Gas Downstream Reconciliation Performance Audit Final Report

For

Nova Energy Limited

Prepared by Steve Woods – Veritek Ltd

Date of Audit: 17/03/11 to 31/03/11

Date Audit Report Complete: 25/07/11

Executive Summary

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

The purpose of this audit is to assess the systems, processes and performance of Nova Energy in terms of compliance with these rules.

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

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

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

- An altitude factor of "1" is used for all ICPs. This does not achieve compliance for approximately 4,850 ICPs
- The use of incorrect meter pressure information has led to the submission of incorrect consumption information to the allocation agent for 1,143 ICPs.
- There are approximately 1,700 ICPs with incorrect allocation group recorded in the registry.
- Estimated TOU consumption information has been submitted to the allocation agent on a number of occasions from October 2008 to January 2011. Nova Energy's processes achieve compliance with the requirement to provide its "best estimate of consumption information"; however, the existence of estimated information is considered a matter of non-compliance. Some estimated data is not correctly identified.
- The initial submission accuracy did not meet the required accuracy percentage for every gas gates for the period October 2008 to January 2011.

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

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

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

Summary of Report Findings

Issue	Section	Control Rating (Refer to Appendix 1 for definitions)	Compliance Rating	Comments
ICP set up information	2.1	Adequate	Not compliant	Some ACTV ICPs should be recorded at ACTC. Some time delays exist with the registry update systems and processes. Some ICPs have an incorrect ACTC date. An altitude factor of "1" is used for all ICPs. This does not achieve compliance for approximately 4,850 ICPs.
Metering set up information	2.2	Adequate	Not compliant	Some meter pressure and meter dial discrepancies exist between Nova Energy's and meter owners' records. I recommend that Nova Energy check the meter dockets for a further 400 ICPs to determine the extent of the inaccuracy of meter owners' records.
Billing factors	2.3	Effective	Compliant	A minor recommendation is made in relation to the monitoring of the CV population process.
Archiving of reading data	3.1	Effective	Compliant	A minor recommendation is made in relation to the security of meter reading files during transmission.

Meter interrogation requirements	3.2	Adequate	Not compliant	There are approximately 1,700 ICPs with an incorrect allocation group recorded in the registry.
Meter reading requirements	3.3	Effective	Compliant	Meter reading attainment processes are robust. A minor recommendation is made in relation to the accuracy of the GAS080 reports.
Non TOU validation	3.4	Effective	Compliant	A robust validation process is in place before and after invoicing.
Non TOU error correction	3.5	Effective	Compliant	Corrected data automatically flows through to the relevant revision files.
TOU validation	3.6	Adequate	Compliant	Register readings are not used for validation for approx 15 ICPs. Event log and alarm log reporting is not reviewed as part of the validation process. It is recommended that this is included as a validation step. Data for two ICPs passed validation, although inaccuracies were subsequently discovered.
Energy consumption calculation	4	Effective	Compliant	There is no manual intervention in this process, and it was “proved” from end to end using a spreadsheet based calculation tool.

TOU estimation and correction	5.1	Adequate	Not compliant	Nova Energy's processes achieve compliance with the requirement to provide its "best estimate of consumption information". The existence of any estimated TOU consumption information is considered a matter of non-compliance. This issue is addressed on a monthly basis and breach allegations are in existence in all cases. Some estimated data is not correctly identified in situations where an invoice has already been produced prior to the estimation being conducted. Some of the supporting information for estimates and corrections was difficult to locate. I recommend improvements to the journaling and archiving of supporting information to ensure a more effective audit trail is in existence.
Provision of retailer consumption information	5.2	Adequate	Compliant	The process for preparing consumption information files is compliant; however, some meter pressure and meter dial discrepancies exist between Nova Energy's and meter owners' records. This has resulted in the submission of incorrect consumption information to the allocation agent.
Initial submission accuracy	5.3	Effective	Not compliant	Nova Energy 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	Nova Energy 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	Adequate	Compliant	Some variances exist between billed and consumption information. Although these figures cannot be directly compared, they provide a useful indicator to ensure that under reporting of consumption information is not occurring.

Persons Involved in This Audit

Auditor:

Steve Woods
Veritek Limited

Nova Energy personnel assisting in this audit were.

Name	Title
Colin Leslie	Retail Services Manager
Charles Tiechert	Manager
Chris Power	Manager
Natasha Dauphin	Operations Manager
Abdul Osman	Metering and Billing Team Leader
Neill Deppe	Energy Analyst
Nick Mustard	Energy Analyst
Tony Button	Accounts Administrator
Tawhai Twomey	Switching and metering coordinator
Lauren Sinkinson	Switching and metering coordinator

Service providers assisting with processes within the audit scope:

Company	Processes
Meter Reading Services Limited	Gathering and storing raw meter data
Wells Instrument & Electrical Services Ltd	Gathering and storing raw meter data and TOU downloads
Vector Limited	TOU downloads
PowerCo	TOU downloads

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1. Pre-Audit and Operational Infrastructure Information

