Gas Downstream Reconciliation Performance Audit Final Report

For

Contact Energy Limited

Prepared by Tara Gannon & Steve Woods – Veritek Ltd

Date of Audit: 19/10/2020 to 02/11/2020

Date Audit Report Complete: 21 December 2020

Executive Summary

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

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

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

The summary of report findings in the table below shows that Contact's control environment is "effective" for 14 of the areas evaluated and "adequate" for four areas. Controls over registry updates, covered in more detail in the registry report were not considered to be adequate.

12 of the 19 areas evaluated were found to be compliant. Nine breach allegations are made in relation to the seven remaining areas. They are summarised as follows:

- For ICP 1002055361QTBCC the altitude used to calculate the altitude factor matches the registry but does not match the actual altitude of the ICP. The difference resulted in the altitude factor applied being outside of the maximum permissible error under NZS 5259:2015.

- 30 ICPs had pressure discrepancies which resulted in differences outside the maximum permissible errors allowed in NZS 5259:2015.

- From 20/08/19 until 26/07/20 gas composition data in SAP was estimated based on the last value recorded when actual data was available, resulting in some calorific values outside the maximum permissible error allowed under NZS 5259:2015. Correct gas composition data has been loaded into SAP, and revised volumes will be washed up. Additional controls over the process have been implemented.

- ICPs 0000953421QTD8B (01/07/08 onwards), 1001133052QTBC8 (01/07/08 onwards), 0000298891QTFA0 (21/11/17 - 30/09/20), and 0000322631QT591 (05/04/17 - 21/05/20) have TOU metering and consume more than 250 GJ pa but have allocation group 4 assigned.

- 239 allocation group 4 ICPs did not have actual meter readings recorded in the previous month as at July 2020.

- Exceptional circumstances not demonstrated for one ICP not read in the 12 months ending July 2020. The meter reading attainment requirements were not consistently met between July 2019 and November 2019.

- The meter reading attainment requirements were not consistently met between July 2019 and November 2019.

- The correction for inactive consumption for ICP 0000060471QT952 excluded consumption between 28/05/20 and 29/06/20, and a further correction is to be completed.

- The initial submission accuracy did not meet the required accuracy percentage for some gas gates for the period May 2017 to May 2019.

Non conformance is recorded in the Gas Registry and Switching Performance Audit Report because the registry was not populated within two business days of Contact entering into a contract to supply gas to a consumer for 29 of 30 examples checked.

Some recommendations for improvement have been made, particularly around the speed of processing corrections and returned paperwork for field services jobs, and review of the read validation process.

Summary of Report Findings

Issue	Section	Control Rating (Refer to Appendix 1 for definitions)	Compliance Rating	Comments
Transmission methodology and audit trails	1.5	Effective	Compliant	
ICP set up information	2.1	Not adequate	Not compliant	Some late registry updates were identified. The registry was not populated within two business days of Contact entering into a contract to supply gas to a consumer for 29 of 30 examples checked, which is recorded as non conformance in the Gas Registry and Switching Performance Audit Report. For ICP 1002055361QTBCC the altitude used to calculate the altitude factor matches the registry but does not match the actual altitude of the ICP. The difference resulted in the altitude factor applied being outside of the maximum permissible error under NZS 5259:2015.
Metering set up information	2.2	Adequate	Not compliant	30 ICPs had pressure discrepancies which resulted in differences outside the maximum permissible errors allowed in NZS 5259:2015.
Billing factors	2.3	Adequate	Not compliant	From 20/08/19 until 26/07/20 gas composition data in SAP was estimated based on the last value recorded, when actual data was available, resulting in some calorific values outside the maximum permissible error allowed under NZS 5259:2015. Correct gas composition data has been loaded into SAP, and revised volumes will be washed up. Additional controls over the process have been implemented.

Issue	Section	Control Rating (Refer to Appendix 1 for definitions)	Compliance Rating	Comments
Archiving of reading data	3.1	Effective	Compliant	
Meter interrogation requirements	3.2	Adequate	Not compliant	ICPs 0000953421QTD8B (01/07/08 onwards), 1001133052QTBC8 (01/07/08 onwards), 0000298891QTFA0 (21/11/17 - 30/09/20), and 0000322631QT591 (05/04/17 - 21/05/20) have TOU metering and consume more than 250 GJ pa but have allocation group 4 assigned. 239 allocation group 4 ICPs did not have actual meter readings recorded in the previous month as at July 2020.
Meter reading requirements	3.3	Adequate	Not compliant	Exceptional circumstances not demonstrated for one ICP not read in the 12 months ending July 2020. The meter reading attainment requirements were not consistently met between July 2019 and November 2019.
Non TOU validation	3.4	Effective	Compliant	Contact uses validation robots (Bots), which are sometimes not operating as expected. Contact is investigating these issues and I have raised a recommendation to maintain visibility of this issue.

Issue	Section	Control Rating (Refer to Appendix 1 for definitions)	Compliance Rating	Comments
Non TOU error correction	3.5	Effective	Not compliant	The correction for inactive consumption for ICP 0000060471QT952 excluded consumption between 28/05/20 and 29/06/20, and a further correction is to be completed. Recommendations are raised to process corrections more promptly and develop a procedure for inactive consumption caused by creeping meters.
TOU validation	3.6	Effective	Compliant	
Energy consumption calculation	4	Effective	Compliant	I recommend that Contact considers a change to allow conversion factor information to be viewed in SAP's front end, which will allow more efficient investigation of any future gas conversion issues and processing of corrections relating to conversion factors, as well as assisting with audits.
TOU estimation and correction	5.1	Effective	Compliant	No ICPs have been settled as TOU since 30/04/20.
Provision of retailer consumption information	5.2	Effective	Compliant	A minor recommendation is made to enhance the validation checks.
Initial submission accuracy	5.3	Effective	Not compliant	The initial submission accuracy did not meet the required accuracy percentage for some gas gates for the period May 2017 to May 2019.

Issue	Section	Control Rating (Refer to Appendix 1 for definitions)	Compliance Rating	Comments
Forward estimates	5.4	Effective	Compliant	A recommendation is raised to review final revisions to identify forward estimate remaining, and the reasons forward estimate remains and permanent estimates were not entered. Conduct training and process improvements to ensure that permanent estimates are inserted prior to the final revision.
Historic estimates	5.5	Effective	Compliant	
Proportion of HE	5.6	Effective	Compliant	
Billed vs consumption comparison	5.7	Effective	Compliant	
Gas Trading Notifications	5.8	Effective	Compliant	

Persons Involved in This Audit

Auditors:

Tara Gannon
Veritek Limited

Steve Woods
Veritek Limited

Contact personnel assisting in this audit were:

Name	Title
Bernie Cross	Reconciliation Manager
Darren Law	Field Services Team Leader
George Fleming	Collections and Assurance Team Member
Adam Ward	Operations Team Leader (Billing)
Aaron Collins	Field Services Team Member
Azmin Hamin	Operations Team Member
Helen Capp	Operations Team Leader
Debby Abrahams	Commercial Manager
Alison Lohmann	Business Assurance

Service providers assisting with processes within the audit scope:

Company	Processes
MRS	Meter reading

Contents

1. Pre-Audit and Operational Infrastructure Information

1.1 Scope of Audit

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

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

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

The audit was completed remotely using Microsoft Teams between 19/10/2020 and 02/11/2020.

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

1.2 Audit Approach

As mentioned in **section 1.1** the purpose of this audit is to assess the performance of Contact 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 Contact 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 Contact'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.

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

Where compliance is reliant on manual processes, manual data entry for example, the sample size has been increased to a magnitude that, in my judgement, ensures the result has statistical significance.

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

1.3 General Compliance

1.3.1 Summary of Previous Audit

The previous audit was completed in 2016 by Langford Consulting and Veritek Limited. Six breach allegations were made, and resolution of these matters is summarised in the table below:

Breach Allegation	Rule	Section in this report	Resolution
Initial vs final allocation variances more than the allowable threshold	37.2	8.3	The Market Administrator did not raise any material issues.
Energy conversion not compliant with NZS 5259 Altitude discrepancies Meter discrepancies	28.2	2.1.2 2.2	The Market Administrator did not raise any material issues.
Incorrect allocation groups	29	3.2	The Market Administrator did not raise any material issues.
Historical corrections for pressure discrepancies	26.2	3.5	The Market Administrator did not raise any material issues.
GAS040 files not compliant during the transition from Gentrack to SAP	31.4	5.2	The Market Administrator did not raise any material issues.
Energy quantities billed file was estimated during the transition from Gentrack to SAP	52.2.1	5.7	The Market Administrator did not raise any material issues.

