/A

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

Breach Allegation	Rules	Section in this report
Consumption information not provided to the allocation agent for one "new connection" ICP	28.3	2.1.1
Altitude figures are incorrect for two ICPs leading to consumption information being over recorded by approx. 4%	28.2	2.1.2
480 meter pressure discrepancies leading to incorrect consumption information	28.2, 26.2.1	2.2
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	5.2
Incorrect number of installations recorded in the GAS040 file due to system counting some ICPs which have switched out or become inactive.	31.3, 32.3, 33.3	5.2
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	5.4
Historic estimate apportionment between months is incorrect because the first day for any new ICP (switched in or activated) is not accounted for.	35.1,35.2	5.5
The seasonal adjustment shape file was not loaded and used for April 2014; therefore apportionment between months was incorrect.	35.3	5.5

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.

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

1.5 Draft Audit Report Comments

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

Party	Response	Comments provided	Attached as appendix
Trustpower	Yes	Yes	Yes
Contact Energy	Yes	Yes	Yes

The comments received were considered in accordance with rule 71.1, prior to preparing the final audit report. The following changes were made to the report after considering comments:

- In Section 2.2, I have removed reference to GasNet meter pressure discrepancies; these were confirmed as correct in Trustpower's and GasNet's systems. I have also removed the reference to the difficulty in obtaining some meter dockets. All information was eventually available to enable analysis to be conducted.
- In Section 2.3.1, I have changed the recommendation that Trustpower considers adjusting for the Joule Thomson effect, to "I recommend Trustpower considers adjusting for the Joule Thompson effect once network pressure is confirmed as correct."

1.6 Transmission Methodology and Audit Trails (Rule 28.4.1)

A complete audit trail was viewed for all data gathering, validation and processing functions. This rule requires that "The consumption information supplied to the allocation agent in accordance with rules 29 to 40 is transferred in such a manner that it cannot be altered without leaving a detailed audit trail..." All meter reading data is transmitted to Trustpower in a secure manner through their SevenX meter reading system. 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 5259:2004, for metering equipment installed at each consumer installation, for which the retailer is the responsible retailer.

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

2.1 ICP Set Up Information

2.1.1 New Connections Process

The process was examined for the connection and activation of new ICPs. Trustpower has not yet established processes to validate the data in Gentrack Velocity (GTV) against the registry. The validation reports have been identified and documented but are yet to be worked on.

I obtained a report from Trustpower with data from GTV and compared this to 2,985 records in a list file. The table below shows the results.

Data	Percentage Incorrect	Quantity Incorrect	Comments
Gas gate	0.00%	0	
Altitude	3.70%	2	Sample size of 54
Meter owner	0.00%	0	
Meter serial number	1.01%	30	
Meter pressure	16.08%	480	
Meter dials	1.21%	37	
Meter multiplier	0.00%	0	
Status	2.5%	73	

Trustpower does not have the capability to conduct new connections and did not intend to do so; however one new connection has been in progress since March 7th 2014 and cannot be set up in GTV because the capability does not yet exist. Submission of consumption information is therefore not occurring as required by rule 28.3 for this ICP. This matter was resolved by the date of the draft audit report.

I checked the event detail report for March 2014 to evaluate whether status information is being populated in a timely manner. 25 ICPs had their status changed to ACTC. The registry was updated more than five business days after the actual event date for 21 of the 25 ICPs, and for 16 of these the

registry was updated more than 20 business days after the actual event date. 22 of the changes were from ACTV to ACTC following a switch move. One new connection was recorded and the registry was updated within 6 business days. If ICPs have the incorrect status of ACTV for a period of several weeks, meter reading still occurs and the consumption information is supplied to the allocation agent. I checked some examples to ensure the consumption information flowed through to the GAS040 file.

Eight ICPs were changed to ACTV during the same period, and none of these had a registry update duration of more than eight business days.

2.1.2 Altitude Information

It is a distributor responsibility to populate the registry with current and accurate altitude information and Trustpower uses these figures.

NZS 5259:2004 Amendment No1 contains the following points, which affect the way altitude information should be managed:

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

Trustpower provided a registry list file and a random sample of ICPs per distributor was 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". The requirement in point 1 above was not met for two ICPs on the NGCD network but was met for 52 other ICPs I examined. 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, 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 appears to be reasonably accurate. UNLG has two ICPs where the altitude figure differs by more than 20m and NGCD has two ICPs different by more than 90m, as recorded above.