1.1 Scope of Audit

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

65. Industry body to commission performance audits

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

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

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

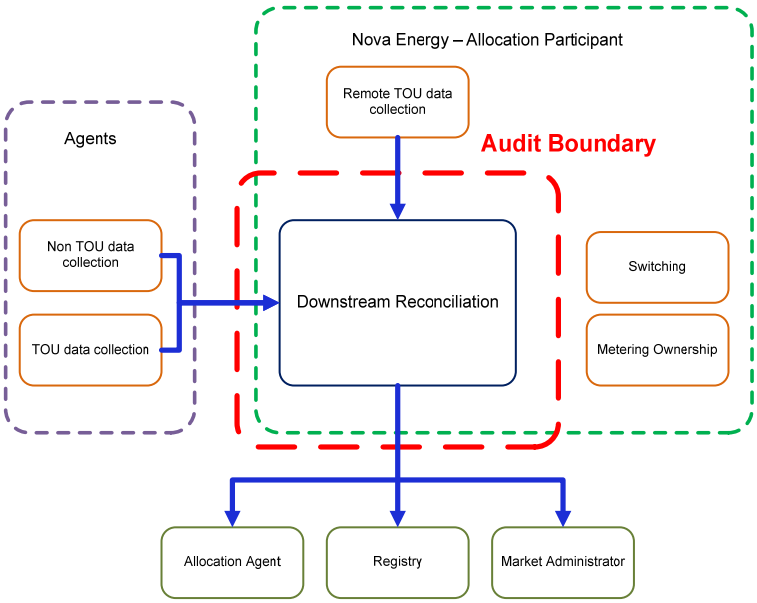
65.2.2 The systems and processes of the allocation agent or that allocation participant that have been put in place to enable compliance with these rules.

The audit was conducted in accordance with terms of reference prepared by the GIC, and in accordance with the "Guideline note for rules 65 to 75 and 80: the commissioning and carrying out of performance audits and event audits, V2.0" which was published by the GIC in October 2010. The scope of the audit includes Nova Energy's three retailer codes, GNVG, AGCL and BOPE. Unless these codes are specifically mentioned in the report, any mention to Nova Energy relates to all three retailer codes.

The locations and dates the audit was carried out were as follows:

- Auckland – March 17th
- Wellington – March 21st and 22nd
- Whakatane – March 31st

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



1.2 Audit Approach

As mentioned in Section 1.1 the purpose of this audit is to assess the performance of Nova Energy 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 Nova Energy 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 Nova Energy'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 Nova Energy's first performance audit under rule 65; therefore, there is not a previous audit report for review.

An event audit was conducted in 2009 for the Greater Auckland and Tawa A gas gates. The relevant finding of these audits, which has been further examined during this performance audit, is that consumption information for six ICPs was not included in the file submitted to the allocation agent.

Nova Energy has 136 alleged breaches recorded by the Market Administrator since October 2008. They are summarised as follows:

Nature of Breach	Rule	GNVG Quantity	AGCL Quantity	BOPE Quantity	Section in this Report
Switching Breaches		31	21	21	Not within audit scope
Submission of estimated TOU data	31, 32 & 33	55			5.1
Initial vs final allocation variances more than 15 %	37.2	16	16	16	5.3
Incorrect submission information	26	3	1		2.2
Late historical estimate information	40.1			1	5.6
Late trading notification	39.2	7	4	1	
Late GAS070 information	52	2			5.7
Late meter reading reports	40.2		1	2	3.3
Provision of consumption information	31, 32 & 33	1	2	2	
Payment of fees	18	1			
Exemptions	19	1			
Transitional information	78	2			

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

Breach Allegation	Rule	Section in this report
An altitude factor of "1" is used for all ICPs. This does not achieve compliance for approximately 4,850 ICPs.	26.2.1, & 28.2	2.1.2
The use of incorrect meter pressure information has led to the submission of incorrect consumption information to the allocation agent for 1,143 ICPs.	26.2.1, & 28.2	2.2, & 5.2
There are approximately 1,700 ICPs with the incorrect allocation group recorded in the registry.	29	3.2
Estimated TOU consumption information has been provided on a number of occasions. Nova Energy's processes achieve compliance with the requirement to provide its "best estimate of consumption information"; however, the existence of estimated information is considered a matter of non-compliance. This issue is addressed on a monthly basis. Some estimated data is not correctly identified.	30.3	5.1
The initial submission accuracy did not meet the required accuracy percentage for every gas gates for the period October 2008 to January 2011.	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 Nova Energy, the allocation agent and any allocation participant.

The provision of supporting information or the results of analysis was delayed in some cases during the audit due to other priorities.

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
Contact Energy	Yes	Yes	No

The comments received were considered in accordance with rule 71.1, prior to preparing the final audit report. As a result, I have made some changes to Section 2.2 to clarify the effect of meter pressure discrepancies on consumption information and to Section 5.7 to clarify the relationship between billed and consumption information.

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..." Compliance is confirmed with this rule in relation to consumption information supplied to the allocation agent; however, in situations where consumption information is replaced, the original file is not retained. This matter was examined in relation to the initial submission for July 2010. The original file was found to be inaccurate and was replaced. The inaccuracy was due to incorrect conversion factors, incorrect reads and incorrect profile data. The replacement file was checked by comparing a selection of ICPs in the file that supports the GAS040 file against invoices in Orion. The replacement file was found to be correct for the sample checked; however, the original file at ICP level was not retained. Although I do not consider this a breach of the rules, because the file was not used by the allocation agent, I recommend that all versions of files are retained for audit trail purposes.