1.3.2 Breach Allegations

Contact has 33 alleged breaches recorded by the Market Administrator between 1 October 2016 and July 2020 excluding the six alleged breaches raised in relation to the 2017 performance audit. These are summarised as follows:

Breach Allegation	Breach No.	Rule	Section in this report	Outcome
Alleged breaches raised by EMS for initial vs final allocation variances				
Initial vs final allocation variances.	33 between 2016-086 and 2019-042	37.2	5.3	The Market Administrator did not raise any material issues.
Alleged breaches raised by Contact				
Incorrect volumes were submitted for WST03610 between May 2013 and June 2018 due to incorrect application of a multiplier.	2018-159	26.2	5.2	The alleged breach remains open pending the GIC's calculation of market impact, and determination of whether an industry agreed settlement is required.

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

Breach Allegation	Rule	Section in this report
For ICP 1002055361QTBCC the altitude used to calculate the altitude factor matches the registry but does not match the actual altitude of the ICP. The difference resulted in the altitude factor applied being outside of the maximum permissible error under NZS 5259:2015.	GDRR 28.2	2.1.2
30 ICPs had pressure discrepancies which resulted in differences outside the maximum permissible errors allowed in NZS 5259:2015.	GDRR 28.2	2.2
From 20/08/19 until 26/07/20 gas composition data in SAP was estimated based on the last value recorded, when actual data was available, resulting in some calorific values outside the maximum permissible error allowed under NZS 5259:2015. Correct gas composition data has been loaded into SAP, and revised volumes will be washed up. Additional controls over the process have been implemented.	GDRR 28.2	2.3.2

Breach Allegation	Rule	Section in this report
ICPs 0000953421QTD8B (01/07/08 onwards), 1001133052QTBC8 (01/07/08 onwards), 0000298891QTFA0 (21/11/17 - 30/09/20), and 0000322631QT591 (05/04/17 - 21/05/20) have TOU metering and consume more than 250 GJ pa but have allocation group 4 assigned.	GDRR 29.2	3.2
239 allocation group 4 ICPs did not have actual meter readings recorded in the previous month as at July 2020.	GDRR 29.4.2	3.2
Exceptional circumstances not demonstrated for one ICP not read in the 12 months ending July 2020.	GDRR 29.4.3	3.3
The meter reading attainment requirements were not consistently met between July 2019 and November 2019.	GDRR 29.5	3.3
The correction for inactive consumption for ICP 0000060471QT952 excluded consumption between 28/05/20 and 29/06/20, and a further correction is to be completed.	GDRR 26.2	3.5
The initial submission accuracy did not meet the required accuracy percentage for some gas gates for the period May 2017 to May 2019.	GDRR 37.2	5.3

A breach allegation is also raised for one distributor in relation to an incorrect altitude recorded on the registry:

Breach Allegation	Participant	Rule	Section in this report
For ICP 1002055361QTBCC the altitude used to calculate the altitude factor matches the registry but does not match the actual altitude of the ICP. The difference resulted in the altitude factor applied being outside of the maximum permissible error under NZS 5259:2015. The ICP altitude was recorded as 274 and the Google Earth altitude is 27.	UNLG	GDRR 26.5.1 and 26.5.4	2.1.2

1.4 Provision of Information to the Auditor (Rule 69)

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

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

Information was requested by Contact from metering equipment owners and was provided within the requested timeframe. 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 2015 Amendment Version of the Gas (Downstream Reconciliation) Rules 2008, those parties were given an opportunity to comment on the draft audit report and indicate whether they would like their comments attached as an appendix to the final audit report. The following responses were received:

Party	Response	Comments provided	Included in report
Contact	Yes	Yes	Yes

No changes were made to the report. Contact's comments are included in each section where non-conformance or recommendations are recorded.

1.6 Transmission Methodology and Audit Trails (Rule 28.4.1)

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

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

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

Every retailer must ensure the conversion of measured volume to volume at standard conditions and the conversion of volume at standard conditions to energy complies with NZS 5259:2015, for metering equipment installed at each consumer installation, for which the retailer is the responsible retailer.

Compliance with this rule has been examined in relation to the set-up of ICP, metering and billing information. I have also considered the Gas (Downstream Reconciliation) Rules 2008 Billing factors guideline note v1.0 (Billing Factors Guideline) published by GIC on 30/11/2015 when examining the set up and maintenance of information.

2.1 ICP Set Up Information

2.1.1 New Connections Process

The process was examined for the connection and activation of new ICPs.

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

One of the main issues with the new connections process is that the physical connection is made at the property when the ICP is still at the "ready" status, and at this point the consumer hasn't necessarily registered with a retailer and if Contact is the proposed retailer, the ICP will not be set up in SAP until the connection is confirmed.

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

The "Maintenance Breach History Report (RET breaches)" report was examined for the period January 01/07/19 to 30/06/20. This report contained 1,021 ICPs where the initial registry update was later than two business days. I checked the records for 30 ICPs where the registry update was more than 20 business days. 29 of the 30 updates did not occur within two business days of entering into a contract to supply gas to the consumer. The table below shows the ICPs and the reason for the late updates.

ICP	Event date	Input date	Business days	Reason
1002072638QT53D	4/11/2019	1/02/2020	58	Delay due to backlog
1002060330QT98D	1/10/2019	6/02/2020	84	User error
1002056674QTBCB	23/10/2019	6/02/2020	68	User error
1002073584QT632	10/01/2020	13/02/2020	21	User error
1000584156PGC17	29/11/2019	25/02/2020	55	Paperwork received from network Powerco on 17.02.2020. Delay due to backlog.

ICP	Event date	Input date	Business days	Reason
1000587428PGD34	4/12/2019	13/03/2020	65	Paperwork received from network Powerco on 04.02.2020. Delay due to backlog.
1001298206NGBB7	17/01/2020	19/03/2020	41	Paperwork received from network AMS on 21.02.2020. Delay due to backlog.
1000588430PGCED	10/02/2020	21/03/2020	27	User error.
1002076609QT800	15/02/2020	21/03/2020	22	User error.
1002074476QTBC4	18/12/2019	25/03/2020	63	Paperwork received from network AMS on 26.02.2020. Delay due to backlog.
1002073532QT50F	14/02/2020	26/03/2020	27	Paperwork received from network AMS on 02.03.2020. Delay due to backlog.
1000588665PG3AD	21/01/2020	4/04/2020	50	Paperwork received from network Powerco on 11.03.2020. Delay due to backlog.
1002057337QT10B	27/02/2020	4/04/2020	24	Paperwork received from network AMS on 03.03.2020. Delay due to backlog.
1002077074QT5A0	27/02/2020	4/04/2020	24	Paperwork received from network AMS on 03.03.2020. Delay due to backlog.
1002075973QT223	28/02/2020	4/04/2020	23	Paperwork received from network AMS on 03.03.2020. Delay due to backlog.
1002074644QT6BE	2/03/2020	4/04/2020	22	Paperwork received from network AMS on 03.03.2020. Delay due to backlog.
1002075855QT7FD	2/03/2020	4/04/2020	22	Paperwork received from network AMS on 06.03.2020. Delay due to backlog.
1001298555NG07D	26/02/2020	18/04/2020	33	Paperwork received from Electrix on 10.03.2020. Delay due to backlog.
1002073546QT158	30/01/2020	23/04/2020	55	Paperwork received from network AMS on 16.04.2020. Delay due to backlog.
1002067033QT22E	9/03/2020	23/04/2020	29	Paperwork received from network AMS on 16.03.2020. Delay due to backlog.
1002078949QTD6A	20/04/2020	23/05/2020	21	Delay due to backlog.
1002075976QTF6C	3/02/2020	26/05/2020	75	User error.
1002077705QT3BA	24/03/2020	28/05/2020	42	User error.

ICP	Event date	Input date	Business days	Reason
1000584936PG3EA	9/09/2019	11/06/2020	186	Paperwork received on 11.05.2020. Delay due to backlog.
1002078900QT19E	29/04/2020	11/06/2020	28	Paperwork received on 12.05.2020. Delay due to backlog.
1002078113QT7FE	30/04/2020	11/06/2020	27	Paperwork received on 04.06.2020. Delay due to backlog.
1002072994QT133	30/04/2020	15/06/2020	29	Paperwork received on 02.06.2020. Delay due to backlog.
1002079205QTE7F	5/05/2020	16/06/2020	27	Paperwork received on 20.05.2020. Delay due to backlog.
1001298829NG336	4/05/2020	30/06/2020	38	Paperwork received on 27.05.2020. Delay due to backlog.