Distributor	Total ICPs	ICPs checked	Quantity within 20m
UNLG	57	12	10
NGCD	3,059	20	18
POCO	801	12	12
GNET	10	10	10
Total	**3,927**	**54**	**50**

A further evaluation was conducted of ICPs where the altitude figure was zero on the registry. There were only two ICPs with zero and they are the two on UNLG with differences of more than 20m.

I have considered whether distributors have potentially breached any rules by populating the registry with inaccurate altitude information. Distributors have responsibility for populating the registry with altitude figures[2] and for maintaining the accuracy of this information. Nevertheless, rule 28.2 requires retailers to comply with NZS 5259:2004, which includes the altitude accuracy requirements mentioned above. Therefore I conclude that Trustpower has not complied with rule 28.2.

2.2 Metering Set-up Information

Meter pressure is taken from the GTN at the time ICPs switch in but it is not validated against meter owner data. During the initial audit, I recommended this validation be conducted on a monthly basis. During the initial audit, I also recorded that meter pressure figures were rounded to one decimal place. Although the result of the rounding does not lead to a conversion error greater than that allowed by Table 3 of NZS5259, I strongly recommended this matter be resolved to ensure compliance with rule 26.2.1, which is the requirement to provide accurate and complete information. The meter pressure field now has 2 decimal places and the records for ICPs which had switched in prior to the change in decimals have been corrected.

I compared meter dials, multipliers and meter pressure data from GTV with data supplied by meter owners and the table below shows the results.

428 of the meter pressure discrepancies are due to the rounding issue. The discrepancy for 14 ICPs will result in an error greater than ± 1.1% which is outside the maximum permitted error in NZS 5259.

Trustpower has conducted some analysis of the discrepancies and has found the following:

- One of the three Powerco discrepancies was due to an incorrect figure in a switch file. This has been corrected. One ICP has switched out and Trustpower has notified the gaining retailer. The third ICP has had the meter removed.
- 20 NGCM meter dockets were obtained, confirming that Trustpower's meter pressure was incorrect for 17 ICPs and NGCM's data was incorrect for three ICPs.

[2] Gas (Switching Arrangements) Rules 2008, Part A, ICP parameters maintained by Distributors and rules 41 and 58.

If meter dockets cannot be obtained, I recommend field visits are conducted to confirm the correct meter pressure before changes are made.

Meter Owner	Total ICPs	Meter Pressure Discrepancies	Meter Dial Discrepancies
NGC	2,722	475	35
Powerco	243	3	2
Gas Net	9	2	0
Nova	3	0	0
Total Discrepancies		**480**	**37**

Where meter dial discrepancies exist there does not appear to have been an effect on consumption information. The meter reading processes are designed to identify meter dial discrepancies that could affect meter reading accuracy. If the meter reader's hand held device is expecting more digits than the number of dials, then the reading is entered as normal and notification is made in the "readers notes" field for investigation. If the hand held is expecting fewer digits than the number of dials, then the reading is entered into the "readers notes" field and once again an investigation is conducted. Although this "safety net" appears to be robust, I recommend that meter dials validation be conducted on a monthly basis with meter owners.

2.3 Billing Factors

2.3.1 Temperature Information

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

(a) Temperature records of the station under flowing conditions. Historical records can be used if similarity is preserved.

(b) Records of actual gas temperature in similar installations over similar periods at similar locations may serve to estimate the value of gas temperature in the installation.

(c) For compact installations directly connected to short risers and well shaded from direct sunlight, where the temperature of the gas is in the vicinity of ground temperature, the temperature may be estimated from the average ground temperature at 300mm depth. NOTE – Reliable and relevant climatic temperature data may be used as a basis for estimating average 300mm ground temperatures. This may include published data. For

installations with seasonal use only, the data for the relevant season or seasons should be used.

(d) For installations where the inlet pipes are exposed to ambient air conditions the temperature may be estimated from the mean temperature obtained at reliable and relevant weather recording stations. For installations with seasonal use only, the data for the relevant season or season should be used. The installation should be shielded from direct sunlight.

Trustpower has chosen option (c) and uses a read to read daily average temperature in their calculations. The daily temperature data was sourced from NIWA in 2013 and contains daily average ground temperatures at a 300mm depth.