The audit trail for TOU corrections and estimations was also examined. The supporting information for this activity is kept in various locations and was difficult to find during the audit. I recommend that a journal is kept in Orion that contains summary information and also a reference to the location of additional information, which should be kept in a central directory.

Some data collection agents provide data via FTP. The rest of the data is "text" files sent as email attachments. This method is not considered secure and it is recommended that these files be zipped with password protection to ensure their security during transmission.

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

Every retailer must ensure the conversion of measured volume to volume at standard conditions and the conversion of volume at standard conditions to energy complies with NZS 5259:2004, for metering equipment installed at each consumer installation, for which the retailer is the responsible retailer.

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

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

2.1 ICP Set Up Information

2.1.1 New Connections Process

The process was examined for the connection and activation of new ICPs. On a periodic basis, there is a check between the registry and Orion that includes the following:

- Active ICPs on the registry without a record in the submission file
- ICPs in the submission file but not active on the registry
- Allocation group discrepancies
- Gas gate discrepancies
- Vacant on the registry with consumption recorded in Orion

The check of ICPs in the submission file but not active on the registry, recently resulted in 1,001 status changes from ACTV to ACTC. 450 of these were "backdated" by more than 12 months. I checked the "ICP level" files that support the submission files to confirm that consumption information was provided to the allocation agent for all of these ICPs.

The list files for all retailer codes were examined and there were 240 ICPs with a status of ACTV. All ACTV ICPs remain in the meter reading cycle and all consumption information is included in submission files to the allocation agent. A check of a sample of ACTV ICPs showed that many had customers registered and therefore should have had a status of ACTC. Whilst there is no impact on the accuracy of consumption information, there would be an effect on the winning retailer if any of these ICPs switched out. BOPE advised that their old system (NCS) did not have a process to update from ACTV to ACTC during switching, as Orion now has. I recommend that Nova Energy checks all ICPs at ACTV and updates the registry to ACTC for all ICPs with a customer recorded.

The event detail reports for all retailer codes were checked and it was found that 22 GNVG ICPs and 9 BOPE ICPs had their status changed to ACTC during the period December 6th to December 17th 2010.

For GNVG the registry was updated more than five business days after the actual event date for 17 of the 22 ICPs, and for 8 of these the registry was updated more than 20 business days after the actual event date. For BOPE the registry was updated more than five business days after the actual event date for all 9 ICPs, and for 3 of these the registry was updated more than 20 business days after the actual event date.

The average days from the actual event date to until the registry was updated was 24 days for GNVG and 102 days for BOPE. The higher average for BOPE is due to three ICPs where the registry was updated more than 250 days after the connection date. These ICPs were discovered by checking ICPs that were "unclaimed" on the registry. These issues also related to a period when connection and metering notification to BOPE occurred at the end of the new connections process. BOPE has recently changed their new connections process and they now receive notification from distributors as soon as an ICP is created. This enables BOPE to monitor pending new connections to ensure none become connected without notification. ICP "set-up" in Orion does not occur until connection and metering information is received, so the monitoring still has a manual component.

When an ICP is established in Orion for a GNVG or AGCL ICP for a proposed new connection, a "proposed connection date" field is populated. Monitoring is in place to identify those ICPs where this date has passed without the receipt of a livening notification. There is also monitoring of situations where a livening notification has been provided but a meter docket has not been received. Customer information is provided by the distributor at the time the ICP is first established for the proposed new connection. This process includes appropriate steps to minimise the late notification to the registry and to ensure consumption information is provided to the allocation agent at the earliest opportunity.

In most cases, consumption information will not be provided to the allocation agent until the registry is updated, which means that for a large proportion of ICPs where the status has change to ACTC, consumption information will not be provided to the allocation agent for the initial allocation. In some instances, for the BOPE retailer code, the status was active in Orion but the registry status was incorrect. In these cases, consumption information was provided to the allocation agent. In all cases, consumption information was apportioned into the correct months in the most recent revision file.

I compared the registry notification dates to connection and metering paperwork for a small selection of BOPE ICPs. Often the connection date provided by the distributor is before the metering installation date by several days. The date provided by the distributor is used as the ACTC date; however, gas cannot be consumed until a meter is installed. The more recent of the two dates should be used as the ACTC date.

2.1.2 Altitude Information

It is the distributors' responsibility to populate the registry with altitude information; however, Nova Energy does not use these figures. An altitude factor of "1" is used for all ICPs (i.e. 0m above sea level).

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

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

The use of an altitude figure of "1" does not achieve compliance with the requirement of point one above, for approximately 4,850 ICPs. Total consumption information is likely to be over reported by approximately 0.5%.

2.2 Metering Set-up Information

Nova Energy has conducted some analysis of meter pressure discrepancies for all gas gates and identified 819 ICPs where the meter pressure did not match that provided by the meter owner.