As the table above shows, there are two issues causing late registry updates. Seven late updates were due to errors when processing the new connections, and 22 late updates were due to a processing backlog. Although many of the notifications from the networks were late, there was a further delay of between one and four weeks before the registry was updated once the notifications were received.

Contact has recently improved controls to minimise errors with the processing of new connections. The additional controls are:

- weekly reporting of all ICPs at "ready" where CTCT is the proposed retailer,
- reporting of ICPs at "ready" status where meters are installed, and
- peer review of ICP setup before it is finalised.

I checked the "RSREADY" report to identify ICPs at "ready", where Contact is the proposed retailer. The report contained 444 ICPs. As mentioned above, Contact has reporting in place to identify ICPs with metering in the registry where notification has not been provided. This ensures follow up queries can be made to networks.

Non conformance is recorded in the Gas Registry and Switching Performance Audit Report because the registry was not populated within two business days of Contact entering into a contract to supply gas to a consumer for 29 of 30 examples checked.

2.1.2 Altitude Information

It is a distributor's responsibility to populate the registry with correct altitude information to support compliance with NZS 5259:2015, and it is a retailer responsibility to comply with NZS 5259:2015 for the conversion of volume to energy.

NZS 5259:2015, which was published in November 2015, contains the following requirements regarding the way that altitude information should be managed.

1. The maximum permissible error is ± 1.0% where the meter pressure is less than or equal to 100kPa, and ±0.5% where the meter pressure is greater than 100kPa.

2. The following note is also included "Altitude should be determined within 10m where practicable."

A random sample of non TOU ACTC or ACTV ICPs per distributor from the registry list as at 08/07/20 were checked against Google Earth altitude data for the ICP address. The sample was selected by choosing five ICPs with altitudes under 11m and five ICPs with altitudes over 140m per distributor, then choosing a further ten ICPs with altitudes between 11m and 140m per distributor. The Google Earth data is based on the "Shuttle Radar Topography Mission" (SRTM) results and studies indicate an accuracy of ± 10m for altitude. An evaluation against this data is considered an appropriate test for the reasonableness of altitude information. 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 for non TOU ICPs appears to be accurate in most areas.

Distributor	Total ACTC and ACTV non TOU ICPs	ICPs checked	Quantity outside 20m	Quantity outside 90m
UNLG	34,988	20	1	1
NGCD	8,664	20	-	-
POCO	20,487	20	-	-
GNET	1,074	20	-	-
Total	65,213	80	1	1

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. Six ICPs of the 38 ICPs with zero altitudes recorded on the registry were more than 20m different from the Google Earth altitude.

Distributor	Total ACTC and ACTV non TOU ICPs	ICPs with altitude of zero	ICPs checked	Quantity outside 20m	Quantity outside 90m
UNLG	34,988	-	-	-	-
NGCD	8,664	16	16	-	-

Distributor	Total ACTC and ACTV non TOU ICPs	ICPs with altitude of zero	ICPs checked	Quantity outside 20m	Quantity outside 90m
POCO	20,487	22	22	6	-
GNET	1,074	-	-	-	-
Total	65,213	38	38	6	-

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. Distributors must also comply with rule 26.5 of the Gas (Downstream Reconciliation) Rules 2008, which requires them to ensure that any information on the registry is accurate and complete and supports compliance with NZS 5259:2015.

There was one altitude discrepancy which resulted in an altitude factor which was outside the threshold allowed by NZS 5259:2015.

ICP	Meter Pressure	ICP Altitude	Google Earth Altitude	Altitude factor based on reg	Altitude factor based on Google Earth	Difference in altitude factors
1002055361QTBCC	2.75	274	27	0.968616	0.996907	-2.8%

Non-Conformance	Description	Audited party comment
Regarding: Rule 28.2 Control Rating: Effective	For ICP 1002055361QTBCC the altitude used to calculate the altitude factor matches the registry but does not match the actual altitude of the ICP. The difference resulted in the altitude factor applied being outside of the maximum permissible error under NZS 5259:2015.	Response: Contact escalated this issue with the distributor responsible for determining correct altitude values for ICPs. This error has now been corrected on the registry and we have corrected our settlement volumes accordingly.

An alleged breach of GSAR rule 26.5 is raised for UNLG in relation to the incorrect altitude recorded on the registry for ICP 1002055361QTBCC in **section 1.3.2**.

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

Altitude adjustments are applied for TOU ICPs, except where the metering system corrects for absolute pressure. All TOU ICPs had TG register content codes. I checked the altitude factor for one TOU ICP and confirmed that it was within the maximum permissible error set out in NZS 5259:2015.

I confirmed that the altitude factor is included in the gas conversion factor for non TOU ICPs, but not individually itemised. The calculation of the altitude factors is split and bundled in with other parts of the calculation, so I was unable to perform a clean comparison between the individual factor value and a manual recalculation based on NZS 5259:2015. To confirm compliance, I checked the total conversion factor and energy calculated against my manual recalculation for five ICPs and seven read to read periods with different altitudes. In all cases the difference was well below the minimum of the maximum permissible errors for any individual factor. Based on this, I believe that the application of the altitude factors by SAP is correct.

Contact has a set of validation processes and reports to identify and resolve discrepancies, which was demonstrated during the audit. The validation compares SAP and registry altitude, and discrepancies are investigated and resolved. No altitude discrepancies were identified.

2.2 Metering Set-up Information

Contact has a set of validation processes and reports to identify and resolve discrepancies, which was demonstrated during the audit. The validation compares SAP data to registry data for all relevant fields. Whilst reporting is in place to identify discrepancies, there are delays with the resolution of some of these discrepancies, which will sometimes have an effect on billing and reconciliation. Correction processes are discussed in **section 3.5** for non TOU and **5.1** for TOU.

Meter pressure

Meter pressure in kPaG is stored against the meter in a static field in SAP. SAP's gas conversion process applies the meter pressure value at the time of billing. Once billed, the pressure value is "locked" for that read to read period and cannot be changed, unless the bill is reversed.

When pressure changes coincide with a physical meter change, the new pressure will be loaded on the new meter and correctly applied. Where pressure changes are backdated corrections, or physical changes which do not coincide with the meter change, the process varies depending on whether the correct pressure is higher or lower than what has been recorded in SAP.

1. If the correct meter pressure is higher than what was recorded in SAP, SAP will be adjusted effective from the day after the last invoice date. The reconciliation team will process an adjustment to the submission records for any earlier periods affected and will ensure that the full correction is captured within the 12-month period.

2. If the correct meter pressure is lower than what was recorded in SAP, bills will be reversed for all affected customers and the correct pressure will be applied from the pressure change date. If the correction backdated more than 12 months, the reconciliation team will adjust submission records to ensure that the full correction is captured within the 12-month period.

I compared the SAP metering information as at 15/07/20 to the registry list as at 08/07/20 and found 12 meter pressure discrepancies not relating to TOU metering or metering which was removed on the registry. Five of the differences resulted in pressure factors outside the maximum permissible errors in

NZS 5259:2015. For ICP 1002069575QTCC1 the meter pressure in kPa was entered into SAP as the meter pressure in BarG, resulting in a 639.7% difference.

ICP	Meter	SAP Pressure (kPa)	Registry Pressure (kPa)	SAP Pressure Factor	Registry Pressure Factor	Difference
1002069575QTCC1	R000049651	700	7	7.908	1.069	-639.7%
0000252761QTA48	250818	1.5	2.75	1.015	1.027	1.2%
1001273463QTB55	14EG1860	2.75	7	1.027	1.069	3.9%
0000128381QT4BE	10M377784	2.5	7	1.025	1.069	4.2%
0075001502PG96E	M217809	3.5	35	1.035	1.345	23.1%

I also requested a list of ICPs which had pressure discrepancies identified by Contact during the audit period. 25 discrepancies resulted in differences over the maximum permissible pressure factor errors allowable under NZS 5259:2015. Corrections were processed as discussed in **section 3.5**.