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

A number of parties have questioned the accuracy of network pressure and GIC's guideline note regarding Joule Thomson contains the following statement *"Network owners ensure nominal operating pressures are correctly populated in the registry for all ICPs on their networks."*

Given the uncertainty regarding the accuracy of network pressure, I recommend Trustpower considers adjusting for the Joule Thompson effect once network pressure is confirmed as correct. Trustpower has asked Gentrack for a proposal to make the necessary system changes to enable Joule Thomson adjustment in line with my recommendation.

2.3.2 Calorific Values

Gas composition is sourced from the Open Access Transmission Information System (OATIS) and is loaded into GTV each day by the billing team. GTV will estimate the CV if data is missing but 70% of the values for a read to read period are present.

As part of the energy consumption calculation testing I confirmed the correct CV is being used.

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.

Some data provided by Trustpower's meter reading contractor was checked and I found 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.

During the initial audit, I recommended Trustpower develop a reporting and monitoring capability to identify ICPs with actual consumption above 250GJ, and if it is determined the consumption is likely to remain at this level the allocation group be changed from 6 to 4. Trustpower has not yet developed this capability and I recommend they do. A one off report was run which contained ten ICPs where the annual consumption reported by the previous retailer was greater than 250GJ. Trustpower evaluated the actual consumption based on meter readings and it appears these ICPs are unlikely to consume more than 250GJ per annum.

The list file contained seven allocation group 4 ICPs. Six of these have been changed back to allocation group 6 due to the annual consumption reported by the previous retailer being less than 250GJ. One ICP remains as allocation group 4 and is on a monthly read cycle as required by rule 29.4.2.

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. Validated meter readings must be obtained every four months for 90% of consumer installations with non-TOU meters.

Trustpower provided a copy of the GAS080 reports for April and May 2014 and the 90% threshold was met for both months, as shown in the table below. Trustpower has not been operating for 12 months yet, so compliance with rule 29.4.3 is not yet relevant.

The table below shows the GAS080 results.

Target	Month	Reading Percentage (GAS080)
Rolling 4 months (target 90%)	April 2014	100.00%
	May 2014	99.71%

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

Non TOU validation occurs at multiple levels and has the same settings used for electricity.

Firstly, at the handheld level where a localised validation will occur to ensure the reading is within expected high/low parameters. The parameters are set at 150% and 50% and changing of these parameters requires management sign off.

Readings that fail this validation are required to be re-entered, and if the two readings are the same, the second reading will be accepted. If the second reading is different, (potentially indicating the first reading was incorrect) then the second reading is required to be re-entered.

If data becomes corrupted, including dates and times, SevenX will not allow this to be uploaded and an investigation will then occur.

Meter serial numbers are provided to meter readers and can be viewed in their hand held devices. This assists with ensuring that meter readings relate to the correct meter.

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 ICPs
- Credit reads (reading lower than the previous reading or estimate)
- Minimum and Maximum number of days
- ICPs not on a meter reading schedule
- 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.

3.5 Non TOU Error Correction

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

Changes to consumption information can occur if changes have been made to billing information. In these situations, Trustpower adopts a “reverse and rebill” process to correct billing and therefore consumption information. This process was examined and as long as the “reverse and rebill” process is used, consumption information for prior consumption periods is included in the revision process and provided to the allocation agent. In situations where consumption will not be billed to a consumer, GTV has a field for “adjustment consumption” (ADJ). The correct consumption is calculated and recorded on a “Revenue Assurance Case Summary” worksheet, then entered into the ADJ field, where it automatically flows through to submission and revision files. I checked a worksheet for a correction but there were no examples for gas where the ADJ field had been populated. I checked

several examples for electricity, which uses the same process, and confirmed the consumption information was included in the revision files.

3.6 TOU Validation

Trustpower does not have any TOU customers.

4. Energy Consumption Calculation (Rule 28.2)

To evaluate this calculation a spreadsheet was prepared which converts volume between meter readings to volume at standard conditions and then to energy consumption. The relevant information for an ICP was entered into the spreadsheet and the resulting energy value was compared to that calculated by Trustpower. This comparison confirmed the accuracy of the GTV calculation and confirmed compliance with NZS 5259.

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

5. Estimation and Submission Information

5.1 TOU Estimation and Correction (Rule 30.3)

Trustpower does not have any TOU customers.

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 April 2014 was examined and compared to the data in Trustpower's system at ICP level; the totals matched, which confirms compliance. This also proves that Trustpower's consumption information provided to the allocation agent is calculated at ICP level and then aggregated.