I also compared the meter pressure recorded by Nova Energy against information provided by meter owners. This analysis showed 1,143 meter pressure discrepancies. I have provided Nova Energy with a list of 324 ICPs for further analysis, which were in the list of 1,143 but were not included in their list of 819.

The discrepancies identified are shown in the table below.

Meter Owner	Total ICPs	Meter Pressure Discrepancies	Meter Dial Discrepancies
NGC	5,761	375	300
Powerco	5,192	328	63
Gas Net	250	38	0
Contact	18,211	402	209
Total Discrepancies		**1,143**	**572**

Under submission has occurred for 590 ICPs and over submission has occurred for 553 ICPs. The table below shows the approximate effect on the accuracy of consumption information.

Percentage Error	Number of ICPs Where Over Submission has Occurred	Number of ICPs Where Under Submission has Occurred
0 to 5%	493	498
5 to 10%	8	13
Greater than 10%	52	79
Total	**553**	**590**

Meter dockets, or other records, were requested from meter owners to confirm the accuracy of their data for a sample of 129 discrepancies. This analysis showed that the meter pressure information originally supplied by the meter owner was incorrect for nine ICPs. A summary of this analysis is shown below.

Meter owner	Discrepancies Evaluated	Meter Owner Data Incorrect
NGC	26	7
Powerco	17	2
Gas Net	38	0
Contact	48	0
Totals	**129**	**9**

I consider that this sample size is sufficient to draw the conclusion that retailers cannot rely on the meter pressure data in meter owner's databases to correct their databases, without further supporting information from either meter dockets or site visits. I recommend that Nova Energy check the meter dockets for a further 400 potential discrepancies to determine the extent of the inaccuracy of meter owners' records.

The invoices for a sample of some ICPs were checked where meter dial discrepancies exist and there does not appear to have been an effect on consumption information. The meter reading processes are designed to identify meter dial discrepancies that could affect meter reading accuracy. If the meter reader's hand held device is expecting more digits than the number of dials, then the reading is entered as normal and notification is made in the "readers notes" field for investigation. If the hand held is expecting fewer digits than the number of dials, then the reading is entered into the "readers notes" field and once again an investigation is conducted. This "safety net" appears to be robust; however, the quantity of meter dial discrepancies existing within the industry suggests that this validation process may not always be applied. I recommend that meter dials validation be conducted on a monthly basis with meter owners. I also recommend that the GIC consider whether it is more appropriate for this information to be contained on the registry.

I recommend that meter owners be required to undergo performance audits to ensure the processes for recording and reporting metering set-up information are robust.

The use of incorrect meter pressure information has led to the submission of incorrect consumption information to the allocation agent. I allege a breach of rules 26.2.1 & 28.2.

2.3 Billing Factors

2.3.1 Temperature Information

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

(a) Temperature records of the station under flowing conditions. Historical records can be used if similarity is preserved.
(b) Records of actual gas temperature in similar installations over similar periods at similar locations may serve to estimate the value of gas temperature in the installation.
(c) For compact installations directly connected to short risers and well shaded from direct sunlight, where the temperature of the gas is in the vicinity of ground temperature, the temperature may be estimated from the average ground temperature at 300mm depth. NOTE – Reliable and relevant climatic temperature data may be used as a basis for estimating average 300mm ground temperatures. This may include published data. For installations with seasonal use only, the data for the relevant season or seasons should be used.
(d) For installations where the inlet pipes are exposed to ambient air conditions the temperature may be estimated from the mean temperature obtained at reliable and relevant weather recording stations. For installations with seasonal use only, the data for the relevant season or season should be used. The installation should be shielded from direct sunlight.

Nova Energy has chosen option (c) and they apply the daily weighted average temperature for the billing/read-read period. Option (c) seems to be the most logical choice because it matches the majority of GMS installations. Nova Energy has advised that the source of the data is a file from NIWA, although it is unclear what date this data was provided. The temperature data for gas gates HTV11301 and ALF15501 was compared to data recently provided by NIWA and the figures used by Nova Energy appear to be approximately 1.5ºc to 2.0ºc lower. This could result in consumption information for ICPs at these gas gates being calculated high by approximately 0.5%.

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

NZS 5259:2004 states "...correction may be made for the temperature drop due to pressure reduction if this reduction is made in the same installation and immediately upstream of the GMS. The temperature drop is about 0.5º per 100kPa of pressure drop. For large pressure drops or high flow rates it is recommended that the actual temperature drop be measured." This indicates that adjustment for the Joule Thompson effect is desirable. Nova Energy applies the Joule Thompson effect adjustment and the formula was checked and confirmed correct.

2.3.2 Calorific Values

Gas composition data is sourced from the Open Access Transmission Information System (OATIS) and is loaded into Orion. Each day is originally populated with a default figure of "41", which is replaced by the actual figures from OATIS. The accuracy of the Orion information was checked by comparing an OATIS file with the contents of Orion for March 2010. It was found that the data for the most recent day had not been populated into Orion and the default figure of 41 was being used. The error from this omission did not exceed the allowable margin of ± 0.5% as noted in NZS5259:2004, however I recommend that Nova Energy considers implementing monitoring or reporting of CV population to ensure ongoing accuracy.

