Gas Downstream Reconciliation Performance Audit Final Report

For

Genesis Power Limited

Prepared by Steve Woods – Veritek Ltd

Date of Audit: 25/11/10 & 26/11/10

Date Audit Report Complete: 12/04/11

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 Genesis Energy (Genesis) 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 Genesis's control environment is "effective" for eleven of the areas evaluated and "adequate" for the other six. 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:

- The use of incorrect meter pressure information has led to the under submission of consumption information to the allocation agent of at least 8.9 TJ for a twelve month period.
- There are 231 allocation group 6 ICPs with consumption between 250GJ and 10TJ, that should be recorded as allocation group 4.
- Estimated TOU consumption information has been submitted to the allocation agent on a number of occasions from May 2009 to September 2010. Genesis'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.
- The initial submission accuracy did not meet the 15% requirement for all gas gates for the period October 2008 to September 2009.
- The process for preparing the "as billed" file does not reflect billed quantities that are contained in Gentrack for GEND (TOU information). This file is merely the GAS050 file with a one month offset. This process does not comply with the definition contained in rule 52.3.2, which requires that this information is "...sourced directly from retailer's financial records"

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	Compliant	Some time delays exist with the registry update systems and processes. A recommendation is made in relation to 10,281 ICPs where the altitude is recorded as zero, and may be inaccurate.
Metering set up information	2.2	Adequate	Not compliant	Some meter pressure and meter dial discrepancies exist between Genesis's and meter owners' records. I recommend that Genesis 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	Robust controls are in place for the management of billing factors.
Archiving of reading data	3.1	Effective	Compliant	Robust controls are in place for the security of meter reading data.
Meter interrogation requirements	3.2	Adequate	Not compliant	There are 231 allocation group 6 ICPs with consumption between 250GJ and 10TJ, that should be recorded as allocation group 4.
Meter reading targets	3.3	Adequate	Compliant	Meter reading attainment processes are robust.
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	Effective	Compliant	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.
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	Effective	Not compliant	Genesis'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.
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 Genesis's and meter owners' records. This has resulted in incorrect consumption information being submitted to the allocation agent.
Initial submission accuracy	5.3	Effective	Not compliant	Genesis uses historic seasonal adjustment daily shape values, which are then "scaled" depending on temperature relevant to historic temperature. Although compliance has not been achieved, the process is robust.
Forward estimates	5.4	Effective	Compliant	Genesis uses historic seasonal adjustment daily shape values, which are then "scaled" depending on temperature relevant to historic temperature.

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	Not compliant	Genesis's consumption information that is submitted to the allocation agent is lower than the billed information by 0.9% for the 12-month period ending August 2010. Although these figures cannot be directly compared, they provide a useful indicator to ensure that under reporting of consumption information is not occurring. The GEND "as billed" file is not derived from financial records.

Persons Involved in This Audit

Auditor:

Steve Woods
Veritek Limited

Genesis personnel assisting in this audit were.

Name	Title
Andrew Maseyk	Reconciliation and Switching Manager
Tara Ingram	Senior Reconciliation Systems Analyst
Marcel Green	Senior Data Reconciliation Analyst
Sarah Ainsley	Team Leader Invoice Management
Carol Anne Manning	Registry Analyst
David Whitfield	Technical Advisor Compliance

Service providers assisting with processes within the audit scope:

Company	Processes
DataCol New Zealand	Gathering and storing raw meter data
Delta Utility 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
GasCo North and South	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, -

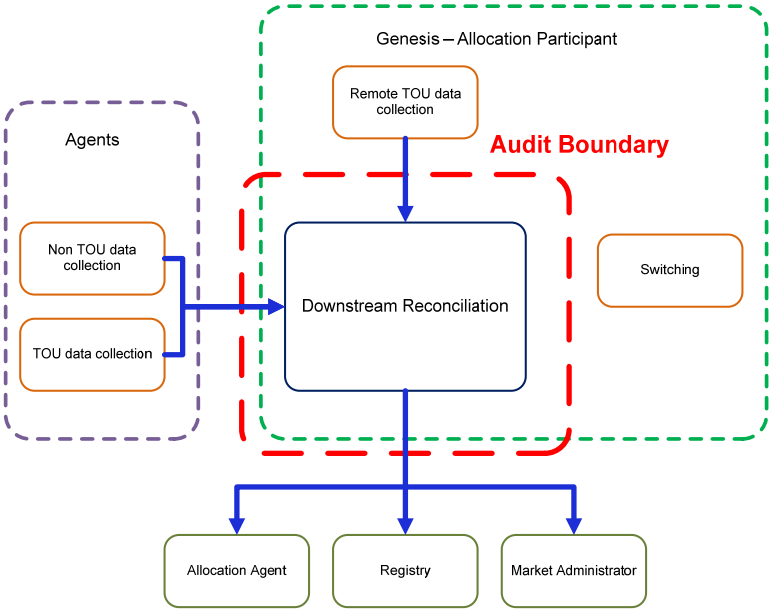
65.2.1 The performance of the allocation agent or that allocation participant in terms of compliance with these rules; and