The matter of "vacant consumption" was 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, even though this consumption is not billed.

During Trustpower's initial audit, I noted that if a status was recorded incorrectly, it was possible to have consumption for a status that was not included in the GAS040 file. I recommended Trustpower report monthly on consumption for statuses not included in the GAS040 calculation. This matter has been resolved by changing the query for the preparation of the GAS040 file to include all statuses. I checked the details of the query confirm this.

Trustpower uses an access database to create submission files. This process includes a step where if consumption is considered to be "missing", it can be "plugged" with a manually set number of GJ. The actual figure used varied, but there were a number of examples where 1GJ was used for periods where data was "missing" for genuine reasons, for example vacant or inactive ICPs. This matter is resolved from a consumption perspective; all "plugs" are now zero and the revision files are "washing out" the previous incorrect values. Whilst the interim submission files contain correct consumption information, the initial files contained incorrect information and were therefore not compliant with rule 26.2.1, which is the requirement to provide accurate and complete information.

Two matters are still outstanding. When a "plug" of zero occurs, the GAS040 file still counts the ICP as an installation, even though it may have switched out or become inactive. Some ICPs are considered "held" in GTV after they have switched out, so zeros are submitted in the GAS040 but as mentioned earlier, they are counted as installations. This does not achieve compliance with rules 31.3, 32.3 and 33.3. The other issue is that the first day for any new ICP (switched in or activated) is not accounted for. This affects forward default estimates (one day is missing) and historic estimate apportionment between months because the calculation does not consider the first day in the first month. These matters are discussed further in sections 5.4 and 5.5.

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 is 10%. Trustpower has not submitted information for any final allocations and has only submitted information for interim allocation for November 2013, December 2013 and January 2014. The table below shows that the 10% threshold was not met for most gas gates. Trustpower is unlikely to achieve compliance when the final submissions are conducted.

Month	Total Gas Gates	Number Within 10%	% Within 10%
November 2013	21	1	4.76%
December 2013	28	5	17.86%
January 2014	35	5	14.29%

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

Month	Initial Submission All Gas Gates (GJ)	Interim Submission All Gas Gates (GJ)	Percentage Variation
November 2013	48.103	57.215	15.93%
December 2013	597.392	384.002	55.47%
January 2014	1,829.296	1,239.506	47.58%

The tables above show that the consumption information submitted to the allocation agent for the initial submission was considerably higher than the information for the interim submission. This is mainly due to the high proportion of forward estimates and the fact they are based on the annual consumption figure from the previous retailer's GTN file. These figures will include winter and summer consumption and Trustpower is gaining new customers in the summer period.

5.4 Forward Estimates (Rules 34 & 36)

Trustpower's forward estimate methodology is based on the following:

- Consumption from the same period one year earlier, adjusted by profile shape data (note that as the consumption may have changed over the one year period, another date range is compared and the most suitable one used).
- If a read was not conducted in the previous year then the last read period will be used.
- 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.

Trustpower has not been operating for long enough to have consumption information from one year earlier so most forward estimates are based on the figure in GTN files or the previous read period. The lack of history and the use of estimated annual consumption information from GTN files has led to significant variation between initial and interim submissions.

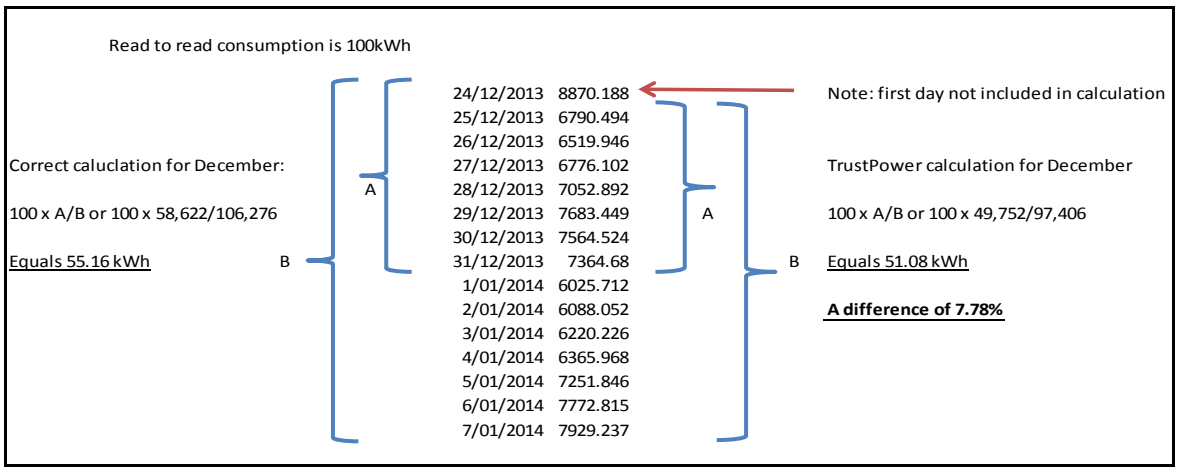
As mentioned in Section 5.2, the first day for any new ICP (switched in or activated) is not accounted for. This means one day is missing from forward default estimates. Rule 36.2 allows the retailer to determine the method used for calculating a forward estimate at its discretion; however I consider compliance has not been achieved with rule 26.2.1, which is the requirement to provide accurate and complete information.