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

Some data provided by Nova Energy's meter reading contractor was checked and it was found that the readings matched the data in Orion. This proves the end-to-end process. As mentioned in section 1.6, not all meter-reading files are transferred in a secure manner. A recommendation is made in relation to this.

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.

Nova Energy conducts analysis of consumption on a periodic basis to ensure ICPs are in the correct allocation groups. The most recent analysis found the following:

- 681 GNVG or AGCL allocation group 6 ICPs with allocation group 4 recorded in Orion
- 612 GNVG or AGCL allocation group 4 ICPs with allocation group 6 recorded in Orion
- 180 BOPE allocation group 6 ICPs with allocation group 4 recorded in Orion
- 33 BOPE allocation group 4 ICPs with allocation group 6 recorded in Orion
- 3 ex EGas ICPs are recorded at allocation group 2 in Orion but are allocation group 4 on the registry. 2 of the 3 do not have TOU metering installed.

The data in Orion has been updated for the GNVG and AGCL ICPs, but the BOPE changes have not been made. The registry was updated in March 2011 for the GNVG and AGCL discrepancies.

Approximately 1,300 of the 1,700 registry changes required related to ex EGas ICPs and 400 related to historic Nova Energy ICPs. The use of incorrect allocation groups is alleged as a breach of rules 29.1 to 29.3.

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.

Nova Energy provided a copy of the GAS080 reports for February 2011. These are summarised below.

Target	**Reading Percentage (GAS080)**		
	AGCL	**GNVG**	**BOPE**
Rolling 4 months (target 90%)	96.26	99.29	99.49
12 months (target 100%)	97.11	99.21	99.90

A closer examination of the supporting data found that these percentages understate Nova Energy's actual performance. Nova Energy re-ran their reporting and this summary is contained in the table below. I recommend that Nova Energy examine the process for preparing the GAS080 reports to ensure ongoing accuracy.

Target	**Reading Percentage (re-run reporting)**		
	AGCL	**GNVG**	**BOPE**
Rolling 4 months (target 90%)	99.95	94.44	99.17
12 months (target 100%)	100.00	100.00	99.95

There is only one ICP across all retailer codes that has not been read for 12 months. BOPE has attempted to gain access on several occasions and I consider that exceptional circumstances exist.

Nova Energy has not always 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. There are three breach allegations recorded in Section 1.3 in relation to these instances.

All ICPs are read monthly and various methods are employed to obtain readings in instances where a reading is not obtained on the first attempt. Estimation processes are used as a last resort. All commercial ICPs are read as close as possible to the end of the month. Nova Energy's meter reading processes appear robust and reduce the reliance on forward estimates to ensure submission accuracy.

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 Nova Energy.

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

The second level of validation occurs when the data reaches Nova Energy. This validation includes the following checks:

- Meter not found for a premise
- High reading
- Low reading
- Meter reading already present in the system
- Another reading exists for the same day
- Meter could not be read
- Meter reading date is earlier than existing billed reads

Readings that fail validation are manually investigated and any issues resolved.

Readings are then subject to "billing validation". Each bill produced is subject to a number of individual validation checks. Bills that fail validation end up on an "exceptions" list and any issues are investigated and resolved prior to sending the bill. These validation checks include:

- High dollar amount
- Negative dollar amount
- Long billing days
- Short billing days
- High percentage variation from previous bill

- Electricity consumption without gas consumption

Meter readings are not edited during this process. If a reading fails validation and an incorrect meter reading is suspected then a check reading will be performed.

3.5 Non TOU Error Correction

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

Sometimes errors can be corrected by "scaling" in situations where an incorrect multiplier or factor was used. In other cases, the error correction involves estimation, for example if a meter is stopped.

Error correction was examined by a "walk through" of the process and by examining some specific examples. It was confirmed that the correction process results in consumption information being allocated to the correct months and being submitted to the allocation agent in the correct revision file. This includes situations when new ICPs are notified after the initial submission for any particular month.

The meter pressure for the 819 ICPs mentioned in Section 2.2 has been corrected. The meter pressure field in Orion does not have a start/end date for an existing record. Therefore, when changes to pressure are made the submission data is automatically updated through a recalculation process.

3.6 TOU Validation

Nova Energy's TOU data is collected manually. When the Master Link system is used these files are imported in to Master Link and then loaded into an Access based system called Intellex. Files that are collected by different systems are loaded directly into Intellex.

A check of clock time occurs in the field and is checked as part of the periodic accuracy checks. Event log and alarm log reporting is not reviewed as part of the validation process. It is recommended that this is included as a validation step.

Once the files have all been converted to the same format the Operations Engineer and the Account Managers review each ICP in a graphical format to identify any anomalies.

There is an additional volume check against the volume derived from meter register readings. There are approximately 15 ICPs where the register readings are not available. I recommend that these readings are sought and used in the validation process.

There has been consistently high negative UFG at the Edgecombe gas gate (EGC30701). Nova Energy is the retailer for two ICPs (approximately 90% of the consumption) at this gate, both of which are TOU; therefore, this matter was examined during the audit. The gas gate metering has been tested and confirmed accurate by Vector Transmission. The meter owner for Nova's ICPs (NGCM) has advised that the two meters in question were tested and confirmed as accurate in 2008. Whilst

the meters were within the required accuracy range, they were both recording fast by between 0.61% and 0.95%. NGCM has offered a further theory that the small turndown ratio of these turbine meters may mean that they are operating outside their rated accuracy band for periods, further contributing to the negative UFG.