ICP	Meter	SAP Pressure (kPa)	Registry Pressure (kPa)	SAP Pressure Factor	Registry Pressure Factor	Difference
0001019264NGED0	01B305612	3.5	35	1.0345	1.3454	30.05%
1000550410PG0E9	21302418	3.5	35	1.0345	1.3454	30.05%
0004009072NG346	96EW0308	3.5	35	1.0345	1.3454	30.05%
0009000830NGC4F	85S5612734	20	35	1.1974	1.3454	12.36%
0002253791QT68D	274333	1.5	7	1.0148	1.0691	5.35%
0001031072NGB38	18J932072	2.75	7	1.0271	1.0691	4.08%
1002063308QTE81	R000041731	2.75	7	1.0271	1.0691	4.08%
1001260694QT68E	99A218071	2.75	7	1.0271	1.0691	4.08%
0054229744PGFF9	02EW10205	1.2	3	1.0118	1.0296	1.76%
1000516576PG9C7	07P1888	1	2.5	1.0099	1.0247	1.47%
0000321481QTFC4	834107220	1.5	3	1.0148	1.0296	1.46%
0004212851NGD07	01EW6773	1.5	3	1.0148	1.0296	1.46%
0004212569NGDE3	4GM34865	1.5	3	1.0148	1.0296	1.46%
0075003060PG05E	92E4434	1.2	2.5	1.0118	1.0247	1.27%
0001922650PG98A	G793817	1.2	2.5	1.0118	1.0247	1.27%

ICP	Meter	SAP Pressure (kPa)	Registry Pressure (kPa)	SAP Pressure Factor	Registry Pressure Factor	Difference
0000168791QT987	253725	1.5	2.75	1.0148	1.0271	1.22%
0000203811QT2CE	256352	1.5	2.75	1.0148	1.0271	1.22%
0000235311QT52C	19EG4553	1.5	2.75	1.0148	1.0271	1.22%
0002178961QTA08	19EG4593	1.5	2.75	1.0148	1.0271	1.22%
0004203096NGE6E	00EW2058	3	1.5	1.0296	1.0148	-1.44%
0001104130PGE04	79S6160264	65	62	1.6415	1.6119	-1.80%
0002316901QT7B8	R000049655	7	2.5	1.0691	1.0247	-4.15%
0000022618GN69F	20190080	15	1.25	1.1480	1.0123	-11.82%
1001129904QTDE7	13EG1433	25	2.5	1.2467	1.0247	-17.81%
0001441155QT763	19EG1623	70	7	1.6908	1.0691	-36.77%

Non-Conformance	Description	Audited party comment
Regarding: Rule 28.2 Control Rating: Adequate	30 ICPs had pressure discrepancies which resulted in differences outside the maximum permissible errors allowed in NZS 5259:2015.	Response: Contact has resolved this backlog of discrepancies – including corrections to ensure all adjusted volumes are settled appropriately. We have also put in place a monthly process to ensure we correct any new exceptions as identified via a registry vs settlement mismatch report in a timely manner. Comments: • Contact is concerned about the backdated corrections of meter pressure by meter providers where pressure factor checks identify historical errors. Retailers such as Contact are not being advised prior to these back dated registry updates that also impact multiple retailers where switching has occurred within the affected period. We recommend the GIC discuss with meter providers a more appropriate mechanism to notifying affected retailers of any historic meter pressure errors.

Meter numbers and digits

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

The meter number is stored in the hand-held device. If the meter reader's hand-held device is expecting more digits than the number of dials, then the reading is entered as normal and notification is made in the "readers notes" field for investigation. If the hand-held is expecting fewer digits than the number of dials, then the reading is entered into the "readers notes" field and once again an investigation is conducted.

I compared the SAP metering information as at 15/07/20 to the registry list as at 08/07/20, and found:

- 22 meter digit discrepancies not relating to TOU metering or metering which was removed on the registry. 18 discrepancies were corrected and four were under investigation.
- 1,245 meter serial number discrepancies not relating to TOU metering or metering which was removed on the registry. A sample were checked, and I found that Contact's records were correct.

Meter multipliers

I compared the SAP metering information as at 15/07/20 to the registry list as at 08/07/20 and found no meter digit discrepancies except those relating to TOU metering, or metering which was removed on the registry.

Meter types and content codes

I compared the SAP metering information as at 15/07/20 to the registry list as at 08/07/20 and found four ICPs where the TOU flag was set to Y and the allocation group was 4.

ICP	Contact supply start date	Contact supply end date	Comment
0000953421QTD8B	01/07/18	-	Still supplied by Contact as non-TOU AG4
1001133052QTBC8	01/07/08	-	Still supplied by Contact as non-TOU AG4
0000298891QTFA0	22/11/17	30/09/20	Switched out effective 01/10/20, last supplied by Contact as non-TOU AG4
0000322631QT591	05/04/17	21/05/20	Switched out effective 01/10/20, last supplied by Contact as non-TOU AG4

TOU ICPs consuming under 10,000 GJ pa are sometimes read and settled as non-TOU. This is recorded as non-conformance in **section 3.2**.

Recommendation	Audited party comment
Identify any ICPs where register content codes, the TOU metering flag and metering details are inconsistent, to confirm which values are correct. Any ICPs which genuinely have TOU metering should be settled as TOU.	Response: Contact does not agree with this interpretation of the regulations around TOU metering flag for ICPs under 10 TJ. The purpose of a corrector being present is due to a number of reasons such as: • The meter is operating as network or close to network pressure. • The flow rate means the regulator is not able to maintain the meter pressure within the required tolerance. • The meter design was when the ICP had significantly higher gas load and now the ICP consumes significantly lower volumes – however the costs to modify the GMS is prohibitive Most electronic corrector also include a TOU logging capability which is why the metering provider has flagged the registry accordingly. This does not mean the primary purpose of the corrector being installed is for the TOU logging capability. The Regulations were written to allow retailers to decide how to settle ICPs below 10 TJ between TOU and NHH where TOU capability was present. Comments: • We have concerns how this interpretation of the regulations will impact the settlement of gas smart meters as these should also be flagged as being a TOU device with comms. If the same logic was applied them all gas smart meters will need to be settled as Allocation group 1 ICPs

2.3 Billing Factors

2.3.1 Temperature Information

For ICPs where the actual temperature is not measured NZS 5259:2015 states that temperature may be estimated; and four methodologies are provided. These are listed below in order of decreasing preference.

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

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

At the beginning of the audit period Contact applied temperatures based on average NIWA 30-year data for all gas gates within a geographical area, which were last updated in 2016. Some of the geographical areas are large, due to difficulty in obtaining NIWA 30cm ground temperatures for all regions. ICPs were assigned to a temperature region based on their gas gate.

Contact is migrating all its ICPs to the GIC's published temperatures for each gas gate, effective from an actual meter reading. Fortnightly a query is run from SAP to identify ICPs with the old temperatures regions assigned and bulk update the "temperature area" to the new gas gate temperature effective from the last actual read date. At the time of the audit, approximately 50% of the ICPs had been migrated and the process had been slower than anticipated because of read attainment issues. Once the number of ICPs remaining is at a more manageable level, Contact intends to adjust the temperature on permanent estimates for any ICPs which have not received actual readings.

The accuracy of temperature information was confirmed by:

1. Review of the temperature region data in SAP for January 2020 to December 2020, which was found to be reasonable for all areas.

2. Comparison between the temperature data for each gas gate in SAP to the GIC's published temperature values for January 2020 to December 2020, which matched.

NZS 5259:2015 states that correction for temperature drop due to Joule-Thomson effect of pressure reduction is applicable if temperature methodologies (b), (c) or (d) are used, provided the reduction is made in the same installation and immediately upstream of the GMS. "In other cases, or for large

pressure drops or high flow rates the actual temperature drop should be measured. For natural gas the temperature drop is about 0.5º per 100kPa of pressure drop." This indicates that adjustment for the Joule-Thomson effect is desirable.

The Billing Factors Guideline contains the following expectations by GIC:

- Network owners ensure nominal operating pressures are correctly populated in the registry for all ICPs on their networks.
- Once network pressures are correctly populated, retailers ensure that they account for the Joule-Thomson effect by using the network pressure in the registry in their conversions of metered volumes to standard volume, particularly in situations where failure to do so will result in conversion errors greater than those allowed in Table 3 of NZS 5259:2015.

This also reinforces that adjustment for the Joule-Thomson effect is desirable. Contact applies the Joule-Thomson effect adjustment, and the formula was checked and confirmed to be correct.

The accuracy of the temperature factor and Joule-Thomson adjustment is dependent on correct inputs, including the temperature region (discussed above), network pressure, and gas gate. Network pressures and gas gates stored in SAP are validated against the registry, and corrections are processed where data is confirmed to be incorrect.

Network pressure

Network pressure is used as an input into the Joule Thomson adjustment, where a 0.5 degree temperature reduction is applied for every 100 kPa drop between the network pressure and meter pressure for an ICP.