5.5 Historic Estimates (Rules 34 & 35)

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.

Test	Scenario	Test Expectation	Result
A	ICPs become inactive part way through a month.	Consumption is only calculated for the Active portion of the month.	Compliant
B	ICPs become active then inactive within a month.	Consumption is only calculated for the Active portion of the month.	Compliant
C	ICPs become inactive, then active, then inactive again within a month.	Consumption is only calculated for the Active portion of the month.	Compliant
D	ICPs start on the 1st day of a month.	Consumption is calculated to include the 1st day of responsibility.	Not compliant
E	ICPs end on the last day of the month.	Consumption is calculated to include the last day of responsibility.	Compliant
F	ICPs start part way through a month.	Consumption is calculated to include the 1st day of responsibility.	Not compliant
G	ICPs end part way through a month.	Consumption is calculated to include the last day of responsibility.	Compliant
H	ICP's are lost and won back in a month.	Consumption is calculated for each day of responsibility.	No examples found
I	ICPs start on 1st and end on last day of month.	Consumption is calculated for each day of responsibility.	No examples found
J	Rollover reads	Consumption is calculated correctly in the instance of meter rollovers.	No examples found

The calculation is not compliant for scenarios D and F. As mentioned in Section 5.2, the first day for any new ICP (switched in or activated) is not accounted for. This means the total consumption is correct but is apportioned between the months incorrectly. The example below using a sample scenario, illustrates that the proportion of consumption allocated to December is incorrect by 7.78%. This will not be corrected during the revision process unless the calculation method is changed. I've shown the example in kWh rather than GJ to assist with readability. Compliance has not been achieved with rules 35.1 and 35.2.



I checked the process for ensuring the correct seasonal adjustment shape files were used and found that the April 2014 shape file had not been loaded, although it was available. This step is now included on the list of monthly tasks, but there will be some historic estimates calculated without adjustment. Compliance has not been achieved with rule 35.3.

5.6 Proportion of Historic Estimates (Rule 40.1)

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

5.7 Billed vs Consumption Comparison (Rule 52)

The content of the GAS070 files was proved by selecting some gas gates and checking the bills in GTV for all ICPs at those gates, against the total in the GAS070 files. This confirmed the accuracy of the data. I compared the billed quantities against the most recent GAS040 quantities for the period November 2013 to April 2014 and the submitted total is less than the billed total by 9.4%. I've used a one month offset because a proportion of the billed quantities relate to the previous month. Whilst this percentage is high, I do not consider a valid comparison can be made until at least one year's worth of data is available.

6. Recommendations

As a result of this performance audit I recommend the following:

- Validation processes are required for the accuracy of registry and metering information.
- Where meter pressure discrepancies exist, the correct pressure should be confirmed by examining meter dockets or by conducting field visits.
- Monitoring is required at a high level to ensure the accuracy and compliance of information provided to the allocation agent.
- Forward estimate accuracy is not adequate and I recommend the use of a different estimation methodology to reduce the reliance on the annual consumption data from the previous retailer.
- Several system and process changes are required in order to achieve full compliance. I recommend appropriate priority, resource and expertise is applied to the resolution of these matters.
- Joule Thompson adjustment does not occur. I recommend Trustpower considers adjusting for the Joule Thompson effect, once network pressure is confirmed as correct, in line with the GIC recommendations.

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 – Contact Energy Comments

Contact wishes to comment as follows:

The audit report states that "As a result of the performance audit I recommend the following: Joule Thompson adjustment does not occur. I recommend Trustpower considers adjusting for the Joule Thompson effect, in line with the GIC recommendations."