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 Orion. This comparison confirmed the accuracy of the Orion 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 Orion system, with no manual intervention. Therefore, the only opportunity for error is if the incorrect factors are present within the system.

5. Estimation and Submission Information

5.1 TOU Estimation and Correction (Rule 30.3)

This rule requires that retailers must provide the best estimate of consumption information to the allocation agent in situations where actual data is not available. Estimation and correction activities are conducted by the Account Managers and a check is conducted by the Operations Engineer.

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 previous consumption periods are used in conjunction with customer liaison to determine a likely profile.

Five examples were examined. There were two ICPs where the initial data was incorrect and this was missed during validation; despite register readings being available for this purpose. Submission occurred based on “actual” data that was only found to be incorrect after the initial submission. The interim submission contained corrected data. Neither file was identified as an estimate because actual data was used. There were three ICPs where meters had failed and estimation was required for entire months based on previous periods and customer liaison. Although both files were estimated, only one was identified in Orion as an estimate. If a bill has been produced then data cannot be re-labelled as estimated. The incorrect identification of estimated data is an alleged breach of rule 30.3.1. The final issue was that of a corrector failure where a register reading was available. The gate profile minus the profile for the only other ICP at the gate was used to apportion the consumption information.

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

The existence of any estimated TOU consumption information is considered a matter of non-compliance. This issue is addressed on a monthly basis and a number of breach allegations have been made as recorded in Section 1.3.

As mentioned in section 1.6, some of the supporting information for estimates and corrections was difficult to locate. I recommend improvements to the journaling and archiving of supporting information to ensure a more effective audit trail is in existence.

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

Nova Energy'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 July 2010 was examined and compared to the data in Nova Energy's system at ICP level; the totals matched which confirms compliance. This also proves that Nova Energy's consumption information provided to the allocation agent is calculated at ICP level and then aggregated.

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. When an ICP is vacant, a "dummy" customer is "moved in" to the account to ensure credit processes continue as expected and to ensure the consumption information is identified, validated and submitted.

As mentioned in Section 2.1.1 there were some ICPs identified with incorrect statuses on the registry. Consumption information is still provided to the allocation agent for these ICPs.

As noted in Section 2.2, the use of incorrect meter pressure information has led to the submission of incorrect consumption information to the allocation agent. Under submission has occurred for 702 ICPs and over submission has occurred for 492 ICPs. This is alleged as a breach of rules 26.2.1 & 28.2.

Nova Energy validates their consumption information at gate level prior to submission. This validation includes the following checks:

- A comparison against the previous month
- A comparison against the previous revision
- Meter count for the supporting ICP level file
- Missing shape files

5.3 Initial Submission Accuracy (Rule 37.2)

Final allocations are complete for the months October 2008 to January 2010. 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.

Nova Energy did not meet this requirement for a number of gas gates during the 16 month period shown. The results are summarised in the table below.

Retailer Code AGCL				
Month	**% Error**	**Total Gas Gates**	**Number Within % Error**	**% Compliant**
October 2008	15	27	19	70%
November 2008	15	27	17	63%
December 2008	15	28	14	50%
January 2009	15	28	18	64%
February 2009	15	29	20	69%
March 2009	15	28	14	50%
April 2009	15	30	24	80%
May 2009	15	32	20	63%
June 2009	15	32	14	44%
July 2009	15	32	25	78%
August 2009	15	35	29	83%
September 2009	15	36	27	75%
October 2009	12.5	35	29	83%
November 2009	12.5	35	23	66%
December 2009	12.5	35	22	63%
January 2010	12.5	34	29	85%

Retailer Code BOPE				
Month	**% Error**	**Total Gas Gates**	**Number Within % Error**	**% Compliant**
October 2008	15	11	5	45%
November 2008	15	11	7	64%
December 2008	15	11	6	55%
January 2009	15	11	6	55%
February 2009	15	11	6	55%
March 2009	15	11	5	45%
April 2009	15	12	7	58%
May 2009	15	14	2	14%
June 2009	15	19	11	58%
July 2009	15	19	14	74%
August 2009	15	19	12	63%
September 2009	15	20	14	70%
October 2009	12.5	20	14	70%
November 2009	12.5	20	5	25%
December 2009	12.5	20	10	50%
January 2010	12.5	23	12	52%

Retailer Code GNVG				
Month	**% Error**	**Total Gas Gates**	**Number Within % Error**	**% Compliant**
October 2008	15	15	14	93%
November 2008	15	15	13	87%
December 2008	15	15	11	73%
January 2009	15	16	12	75%
February 2009	15	16	11	69%
March 2009	15	17	12	71%
April 2009	15	16	15	94%
May 2009	15	16	11	69%
June 2009	15	16	8	50%
July 2009	15	16	15	94%
August 2009	15	16	14	88%
September 2009	15	16	15	94%
October 2009	12.5	16	11	69%
November 2009	12.5	19	15	79%
December 2009	12.5	19	12	63%
January 2010	12.5	19	16	84%