Where incorrect gas network pressures are found, they are updated effective from an actual or permanent estimate read. Contact's ability to process a correction can be affected by billing locks, which "lock" attributes once they have been used to generate an invoice. To change these values, it is normally necessary to reverse bills. Contact is investigating changes which would allow the billing lock to be bypassed to process corrections independently of billing, but in the meantime network pressure corrections are not usually made from the date that the pressure took effect on the registry.

There are 24 ICPs where the network pressure and the meter pressure are the same (two of these have the "operating at network pressure" flag set to yes), and four ICPs where the network pressure is less than the meter pressure. I initially found 11 appeared accurate compared to most ICPs on the street, 11 appeared reasonable based on other nearby ICPs, and six appeared unusually low compared to other ICPs on the street. Contact is investigating these ICPs to check what the network pressure should be. A recommendation is made in Contact's registry audit report to identify ICPs where the network pressure is the same or less than the meter pressure.

Gas gate

Comparison of SAP and registry data identified 31 gas gate discrepancies relating to ICPs which underwent backdated changes from HTV11301 to HTK08301 after the ICPs switched out. The gas gates for the affected ICPs were corrected during the audit.

Gas gates recorded in SAP are retrieved from the registry. There is a known issue where an ICP which has previously been supplied switches back in, and the gas gate has changed in the meantime. SAP obtains the original values rather than the values at the time the ICP is won back.

Where incorrect gas gates are found, they are updated effective from an actual or permanent estimate read. Contact's ability to process a correction can be affected by billing locks, which "lock" attributes once they have been used to generate an invoice, such as the CV region. To change these values, it is normally necessary to reverse bills. Contact is investigating changes which would allow the billing lock to be bypassed to process corrections independently of billing.

The gate discrepancies did not cause any differences outside the maximum permissible error under NZS 5259:2015. HTV11301 and HTK08301 are part of the Greater Hamilton gas gate, so there is no impact on the seasonal adjusted shape values used to calculate historic estimates for reconciliation. The temperatures applied by Contact for conversion were the same for both gates.

Recommendation	Audited party comment
Ensure that inputs into the gas conversion process are correct: Continue with work to investigate the bypassing of billing locks for inputs into the gas conversion process for reconciliation data including gas gate, altitudes, and pressures, to allow conversion factors to be applied for the correct date range. Review processes to ensure the correct gas gate is assigned for: 1) Backdated changes to gas gate information during Contact's period of supply for ICPs which have switched out or been decommissioned, to ensure that reconciliation revision submissions are correct. 2) ICPs which have previously been supplied which switch back in.	Response: Correct inputs to the gas conversion process We have implemented additional and regular exception reporting around network pressures being lower than meter pressure and we have escalated a number of ICPs to the respective distributor for investigation and correction. Backdated Network attributes impacted by billing locks: A proposed system enhancement to enable controlled backdated updated to network attributes has been submitted to our project council for consideration and approval. We are also continuing to investigate how to improve our capture of correct registry attributes where we win back an ICP previously supplied by Contact where the network attributes have changed.

2.3.2 Calorific Values

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

The appropriate gas composition values for each ICP are determined by the gas gate, which in turn links to the gas type and a table of daily gas composition values for that gas type. Because gas

composition data is not published until 10am each weekday for the previous week day and/or weekend days, SAP populates three years of forward dated gas composition data based on the last day of published values for each gas type. This allows meter readings to be billed on the day they are received if necessary.

From 20/08/19 until 26/07/20, gas composition data was not successfully imported into SAP. There was an automated process to retrieve the gas composition data, which was not restarted following a system upgrade. SAP's automated process to import the data continued to attempt to run, but no data was found. Contact's exception (BPEM) process only reported instances where gas composition data was missing; and were not triggered because forward dated gas composition data was available.

The error was discovered when gas composition information was requested for this audit. Contact took immediate action to download and import the correct gas composition information, determine the impact, and advise the Gas Industry Company. I checked gas composition data for all gas types against OATIS data following the change and confirmed it had been updated.

Once billed, the gas gate (which determines the gas composition region) is "locked" for that read to read period and cannot be changed unless the bill is reversed. The gas composition values stored against the gate for each day are not locked and are applied for revision submissions. This allowed data to be corrected for revision submissions without reversing all invoices.

The issue affected all gas gates, and the difference between the forward dated values applied for conversion and actual values varied depending on the gas type and read to read period. Contact completed analysis to determine whether the difference between the calorific values applied was more than the ±0.5% maximum permissible error for calorific values allowed under NZS 5259:2015.

- Contact's analysis based on the percentage difference between applied and actual calorific values for annualised consumption was -0.31% across all gas gates. Potential differences over ±0.5% were identified for gas types B (-1.08% 1,914.491 GJ), E (-1.99% -1,625.294), U (6.2% 91.889 GJ) and M (+0.62% +9.539 GJ).
- Meter level read to read period analysis was provided for two has gates, which confirmed that the high-level analysis based on annualised consumption gave a reasonable indication of the impact of the issue. This detailed analysis showed that for some periods, differences were over the ±0.5% maximum permissible error allowed under NZS 5259:2015.

Temporary controls were implemented to prevent recurrence of the issue until system changes were implemented:

1) The billing team performs a weekly check to confirm that gas composition data is updated.
2) The reconciliation manager completes ad hoc spot checks between the gas composition data and OATIS.

Contact provided testing documentation for a new gas calorification test report which became live on 22/10/20. The report identifies values above or below expected thresholds and that actual values are present for the previous 31 days. The process generates emails to the reconciliation team, billing team and operations support.

Non-Conformance	Description	Audited party comment
Regarding: Rule 28.2 Control Rating: Adequate	From 20/08/19 until 26/07/20 gas composition data in SAP was estimated based on the last value recorded, when actual data was available, resulting in some calorific values outside the maximum permissible error allowed under NZS 5259:2015. Correct gas composition data has been loaded into SAP, and revised volumes will be washed up. Additional controls over the process have been implemented.	Response: It was disappointing that our controls did not identify a failure in our capture of OATIS gas properties data. We did identify and resolve this issue in time to ensure we have put the market right in terms of correct settlement volumes as part of our 13 month final submissions. We agree with the auditor's assessment of impact for the 4 gas types. In addition to the correction of our settlement volumes we have implemented additional system and manual controls to ensure the failure of our data capture process from OATIS does not occur again

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

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

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

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

Allocation groups are recorded on the registry and in SAP's time slices. Allocation groups are normally updated on the registry effective from the beginning of a month, and then imported into SAP. Where an allocation group change occurs part way through a read to read period, consumption is apportioned using a flat line method based on the number of days. If there are no actual readings for an extended period, a permanent estimate reading will be entered on the change date.

I compared the allocation group and profile codes on the registry for all ACTC and ACTV ICPs on the registry list as at 08/07/20 and did not identify any discrepancies.

All ACTC and ACTV ICPs had a value recorded in their allocation group on the registry. Allocation groups are assigned based on the expected or actual annual load for the ICP. Reports are run at least quarterly to identify all allocation group 4 ICPs and their consumption, and all allocation group 6 ICPs with consumption over 250 GJ.

Allocation group 6 ICPs are on a two monthly reading cycle and allocation group 4 ICPs are on a monthly reading cycle. ICPs are not moved between allocation groups until their read cycle has been updated. This is primarily to allow the ICPs to be tracked, because if an ICP is in allocation group 6 with consumption under 250 GJ it will not appear on the validation reports. If an ICP's consumption fluctuates around the threshold it is left as allocation group 4.

The July 2020 analysis by Contact found the following:

- six allocation group 6 ICPs had estimated annual consumption exceeding 250 GJ; all were corrected to allocation group 4 prior to the audit, and the corrections were delayed by waiting for the ICPs' meter reading schedules to be updated,
- four allocation group 4 ICPs had estimated consumption under 250 GJ per annum; one was corrected to allocation group 6 prior to the audit, and three were close the threshold and remained in allocation group 4 to be conservative, and
- there were no allocation group 4 or 6 ICPs with estimated consumption over 10,000 GJ per annum.

I checked compliance with the requirement to obtain readings for allocation group 4 customers at least monthly by reviewing a list of last actual read dates for gas ICPs as at 14/07/20. 1,129 (82.5%) of the 1,368 allocation group 4 ICPs on the list had a last actual read date in June or July 2020. The other 239 ICPs had last actual readings between August 2018 and May 2020, and 212 of those had an actual reading within the last 12 months. I discussed the reasons readings were not obtained with Contact, and found it was predominantly due to meter access issues, including meter readers attending the sites early in the day before the business was open, or being unable to locate the meter, or gain access.