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 both retailer codes, GENG and GEND.

The audit was carried out on November 25th and 26th at Genesis's offices in Hamilton.

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 Genesis 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 Genesis 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 Genesis'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 Genesis'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 Eighteen ICPs were identified with meter pressure discrepancies between Genesis data and meter owner data. Investigations into these discrepancies were not complete by the time the final event audit report was produced. This matter is discussed further in Section 2.2.

Genesis has 80 alleged breaches recorded by the Market Administrator since October 2008. None of the alleged breaches were considered "material" by the market administrator. They are summarised as follows:

Nature of Breach	Rule	Quantity	Section in this Report
Switching Breaches		13	Not within audit scope
Submission of estimated TOU data	31, 32 & 33	36	5.1
Initial vs final allocation variances more than 15 %	37.2	12	5.3
Incorrect submission information	26	2	
Late historical information	78	2	
Late trading notification	39.2.3	13	
Late GAS070 file	52	2	5.7

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
The use of incorrect meter pressure information has led to the under submission of consumption information to the allocation agent of at least 8.9 TJ for a twelve month period.	26.2.1, & 28.2	2.2, & 5.2
There are 231 allocation group 6 ICPs with consumption between 250GJ and 10TJ, that should be recorded as allocation group 4.	29	3.2
Estimated TOU consumption information has been provided on a number of occasions from May 2009 to September 2010. Genesis'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.	30.3	5.1
Genesis's's initial submission accuracy did not meet the 15% requirement for all gas gates for the period October 2008 to September 2009.	37.2	5.3
The process for preparing the GAS070 file does not reflect billed quantities that are contained in Gentrack for GEND (TOU information). This file is merely the GAS050 file with a one month offset. This process does not comply with the definition contained in rule 52.3.2, which requires that this information is "...sourced directly from retailer's financial records"	52	5.7

1.4 Provision of Information to the Auditor (Rule 69)

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

Information was provided by Genesis 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 party responded.

Party	Response	Comments provided	Attached as appendix
Powerco	Yes	Yes	Yes

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 the audit report.

Powerco indicated a desire to better understand some of the issues raised in this report. The materiality of errors noted in the report was specifically mentioned. I have made a recommendation in Section 6 that the issue of meter pressure discrepancies is addressed at an industry wide level.

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..." Compliance is confirmed with this rule in relation to consumption information supplied to the allocation agent; however, TOU data collection agents send monthly "text" files 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. Genesis monitors the registry acknowledgement files to ensure the registry has been updated correctly from information sent. On a monthly basis, there is a check between the registry and Gentrack for the status and retailer fields. Any discrepancies are investigated and resolved. A complete validation was conducted between the registry and Gentrack approximately six months ago, and Genesis intends to conduct this validation monthly.

The event detail report was checked and it was found that 1,120 ICPs had their status changed to ACTC during the period September 13th to September 24th 2010. The registry was updated more than five business days after the actual event date for 857 of the 1,120 ICPs, and for 378 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 17 days. 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.

When an ICP is established in Genesis's system 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 identification and registration is managed by outbound calling to "register" the customer 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.

513 ICPs were changed to ACTV during the same period, and 18 of these had registry update dates of more than 20 business days. Forward estimates would have been calculated for these until the registry was updated.

2.1.2 Altitude Information

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

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."

Genesis 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 has been met for all ICPs 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 very accurate. POCO has only one ICP where the altitude figure differs by more than 20m.