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

Retailer Code AGCL			
Month	**Initial Submission All Gas Gates (GJ)**	**Final Submission All Gas Gates (GJ)**	**Percentage Variation**
October 2008	149,693	147,825	1.3%
November 2008	138,116	130,913	5.5%
December 2008	128,631	114,819	12.0%
January 2009	106,804	99,104	7.8%
February 2009	109,556	101,742	7.7%
March 2009	164,341	130,464	26.0%
April 2009	140,956	139,331	1.2%
May 2009	191,335	214,584	-10.8%
June 2009	223,217	241,407	-7.5%
July 2009	234,677	251,888	-6.8%
August 2009	221,061	219,018	0.9%
September 2009	199,879	200,457	-0.3%
October 2009	194,125	197,397	-1.7%
November 2009	168,270	159,232	5.7%
December 2009	151,783	131,193	15.7%
January 2010	114,833	113,060	1.6%

Retailer Code BOPE			
Month	**Initial Submission All Gas Gates (GJ)**	**Final Submission All Gas Gates (GJ)**	**Percentage Variation**
October 2008	4,326	4,055	6.7%
November 2008	3,788	3,203	18.3%
December 2008	2,791	2,987	-6.6%
January 2009	3,140	2,702	16.2%
February 2009	2,535	2,175	16.6%
March 2009	2,648	2,718	-2.6%
April 2009	3,041	3,339	-8.9%
May 2009	4,630	6,254	-26.0%
June 2009	7,563	8,147	-7.2%
July 2009	8,732	9,011	-3.1%
August 2009	7,715	6,984	10.5%
September 2009	6,011	5,439	10.5%
October 2009	5,168	5,159	0.2%
November 2009	4,291	3,654	17.4%
December 2009	3,539	3,418	3.5%
January 2010	2,835	2,961	-4.3%

Retailer Code GNVG			
Month	**Initial Submission All Gas Gates (GJ)**	**Final Submission All Gas Gates (GJ)**	**Percentage Variation**
October 2008	14,385	14,127	1.8%
November 2008	13,065	12,446	5.0%
December 2008	11,331	10,406	8.9%
January 2009	11,042	9,561	15.5%
February 2009	10,004	9,534	4.9%
March 2009	14,206	11,625	22.2%
April 2009	12,476	13,212	-5.6%
May 2009	19,938	16,870	18.2%
June 2009	21,790	18,658	16.8%
July 2009	18,225	19,130	-4.7%
August 2009	15,582	16,529	-5.7%
September 2009	14,161	14,871	-4.8%
October 2009	14,526	15,549	-6.6%
November 2009	17,790	17,077	4.2%
December 2009	15,472	14,309	8.1%
January 2010	14,836	13,670	8.5%

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. This analysis does not show any specific trends that cause concern.

5.4 Forward Estimates (Rules 34 & 36)

The rules do not prescribe how forward estimates are to be calculated. Nova Energy has prepared and uses historic seasonal adjustment daily shape values. This model enables Nova Energy to achieve a more accurate result than a "flat" estimate would.

5.5 Historic Estimates (Rules 34 & 35)

To assist with determining compliance of the historic estimate processes, Nova Energy 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 Nova Energy's system. Compliance is confirmed for all scenarios. This test also proves that the correct shape file is used in each case.

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.	Has not occurred
C	ICPs become inactive, then active, then inactive again within a month.	Consumption is only calculated for the Active portion of the month.	Has not occurred
E	ICPs start on the 1st day of a month.	Consumption is calculated to include the 1st day of responsibility.	Compliant
F	ICPs end on the last day of the month.	Consumption is calculated to include the last day of responsibility.	Compliant
G	ICPs start part way through a month.	Consumption is calculated to include the 1st day of responsibility.	Compliant
H	ICPs end part way through a month.	Consumption is calculated to include the last day of responsibility.	Compliant
I & J	ICP's are lost and won back in a month.	Consumption is calculated for each day of responsibility.	Has not occurred
N	ICPs start on 1st and end on last day of month.	Consumption is calculated for each day of responsibility.	Has not occurred
O	Rollover reads	Consumption is calculated correctly in the instance of meter rollovers.	Compliant

5.6 Proportion of Historic Estimates (Rule 40.1)

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

5.7 Billed vs Consumption Comparison (Rule 52)

The content of the GAS070 files was proved by selecting some gas gates and checking the bills in Orion for all ICPs at those gates, against the total in the GAS070 files. This confirmed the accuracy of the data. The GAR080 return files were examined for the months October 2009 to December 2010. The tables below compare the consumption information that is submitted to the allocation agent to the billed information. For the 12-month period ending December 2010, the following variances exist:

- AGCL consumption information is 1.6% lower than billed information
- GNVG consumption information is 3.4% lower than billed information
- BOPE consumption information is 9.6% higher than billed information

The AGCL and GNVG discrepancies can be explained by the fact that the revision process for billed data is different to that for consumption data, and the consumption data contains initial submission information for the most recent months, which will include a high proportion of estimated data.