There are two points to note:

- Clause 2.7.4.3 of NZS 5259 does not require application of the Joule-Thomson effect for a participant to be compliant. It states "…..correction **may** be made…..". Contact considers it should be left to individual participants whether or not they apply adjustment for temperature drop due to the Joule-Thomson effect, and it should not be recommended in performance audit reports.
- On several occasions Contact has indicated to Gas Industry Co and auditors that until distributors confirm that the network pressure populated in the registry accurately reflects the nominal operating pressure in the section of the network supplying each ICP, it would be inappropriate for a participant to apply (or an auditor to recommend application of) an adjustment for temperature drop due to the Joule-Thomson effect. On 8/8/14 Powerco confirmed in an email what we have been saying for several years. It states "Historically Powerco's network pressures at the Gas Registry have been restricted to an individual number and this has been nominated as the supply pressure provided at the relative gas gate." Powerco is now correcting the position and we note that this is resulting in material changes to the network pressure in the registry for all Contact ICPs including adding the pressure for several thousand ICPs that had no network pressure in the registry. Had any participant been using the existing network pressure the pressure drop used for adjustment for the Joule-Thomson effect would have been materially inaccurate. While we applaud Powerco for addressing the anomalies we would want confirmation from the other distributors of their policy for populating network pressure before we would consider application of Joule-Thomson effect.

Appendix 3 – Trustpower Comments

Better together.

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12/09/2014

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

Dear Steve

Trustpower Downstream Reconciliation Performance Draft Audit Report

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

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

Issue	Comment	Action
Consumption information not provided to the allocation agent for one "new connection" ICP.	Trustpower has been developing its Gas New Connection process. At the time of audit our policy was, we were not taking any New Connections due to this development. However a commitment made by one of our team to a customer meant we had an obligation to process an ICP which slipped through. Consumption information has been provided since to the allocation agent through revision files.	A Gas New Connection process now exists; 3 more ICPs have successfully been processed. There is additional work underway to improve and automate this process further.
Altitude figures are incorrect for two ICPs leading to consumption information being over recorded by approx. 4%.	Altitude figures are loaded into GTV using registry information. This field is controlled by the Distributor.	Distributor has agreed the altitude figures were incorrect, they will make registry change overnight.
480 meter pressure discrepancies leading to incorrect consumption information.	Design issue identified where our system was rounding inherent Meter Pressure values from GTN files to 1 decimal place.	Our system now accepts 2 decimal places. The 480 Meter Pressure discrepancies identified in audit are now corrected. Monthly report created to compare Meter Pressure in GTV to amount provided in Meter Owner files.

Issue	Comment	Action
Incorrect consumption information was submitted to the allocation agent for the initial allocation due to genuine zeros being replaced with a default value.	We have addressed this issue in a project. It is now resolved. All consumption information will be corrected in revision files.	Default value now zero. System changes are now resulting in fewer default value instances used.
The Incorrect number of installations is recorded in the GAS040 file due to system counting some ICPs which have switched out or become inactive.	We have addressed this issue in a recent project. All consumption information will be corrected in revision files.	GAS040 file now generated directly from our system rather than manually prepared via the preparation query.
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.	This was a design issue and we have addressed this issue in a recent project. All consumption information will be corrected in revision files.	This fix is now in place.
Historic estimate apportionment between months is incorrect because the first day for any new ICP (switched in or activated) is not accounted for.	We have addressed this issue in a project. All consumption information will be corrected in revision files.	This fix is now in place.
The seasonal adjustment shape file was not loaded and used for April 2014; therefore apportionment between months was incorrect.	Due to change in resource this was missed. April shape file has since been loaded. We have submitted the correct consumption to the allocation agent in the April revision file.	The process of loading shape files is now checked as part of monthly tasks. System will also use daily average data if no shape file is available.

Trustpower has also considered your recommendation on including Joule Thompson adjustments. This adjustment was excluded from the original project scope because of concerns relating to the accuracy of industry data. Based on more recent discussions we have decided to modify our system, albeit some of our data accuracy concerns remain. The Joule Thompson adjustment change has been included in a project with expected deliver by end of September 2014.

We are happy for you to quote any of our comments in your Final Report.
If you have any questions, or require further information, please contact me at (021) 653 627 or richard.barnett@trustpower.co.nz

Kind regards

Richard Barnett
Manager Group Risk