Distributor	Total ICPs	ICPs checked	Quantity within 20m
UNLG	12,888	20	20
NGCD	56,990	20	20
POCO	58,137	20	19
GNET	3,210	20	20

A further evaluation was conducted of ICPs where the altitude figure was zero on the registry. This data appears to be less accurate than when a figure other than zero is populated. The results are shown in the table below.

Distributor	Total ICPs	ICPs with altitude of zero	ICPs checked	Quantity within 20m
UNLG	12,888	280	20	5
NGCD	56,990	54	20	9
POCO	58,137	9,947	20	9
GNET	3,210	0	0	

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. I recommend that Genesis liaise with distributors to determine whether many of the ICPs with an altitude of zero should have more accurate figures populated. Genesis should keep GIC informed of progress in relation to this matter, and if improvements are not made to the accuracy of this data, Genesis should consider alleging a breach of the relevant Gas (Switching Arrangements) Rules 2008.

2.2 Metering Set-up Information

The event audits mentioned in Section 1.3 identified some meter pressure discrepancies. Genesis then conducted some further analysis for all gas gates and identified 1,569 ICPs where the meter pressure did not match that provided by the meter owner, and the consumption variance for a 12 month period was 500kWh or greater. These discrepancies have resulted in the under reporting of consumption information to the allocation agent of approximately 8.6TJ for a twelve month period.

I also compared the meter pressure recorded by Genesis against information provided by meter owners. This analysis showed 4,257 meter pressure discrepancies, indicating a further 2,688 ICPs where the consumption variance was less than 500kWh for a 12 month period. These discrepancies resulted in the under reporting of consumption information to the allocation agent of approximately 300GJ for a twelve month period. Customer billing was based on the same information, therefore there was no benefit to Genesis resulting from the under reporting of consumption information.

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

The discrepancies identified are shown in the table below.

Meter Owner	Total ICPs	Meter Pressure Discrepancies	Meter Dial Discrepancies
NGC	111,891	1,356	656
Powerco	34,804	1,466	137
Gas Net	3,264	508	55
Nova	308	16	0
Contact	22,495	911	874
	Total Discrepancies	**4,257**	**1,722**

Meter dockets, or other records, were requested from meter owners to confirm the accuracy of their data for a sample of 119 discrepancies. This analysis showed that the meter owner information originally supplied was incorrect for 22 ICPs. A summary of this analysis is shown below.

Meter owner	Discrepancies Evaluated	Meter Owner Data Incorrect
NGC	30	3
Powerco	47	3
Gas Net	22	16
Contact	20	0
Totals	**119**	**22**

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 Genesis check the meter dockets for a further 400 potential discrepancies to determine the extent of the inaccuracy of meter owners' records.

Gas Net has advised that they are in the process of validating all of their metering data and retailers will be advised of the results once this work is complete.

Nova was only able to conduct one on-site check, which confirmed that the Genesis figure was correct.

The invoices for a sample of 15 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. Although this "safety net" appears to be robust, 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.

Genesis 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. Genesis has advised that the source of the data is a file from NIWA that was provided in approximately 2005. Genesis believes the temperature data contained in the file may be an average of 300mm below and 300mm above ground level. The temperature data for gas gates HTV11301 and ALF15501 was compared to data recently provided by NIWA and the figures used by Genesis appear to be approximately 1.5ºc to 2.0ºc lower. This could result in consumption information for ICPs at these gas gates being calculated low by approximately 0.5%.

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

Genesis does not apply the Joule Thompson effect adjustment because network pressure information on the registry is not 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. It is recommended that distributors be required to populate this information accurately on the registry for use by retailers.

2.3.2 Calorific Values

Gas composition data is sourced from the Open Access Transmission Information System (OATIS) and is loaded into Gentrack. The accuracy of the Gentrack information was checked by comparing an OATIS file with the contents of Gentrack for November 2010. In all cases, the information in Gentrack was correct.

The process was also observed for the daily downloading of this data. Whilst this process includes some manual steps, the personnel involved appear to be following well-defined steps. This matter was identified as an area of low risk by Genesis's internal audit team in July 2009 and as a result reporting is now in place to identify any anomalies in the data.

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

Some data provided by Genesis's meter reading contractor was checked and it was found that the readings matched the data in Gentrack. This proves the end-to-end process. This data is transmitted via FTP, which ensures its security and integrity.

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.