I also compared consumption information to billed information for the 24-month period ending September 2010. I combined the data for the AGCL and GNVG participant codes and excluded initial submission information so the comparison only included interim and final submission information. This analysis showed that the consumption information was 0.83% higher than the billed information.

The BOPE discrepancy is a result of delayed billing in late 2010 due to the transition from the NCS billing system to Orion.

Although these figures cannot be directly compared, they provide a useful indicator to ensure that under reporting of consumption information is not occurring.

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

Retailer Code - AGCL			
Month	**Billed**	**Consumption**	**% Difference**
October 2009	2,157,468	2,041,729	-5.4%
November 2009	2,165,827	2,076,134	-4.1%
December 2009	2,177,157	2,112,659	-3.0%
January 2010	2,190,430	2,116,891	-3.4%
February 2010	2,202,604	2,100,439	-4.6%
March 2010	2,203,632	2,096,439	-4.9%
April 2010	2,144,641	2,099,167	-2.1%
May 2010	2,124,592	2,092,675	-1.5%
June 2010	2,130,232	2,097,096	-1.6%
July 2010	2,151,396	2,122,494	-1.3%
August 2010	2,200,107	2,153,967	-2.1%
September 2010	2,196,517	2,181,247	-0.7%
October 2010	2,210,931	2,185,027	-1.2%
November 2010	2,225,563	2,189,619	-1.6%
December 2010	2,262,038	2,226,426	-1.6%

Retailer Code - GNVG			
Month	**Billed**	**Consumption**	**% Difference**
October 2009	2,716,702	3,104,752	14.3%
November 2009	2,711,026	3,110,729	14.7%
December 2009	3,066,138	3,131,040	2.1%
January 2010	3,100,219	3,162,660	2.0%
February 2010	3,115,485	3,179,078	2.0%
March 2010	3,169,976	2,732,205	-13.8%
April 2010	3,162,916	3,031,646	-4.2%
May 2010	3,212,068	3,256,409	1.4%
June 2010	3,281,513	3,280,873	0.0%
July 2010	3,361,096	3,337,530	-0.7%
August 2010	3,422,270	3,385,075	-1.1%
September 2010	3,485,205	3,439,847	-1.3%
October 2010	3,569,228	3,491,162	-2.2%
November 2010	3,752,206	3,570,389	-4.8%
December 2010	3,886,547	3,756,171	-3.4%

Retailer Code - BOPE			
Month	**Billed**	**Consumption**	**% Difference**
October 2009	57,747	60,156	4.2%
November 2009	58,237	59,906	2.9%
December 2009	58,684	59,823	1.9%
January 2010	59,025	59,498	0.8%
February 2010	59,327	59,604	0.5%
March 2010	59,628	59,645	0.0%
April 2010	59,666	59,340	-0.5%
May 2010	59,498	57,723	-3.0%
June 2010	60,241	57,646	-4.3%
July 2010	62,038	61,058	-1.6%
August 2010	64,926	66,316	2.1%
September 2010	67,992	70,429	3.6%
October 2010	68,328	73,711	7.9%
November 2010	70,220	76,861	9.5%
December 2010	71,461	78,356	9.6%

6. Recommendations

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

- Some data collection agents send monthly "text" files as email attachments. This method is not considered secure and I recommend that these files be zipped with password protection to ensure their security during transmission.
- The supporting information for TOU corrections is kept in various locations and was difficult to find during the audit. I recommend that a journal is kept in Orion that contains summary information and also a reference to the location of additional information, which should be kept in a central directory.
- When submission files are replaced, I recommend that all versions of files are retained for audit trail purposes.
- I recommend that Nova Energy checks all ICPs at ACTV and updates the registry to ACTC for all ICPs with a customer recorded.
- For BOPE the connection date provided by the distributor is often before the metering installation date by several days. The date provided by the distributor is used as the ACTC date; however, gas cannot be consumed until a meter is installed. The more recent of the two dates should be used as the ACTC date.
- 1,143 meter pressure discrepancies were found between Nova Energy's and meter owners' records. Meter dockets were examined for 129 ICPs and it was found that for 9 of the 119, the meter pressure originally notified by the meter owner was incorrect. I recommend that meter dockets be checked for a further 400 ICPs to determine the extent of the inaccuracy of meter owners' records.
- 572 meter dial discrepancies were found between Nova Energy's and meter owners' records. I recommend that validation occurs on a monthly basis with meter owners to address this matter.
- Nova Energy uses temperature data that was supplied by NIWA. This data seems to be different to more recent data. I recommend that Nova Energy refreshes this data and records its source and the date it was loaded into Orion.
- The CV upload process contains manual steps. The upload was not completed for the day of the audit. I recommend that Nova Energy considers implementing monitoring or reporting of CV population to ensure ongoing accuracy.
- I recommend that Nova Energy examine the process for preparing the GAS080 reports to ensure ongoing accuracy.

- There are approximately 15 ICPs where the register readings are not available for TOU validation. I recommend that these readings are sought and used in the validation process.
- Event log and alarm log reporting is not reviewed as part of the TOU validation process. I recommend that this is included as a validation step.

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

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

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

Two additional recommendations are made in relation to meter information:

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

Appendix 1 – Control Rating Definitions

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