I compared the SAP metering information as at 15/07/20 to the registry list as at 08/07/20 and found four ICPs where the TOU flag was set to Y and the allocation group was 4. All consumed less than 10,000 GJ per annum but had correctors installed. They were expected to be submitted as TOU allocation group 2 ICPs because telemetry is not installed.

ICP	Contact supply start date	Contact supply end date	Comment
0000953421QTD8B	01/07/18	-	Still supplied by Contact as non-TOU AG4
1001133052QTBC8	01/07/08	-	Still supplied by Contact as non-TOU AG4
0000298891QTFA0	22/11/17	30/09/20	Switched out effective 01/10/20, last supplied by Contact as non-TOU AG4

ICP	Contact supply start date	Contact supply end date	Comment
0000322631QT591	05/04/17	21/05/20	Switched out effective 01/10/20, last supplied by Contact as non-TOU AG4

Recommendation	Audited party comment
Update ICP allocation groups as soon as practicable, instead of waiting for the meter reading schedule to be updated.	Response: We have implemented this recommendation into our process.

Non-Conformance	Description	Audited party comment
Regarding: Rule 29.2 Control Rating: Adequate	ICPs 0000953421QTD8B (01/07/08 onwards), 1001133052QTBC8 (01/07/08 onwards), 0000298891QTFA0 (21/11/17 - 30/09/20), and 0000322631QT591 (05/04/17 - 21/05/20) have TOU metering and consume more than 250 GJ pa but have allocation group 4 assigned.	Response: Contact does not agree with this interpretation of the regulations around TOU metering flag for ICPs under 10 TJ. The purpose of a corrector being present is due to a number of reasons such as: • The meter is operating as network or close to network pressure. • The flow rate means the regulator is not able to maintain the meter pressure within the required tolerance. • The meter design was when the ICP had significantly higher gas load and now the ICP consumes significantly lower volumes – however the costs to modify the GMS is prohibitive Most electronic corrector also include a TOU logging capability which is why the metering provider has flagged the registry accordingly. This does not mean the primary purpose of the corrector being installed is for the TOU logging capability. The Regulations were written to allow retailers to decide how to settle ICPs below 10 TJ

Non-Conformance	Description	Audited party comment
		between TOU and NHH where TOU capability was present. Comments: We have concerns how this interpretation of the regulations will impact the settlement of gas smart meters as these should also be flagged as being a TOU device with comms. If the same logic was applied them all gas smart meters will need to be settled as Allocation group 1 ICPs
Regarding: Rule 29.4.2 Control Rating: Adequate	239 allocation group 4 ICPs did not have actual meter readings recorded in the previous month as at July 2020.	Response: Group 4 ICPs which had been inadvertently added to Bi Monthly read rounds have been updated to monthly rounds. We have also introduced a monthly reconciliation process to capture new switched-in sites ensuring that they are added to the monthly read round as well. With access issues, we have introduced adding business opening time hours onto meter reader location notes to help with gaining reads and better information to be provided related to confined spaces. An additional review relating to gas meter installations which are deemed to be too high for a safe read by one person is currently ongoing, as a special read round (two person) may have to be introduced to meeting current meter reading requirements. Future proofing: installation of gas smart meters on Group 4 sites would greatly reduce our non-compliance and discrepancies.

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

Each month, retailers must report the number and percentage of validated meter readings obtained in accordance with rules 29.4.3 and 29.5 in the GAS080 report. The GAS080 report is created by SAP. I checked the GAS080 against ICP level read attainment information and it appeared reasonable.

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

For non-TOU meters, the Automated Meter Reading Compliance (MRC) process applies. The process begins 130 days after an estimated read is entered, so ICPs supplied for shorter periods do not usually have any action taken, and the best endeavours requirement is unlikely to be achieved. The MRC process has the following steps:

- process initiation occurs on the day an estimated reading is entered,
- letter 1 is sent if the process is still active after 130 days,
- letter 2 is sent if the process is still active 70 days after letter 1 was issued,
- letter 3 is sent to advise that there are charges if a high priority read is requested,
- request a high priority (out of cycle) meter reading if the process is still active 70 days after letter 2 is issued, and
- a BPEM is raised if the process is still active 60 days after the high priority read is requested, the user attempts to gain a read and enter a permanent estimate if an actual reading cannot be obtained.

The MRC process is terminated when the customer switches out, is disconnected, an actual reading is received, or they are added to a meter reader exclusion list (due to a health and safety issue or not being allocated to an active meter reading route).

Following the transition to MRS in July 2019, resourcing issues resulted in poor read attainment in some areas. To avoid sending letters to customers where reads should have been able to be obtained, no access letters were put on hold in December 2019 and have not been issued since. All open meter read compliance activities were cancelled on 23/01/20 and the process was restarted on the first estimate following 23/01/20 for each affected ICP. The process was also modified for COVID-19 to explain that Contact would not be reading meters during the lockdown; and encourage customers to supply their own readings where possible.

Contact's reconciliation team continues to monitor read attainment though review of the GAS080 report and monitoring of UFG, and issues are followed up with MRS. Contact has been working with MRS to improve read attainment. MRS has made changes to their processes and staffing to lift performance, and Contact has requested they target high priority ICPs (including allocation group 4) to minimise the impact of the read attainment issues.

To confirm compliance with the meter reading frequency rules, Contact provided a copy of the GAS080 report for March 2020 to May 2020.

Target	Rolling 4 months (target 90%)	12 months (target 100%)
Mar 2020	87.62%	99.02%
Apr 2020	87.60%	99.19%
May 2020	89.34%	99.38%

Contact provided lists of ICPs unread in the previous four months and 12 months as at 14/07/20 for review.

- Compliance with the 4-month reading target (29.4.3) was not achieved. I checked a sample of ten ICPs that were unread in the four months ending July 2020. The ICPs were unread due to a combination of unresolved access issues, MRS resourcing and scheduling issues, and periods where meter reads could not be attempted due to COVID-19 lockdowns. I have taken into consideration that exceptional circumstances existed for at least part of the period for each ICP because of the COVID-19 alert level three and four lockdowns which ran from 26/03/20 to 13/05/20.

- Compliance with the 12-month reading target (29.4.2) was checked using the GAS080, GAS080 ICP level detail, and a list of ICPs known not to have received an actual read for the last 12 months. I checked a sample of ten ICPs that were unread in the 12 months ending July 2020. Nine ICPs were unread due to access issues which Contact had attempted to resolve, and one ICP was unread due to MRS resourcing and scheduling issues. COVID-19 lockdowns made up a small portion of the 12-month period, and I have considered that exceptional circumstances did not exist for ICP 0000593531QT85C, unread due to MRS resourcing issues.

- I checked compliance with the requirement to obtain readings for allocation group 4 customers at least monthly in **section 3.2**.

Contact also provided correspondence with the Gas Industry Company from November 2019, indicating that they had unintentionally breached the meter read attainment requirements between July 2019 and November 2019. Read attainment declined because Contact's new meter reading supplier from July 2019 experienced some resourcing issues, and had difficulty meeting Contact's system requirements. Contact and MRS have continued to work together to resolve these issues. Read attainment has been improving over time, with the exception of COVID-19 lockdown periods.

Non-Conformance	Description	Audited party comment
Regarding: Rule 29.4.3 Control Rating: Adequate	Exceptional circumstances not demonstrated for one ICP not read in the 12 months ending July 2020.	Response: From November 2020 all MRC activities including letter correspondence to customer commenced as well as generating high priority read request for ICPs not read within the past 365 days. But we acknowledge that the read attainment levels during 2020 have not been at an acceptable standard due to MRS resourcing issues as well as restraints to enter properties during Covid-19 lockdowns, this is what led to the decision to withhold sending the customer letters (purely because the letter content relates to accessibility not meter reader performance). However, for many customers that were identified as having long term sequential estimate reads, we did send an ad-hoc e-mail where possible, identifying the reading issues and gave them information on
Regarding: Rule 29.5 Control Rating: Adequate	The meter reading attainment requirements were not consistently met between July 2019 and November 2019.	

Non-Conformance	Description	Audited party comment
		how they can provide a read to ensure their current estimate read was accurate for billing purpose.

3.4 Non TOU Validation

Meter reading validation occurs at multiple levels.

Meter reader validation

For meters manually interrogated by MRS, a validation within their hand-held device identifies readings outside specified high/low parameters and prompts the reader to check the reading.