Genesis conducts analysis of consumption on a monthly basis to ensure ICPs are in the correct allocation groups. The most recent report was reviewed, which contained 231 allocation group 6 ICPs with consumption between 250GJ and 10TJ. Six of these ICPs were examined with consumption over 1 TJ and in all cases they had been with Genesis for approximately two years. Compliance has not been achieved with rule 29.

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.

Genesis provided a copy of the GAS080 report for September 2010, along with a list of 142 ICPs not read within the last 12 months. The records in Gentrack were checked for a selection of ten of the 142 installations and it was found that "exceptional circumstances" did exist in all cases and that attempts had been made to contact customers through the provision of access letters.

The table below shows the GAS080 results for September 2010.

Target	Reading Percentage (GAS080)
Rolling 4 months (target 90%)	99.50%
12 months (target 100%)	99.86%

Genesis 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

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 Genesis.

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 Genesis. This validation looks for obvious file errors or file corruption and invalid metering information.

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:

- Short read period
- Long read period
- High dollar amount

- Zero consumption
- Negative consumption
- Consumption on inactive and vacant premises

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.

The final level of validation occurs during "submission validation" in the "consumption validation manager" tool. Each ICP is allocated to a "customer load profile" group and readings are either accepted or rejected based on whether they fit within an expected consumption band. Those readings that fail validation are recalculated to fit the expected profile. Readings that fail validation at this point have already been "billed" so notification is made back to the billing team when recalculation has occurred.

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.

The process for "stopped meter" error correction was examined, along with one specific example. The meter had stopped in January 2005, and was found in 2010. Consumption for the period affected was estimated based on the average consumption for previous years. Consumption information was corrected in Gentrack and therefore will automatically appear in the relevant revision files provided to the allocation agent.

3.5 TOU Validation

Genesis's TOU data is collected using the Master Link system for eight ICPs. Manual downloads are conducted for the remaining 30 ICPs, or if there is an equipment failure and data cannot be obtained automatically. Clock synchronisation 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 data has been collected it is then imported into an Access database that is used to create the GAS050 file for submission to the allocation agent. Prior to the preparation of this file, validation occurs visually in a spreadsheet. This validation includes a check against previous data and a check of the consumption profile in a graphical format.

There is an additional check against the billed values, which are derived from meter register readings.

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 Gentrack. This comparison confirmed the accuracy of the Gentrack 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 Gentrack 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.

In these situations, Genesis uses the consumption and profile from similar time periods to create estimates, which are appropriately identified.

Two examples were examined. One where the manually collected data was provided in a different format than expected and the resulting consumption information was calculated low by approximately 50%. Once the data was corrected the relevant revision file reflected the correct values. The second example was a situation where estimated data was provided to the allocation agent. The estimation was based on a similar time period and the data was appropriately identified as estimated.

Genesis'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.

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

Genesis'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 October 2010 was examined and compared to the data in Genesis's system at ICP level; the totals matched which confirms compliance. This also proves that Genesis'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, even though this consumption is not billed.

As noted in Section 2.2, the use of incorrect meter pressure information has led to the under reporting of consumption information to the allocation agent of approximately 8.9 TJ for a twelve month period. This is alleged as a breach of rules 26.2.1 & 28.2.

5.3 Initial Submission Accuracy (Rule 37.2)

Final allocations are complete for the months October 2008 to September 2009. Rule 37.2 requires that the accuracy of consumption information, for allocation groups 3 to 6, for initial allocation must be within a certain percentage of error published by the industry body. The published percentage for the months analysed is 15%.

Genesis did not meet this requirement for a number of gas gates during the 9 month period shown. The results are summarised in the table below.

Month	Total Gas Gates	Number Within 15%	% Compliant
October 2008	82	51	62%
November 2008	80	41	51%
December 2008	81	34	42%
January 2009	80	30	38%
February 2009	81	30	37%
March 2009	81	46	57%
April 2009	82	47	57%
May 2009	81	42	52%
June 2009	82	52	63%
July 2009	82	43	52%
August 2009	82	55	67%
September 2009	82	56	68%

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

Month	Initial Submission All Gas Gates (GJ)	Final Submission All Gas Gates (GJ)	Percentage Variation
October 2008	341,973	314,044	8.9%
November 2008	259,501	237,753	9.1%
December 2008	193,654	186,697	3.7%
January 2009	165,696	160,755	3.1%
February 2009	139,343	149,268	-6.6%
March 2009	205,137	205,165	0.0%
April 2009	251,011	253,339	-0.9%
May 2009	433,423	477,165	-9.2%
June 2009	568,921	581,908	-2.2%
July 2009	495,280	571,999	-13.4%
August 2009	439,746	438,914	0.2%
September 2009	393,419	356,040	10.5%

The tables above show that the consumption information submitted to the allocation agent for the initial submission was over estimated from October 2008 to January 2009. The opposite scenario exists for the months February 2009 to July 2009, where the consumption information submitted to the allocation agent for the final allocation is higher than that submitted for the initial allocation.

5.4 Forward Estimates (Rules 34 & 36)

The rules do not prescribe how forward estimates are to be calculated. Genesis uses an "estimated seasonal profile model (ESPM) for forward estimation. In summary this model uses historic seasonal adjustment daily shape values which are then "scaled" depending on temperature relevant to historic temperature. This model enables Genesis 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, Genesis 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 Genesis'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 for GENG by selecting some gas gates and checking the bills in Gentrack for all ICPs at that gate, 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 August 2010. The table below shows that Genesis's consumption information that is submitted to the allocation agent is lower than the billed information by 0.9% for the 12-month period ending August 2010. This discrepancy can be explained by the fact that the revision process for billed data is different to that for consumption data.

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

Month	Billed	Consumption	% Difference
October 2009	4,015,389	4,024,807	0.2%
November 2009	4,033,887	4,010,289	-0.6%
December 2009	4,037,123	4,004,031	-0.8%
January 2010	4,027,881	3,995,913	-0.8%
February 2010	4,012,958	3,967,565	-1.1%
March 2010	4,002,957	3,935,185	-1.7%
April 2010	3,920,346	3,905,527	-0.4%
May 2010	3,792,081	3,728,075	-1.7%
June 2010	3,702,527	3,565,439	-3.7%
July 2010	3,703,590	3,622,901	-2.2%
August 2010	3,740,652	3,705,575	-0.9%

The process for preparing the GAS070 file was also examined for GEND (TOU information). This file is merely the GAS050 file with a one month offset. It does not reflect billed quantities that are contained in Gentrack. This process does not comply with the definition contained in rule 52.3.2, which requires that this information is "...sourced directly from retailer's financial records"

6. Recommendations

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

- TOU 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.
- 10,281 ICPs have "zero" populated in the registry altitude field. I recommend that Genesis liaise with distributors in relation to this matter to determine whether many of these ICPs should have more accurate figures populated. Genesis should keep GIC informed of progress in relation to this matter, and if improvements are not made to the accuracy of this data, Genesis should consider alleging a breach of the relevant Gas (Switching Arrangements) Rules 2008.
- 4,257 meter pressure discrepancies were found between Genesis's and meter owners' records. Meter dockets were examined for 119 ICPs and it was found that for 22 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.
- 1,722 meter dial discrepancies were found between Genesis's and meter owners' records. I recommend that validation occurs on a monthly basis with meter owners to address this matter.
- Genesis uses temperature data that was supplied by NIWA in approximately 2005. This data seems to be different to more recent data. I recommend that Genesis refreshes this data and records its source and the date it was loaded into Gentrack.
- 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.

An additional 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.

Three recommendations are made in relation to the setup and maintenance of 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 and meter dials as registry fields that are maintained by meter owners.

- That the switching rules be amended to include an accuracy requirement for altitude information populated by distributors.

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.

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 – Powerco Comments

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23 March 2011

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POWERCO

Dear Steve,

Gas Downstream Reconciliation Performance Audit Draft Report for Genesis Power Limited

1. Thank you for the opportunity to comment on the '*Gas Downstream Reconciliation Performance Audit Draft Report for Genesis Power Limited*'.

2. We are keen to gain a better understanding of the practical issues identified in the report so we can investigate them in more detail. In particular we would wish to discuss the methodology used and materiality of any errors before identifying how best to make any changes required.

3. Powerco looks forward to working with the Gas Industry Company to better understand the issues raised in this audit. We take our responsibilities as a prudent network operator very seriously and as a result seek to understand and resolve issues as we become aware of them.

Yours sincerely,

Charlotte Littlewood

Charlotte Littlewood
Regulatory Manager
Powerco