MRS also check the condition of the meters, to identify issues that could affect meter accuracy or safety. If an issue is identified, the appropriate condition code is entered into the hand-held device and provided to Contact. The meter condition information is imported into SAP and used to create BPEM (Billing Process Exception Management) events, which are directed to work queues in SAP for investigation and action.

Read import and billing validation

Contact's file import process identifies any file errors or corruption and creates an exception. Once successfully imported, the billing validations identify any consumption outside prescribed limits and creates an exception. A summary of the validations is set out below:

Validation type	Description
Implausible reads	High consumption Extra high consumption Low consumption
Negative consumption	Negative consumption
Zero consumption	Zero consumption for the previous month
Vacant and disconnected consumption	Vacant consumption >0 units Disconnected consumption >2 units
Billing period	Short or long bill period
Bill value	Billed dollar value outside of tolerance

When exceptions are created, they are assigned to users or robots (Bots) as BPEMs. Bots primarily process implausible read, zero consumption and bill value exceptions, and approve them based on a set of rules or request a control read. For instance, if an implausible read is the first reading after a

switch gain read the Bot will issue a request for a control (out of cycle) meter reading. Users can check readings against the MRS portal, which contains MRS read history and meter photographs.

Contact has identified some instances where Bots are unexpectedly invalidating, releasing or modifying readings, for example:

1. All control (out of cycle readings used to confirm whether an implausible read is accurate) are intended to be reviewed by a user. The Bots have released the implausible and control readings where they are found to be consistent. This often leads to high bill exceptions, which are not processed by the Bots.

2. Bots have unexpectedly updated readings where consumption during inactive periods has occurred, invalidated actual readings, and added estimated readings.

3. Bots have unexpectedly released readings where disconnection or reconnection is in progress.

These issues have been raised with Contact's automation team and are under investigation. The scenarios are discussed in more detail in **section 3.5**.

Exceptions not validated by the Bots and returned control readings (except where they have been unexpectedly validated by the Bots) are directed to work queues. Users investigate each exception, starting with the oldest and highest priority exceptions. If an exception is not resolved on the first day because it requires further investigation, the BPEM will remain until it is resolved. If a BPEM will require later follow up (such as when a control read is requested), the user can set the BPEM status to pending and specify a number of days, after which time the BPEM will reappear in the user's main queue. This process helps to prevent double handling.

Each type of exception is assigned to four or five primary users, to ensure that several team members are familiar with the process to cover absences. Another two users are being trained to allow better coverage during staff absences. The Operations Team Leader (Billing) monitors overdue service orders and BPEMs and the total number of service orders and requests daily; and takes action to follow up and redistribute tasks if required. Summary reporting of open service orders, performance and workloads is reviewed weekly.

Upon changing meter read providers to MRS there was a drop in read attainment and control read attainment due to resourcing issues. Reads were estimated for several months for some ICPs, which caused an increase in the number of implausible read exceptions once reads were received. Read attainment is also still affected by COVID-19 but is expected to continue to improve, and control reads are able to be obtained to aid read validation.

Contact uses reports to identify ICPs with zero consumption for more than 90 days. Because gas consumption can be seasonal where it is used for heating only, Contact usually reviews the reports annually in spring. The review was last completed in Spring 2019, the next review is expected to commence soon. Contact reviews each ICP on the report individually; and will contact the customer to determine whether the zero usage is valid and arrange a field services job to investigate if necessary. If a meter fault is confirmed, the meter will be replaced and correction to estimate consumption during the faulty period will be completed as described in **section 3.5**.

Recommendation	Audited party comment
I recommend that the Bot read validation processes are reviewed, and corrective action is taken if the processes are not consistently operating as intended. Issues have already been identified by Contact for the following validation processes: • treatment of returned control readings, which have been released by Bots although they are required to always be reviewed by a user, • treatment of inactive consumption, including misclassification of actual readings, and • release of readings where disconnection or reconnection is in progress.	Response: Contact will investigate processes and systems associated with the recommendations and look to implement suggested improvements where practical.

3.5 Non TOU Error Correction

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

Stopped or faulty meters

ICPs with stopped or faulty meters are usually identified through the NHH validation process described in **section 3.4**, or reported by the customer, meter reader, or meter owner. When a potential fault is identified, the meter is checked and replaced.

A spreadsheet template is used to estimate consumption in situations where meters are determined to be recording incorrectly or are stopped. The template uses historic consumption from periods prior to the fault, or consumption recorded by a replacement meter after the fault. Correction activity is conducted by a limited number of experienced staff in the revenue assurance and reconciliation teams to ensure accuracy and consistency.

The correction is then processed in SAP by:

- reversing the bill, correcting the readings, and rebilling,
- adding consumption to an existing reconciliation period record, which allows the change to be independent of billing to the customer if necessary, and
- where a meter is stopped, faulty, or bridged, Contact can close the meter on an estimated closing read which includes the unrecorded consumption and restart the meter on the correct read.

For each of the correction methods the consumption will flow through to reconciliation submissions. Correction occurs within the 12-month period if the period affected is longer than 12 months. This ensures all consumption is accounted for.

Contact provided a list of four potentially faulty meters:

- 0002073041QT5D8's meter was checked and confirmed not to be faulty,

- 0001010164NG173 and 0048101450PGA92 have had field services jobs open since July 2020, and completion paperwork has not been received by November 2020, and
- 0000059861QT27F has stopped recording volumes, and an estimate of consumption during the faulty period was accurately calculated and applied in SAP.

I recommend that field services jobs for faulty meters are more closely monitored and followed up if paperwork is not received so that issues can be resolved, and corrections processed as soon as practicable. Most gas contractors do not use Contact's ORB system, and paperwork is usually returned via email and then updated in ORB by Contact's Gas Help Desk.

Recommendation	Audited party comment
Improve monitoring of field services jobs, to ensure that field service visit results are promptly received and reviewed, and corrective action can be taken if necessary.	Response: Contact will investigate processes and systems associated with the recommendations and look to implement suggested improvements where practical.

Meter pressure corrections

Meter pressure in kPaG is stored against the meter in a static field in SAP. SAP's gas conversion process applies the meter pressure value at the time of billing. Once billed, the pressure value is "locked" for that read to read period and cannot be changed unless the bill is reversed.

When pressure changes coincide with a physical meter change, the new pressure will be loaded on the new meter and correctly applied. Where pressure changes are backdated corrections, or physical changes which do not coincide with the meter change, the process varies depending on whether the correct pressure is higher or lower than what has been recorded in SAP.

1. If the correct meter pressure is higher than what was recorded in SAP, SAP will be adjusted effective from day after the last invoice date. The reconciliation team will process an adjustment to the submission records for any periods prior to the last invoice date and will ensure that the full correction is captured within the 12-month period.
2. If the correct meter pressure is lower than what was recorded in SAP, bills will be reversed for all affected customers and the correct pressure will be applied from the pressure change date. If the correction is backdated more than 12 months, the reconciliation team will adjust submission records to ensure that the full correction is captured within the 12 month period.

The previous audit found that Contact only processed pressure corrections where the difference was more than ± 1.5% across all factors. This limit has been removed and all pressure differences are corrected.

Error correction was examined by conducting a walk-through of the process and by examining 27 ICPs with pressure discrepancies between SAP and the registry, including 25 with pressure differences which resulted outside the thresholds allowed in NZS 5259:2015 and two differences which were below 1 kPa.

- 26 of the corrections were appropriately processed in SAP from the correct date for reconciliation, and corrected volumes were provided to the reconciliation manager. Where the correction affected a period longer than a year, all volumes were captured within 12 months.
- For ICP 0001441155QT763 the meter pressure was recorded as 70 but should have been seven. Because there was a delay in processing the correction the affected period was more than 12 months prior, negative submission volumes were created because there was insufficient consumption to offset the correction against. Contact submitted zero for the ICP, because the reconciliation manager's system does not allow negative consumption to be submitted.

I note that some of these corrections had not been completed as part of Contact's business as usual processes and were completed as part of review of data exceptions during the audit. As for stopped and faulty meters, I found that there were sometimes delays in investigating pressure differences and processing corrections. Meter pressure discrepancies can result in gas conversion factors outside the allowable thresholds.

Recommendation	Audited party comment
Improve the timeliness of identification and correction of meter pressure discrepancies.	Response: We have implemented this recommendation into our processes

Inactive status corrections

Consumption is only included in submission where the settlement unit in SAP has an "active" status. The meter read validation process creates a business process exception (BPEM) where consumption during a disconnected period occurs. BPEMs are directed to work queues where staff investigate to determine whether the consumption is genuine or is caused by a misread; and take corrective action.

Contact provided a list of 62 ICPs which had inactive consumption from July 2019 onwards, which I reviewed:

- 25 ICPs had incorrect settlement unit records, which were identified and corrected through the reconciliation team's pre submission validation and system defect 47292, which resolved issues preventing some settlement units from automatically refreshing. I checked a sample of five records and confirmed that they were resolved by refreshing the settlement units for the affected ICPs.
- 17 ICPs were indicated to have incorrect reads and/or read dates recorded in SAP. Where consumption is recorded between a disconnection and reconnection read, or the read date entered does not align with the disconnection or reconnection date, consumption may be recorded in an inactive period. I checked a sample of five of these ICPs and found that they were corrected by correcting the disconnection read or read date. The reads were recorded as actual where they had initially been entered incorrectly, and permanent estimates in other cases.

- Four ICPs appeared to be reconnected, but the inactive settlement unit was not end dated. They were corrected by processing the reconnection and end dating the inactive settlement unit.

  There are sometimes delays in processing reconnections for long term disconnected ICPs. If a gas installation has been disconnected for more than six months and no certification is provided to confirm that the gas supply is safe and the owner of the installation is unable confirm that no gas fitting work has been undertaken since the supply has been disconnected, the contractor will not reconnect the ICP until the installation has been tested. Typically, this testing is completed by the customer's own gasfitter who is expected to leave the ICP disconnected, so that Contact can reconnect. In some cases, the gasfitter leaves the supply connected after completing their testing and Contact only becomes aware that the reconnection is completed when an inactive consumption BPEM is created. The BPEMs are escalated to the field services team who confirm that the ICP has been connected and is safe, and then the registry and SAP are updated.

- Three ICPs had estimated disconnection or reconnection reads, which were corrected to remove the consumption from the inactive period.

- Three ICPs had disconnection or reconnection boundary reads which were modified by the Bot validation processes, creating inactive consumption. The Bot had determined that the readings were implausible because there was consumption during an inactive period. The audit trail notes stated that the robot had updated the disconnection read to match the earliest subsequent actual read to remove the consumption from the disconnection period, but instead the process had changed a reading from actual read type 01 actual, to 05/03 re-estimated after over estimation. The reconciliation team have asked for this automated process to be suspended.

- Two ICPs had scheduled readings which were believed to be misreads, creating invalid inactive consumption. 1001116133QTF94's read type was updated to be a misread. ICP 0002382397QT29E (inactive from 08/06/20) had an open BPEM and was under investigation at the time of the audit, pending confirmation of whether the read recording consumption was a misread.

- The reconnection for 0002118731QT653 was partially processed. Reconnection paperwork was received indicating that a reconnection was attempted but not completed due to a leak on the customer side of the meter. Contact was waiting for confirmation that the issue was resolved before the ICP was reconnected in SAP and the registry, and MA04 BPEM was created to track this. In the meantime, a Bot released the reading provided with the original reconnection paperwork which closed the MA04 BPEM without the disconnection document being closed and settlement units being updated. The reconciliation team have raised the issue with the automation team.

- One ICP had inactive consumption relating to a creeping meter. Contact provided paperwork confirming that the meter was disconnected and capped. The meter has registered a maximum of one CM of gas per three months while disconnected. Based on the volume and disconnection paperwork, I agree that the meter appears to be creeping rather than

reconnected. I recommend that a procedure is developed to identify and manage creeping gas meters.

- Six ICPs had genuine consumption during inactive periods, which was not caused by inaccurate disconnection or reconnection reads, misreads, or estimates. Typically Contact waits until two actual readings confirming consumption have been received before processing a correction by adding boundary readings, updating the ICP status and refreshing the settlement units. Corrections were processed for five ICPs and further correction is required for ICP 0000060471QT952. The ICP had a correction processed which excluded consumption between 28/05/20 and 29/06/20, and a further correction is to be completed.

Contact is investigating a process change which would allow SAP to include any consumption during inactive periods in reconciliation submissions. SAP generates consumption for all periods, but only includes it in submission where the settlement unit is active.

Recommendation	Audited party comment
Develop a procedure to manage creeping meters. As part of this process Contact should check paperwork to confirm that the ICP was successfully disconnected and set a threshold for maximum expected consumption for meter creep. If the consumption is above the threshold, I recommend investigating to determine whether the ICP has been reconnected and taking corrective action as required.	Response: We are looking to amend our consumption on inactive sites monitoring procedures to include a step to investigate possible creeping meters and if this is the case then remove the meter from the site.

Non-Conformance	Description	Audited party comment
Regarding: Rule 26.2 Control Rating: Adequate	The correction for inactive consumption for ICP 0000060471QT952 excluded consumption between 28/05/20 and 29/06/20, and a further correction is to be completed.	Response: We have now corrected the issue for this ICP and the settlement volumes will be included in the respective wash ups

3.6 TOU Validation

Contact has not supplied any AG1 or AG2 ICPs since 30/04/2020. The registry list as at 08/07/20 identified four ICPs where the TOU flag was set to Y and the allocation group was 4. All consumed less than 10,000 GJ per annum which had correctors installed and are settled as non-TOU. This is recorded as non-conformance in **section 3.2**.

SAP validates TOU data and creates BPEMs for review and action where exceptions are identified. I viewed the list of BPEMs for TOU data which included validation of high, low and zero:

- corrected volumes
- uncorrected volumes

- pressures, and
- temperatures.

GAS050 submissions are validated prior to being submitted to the allocation agent, including comparison of consumption to previous months and revisions as discussed in **section 5.2**.

4. Energy Consumption Calculation (Rule 28.2)

To evaluate energy consumption calculations, a spreadsheet was prepared which converts volume between meter readings to volume at standard conditions and then to energy consumption. The relevant information for some TOU and non TOU ICPs was entered into the spreadsheet and the resulting energy value was compared to that calculated by SAP.

TOU Energy Consumption Calculation

Raw TOU data is converted to energy within SAP. All TOU meters supplied by Contact had TG (temperature and gauge pressure corrected) register content codes.

- An altitude factor is calculated for all TOU ICPs and applied in the conversion process where the register content code is not TA.
- A compressibility factor is calculated and applied for all TOU ICPs where the register content code is not TGS and pressure is above 50 kPa, otherwise a compressibility factor of 1 is applied.
- Pressure and temperature factors of 1 are applied for all TOU ICPs, because the data is already corrected for temperature and pressure.
- Daily calorific values are applied.

Because all ICPs supplied had TG register content, I checked the TOU conversion process by reperforming the conversion process for one ICP. The factors and total result were within the maximum permissible errors set out in NZS 5259:2015.

Non TOU Energy Consumption Calculation

SAP applies gas conversion factors to convert data from CM to energy:

- the temperature factor includes a Joule Thomson adjustment, which allows a 0.5º temperature drop per 100 kPa of pressure drop between the network pressure and meter pressure, and as discussed in **section 2.3.1**, ICPs are being migrated from Contact's existing regional temperatures to the Gas Industry Company's published gas gate temperatures.
- a compressibility factor is calculated and applied for all ICPs where pressure is above 50 kPa, otherwise a compressibility factor of 1 is applied,
- pressure and altitude factors are applied by SAP for all non TOU ICPs, and
- average calorific values for the read to read period are applied.

It was difficult to obtain information on the individual conversion factors in SAP, as these are not viewable in the front end. It was necessary to step through SAP's code in stages to determine the factor values. I checked the non TOU conversion process by reperforming the conversion process for a sample of five ICPs and seven read to read periods with different meter pressures, network pressures, gas gates, and altitudes. I was able to check the following information against my manual recalculation:

- the temperature factor,
- the compressibility factor,

- application of gas composition values, and
- the total gas volume.

I confirmed that the pressure factor and altitude factor were included in the gas conversion factor, but not individually itemised. The calculation of these factors was split and bundled in with other parts of the calculation, so I was unable to perform a clean comparison between the individual factor value and a manual recalculation based on NZS 5259:2015. To confirm compliance, I checked the total conversion factor and energy calculated against my manual recalculation and found in all cases that the difference was well below the minimum of the maximum permissible errors for any individual factor. Based on this, I believe that the application of the altitude and pressure factors by SAP is correct.

If any inputs into these calculations are incorrect, including SAP static data, errors will occur. An incorrect altitude for one ICP, pressure discrepancies for 30 ICPs, and application of estimated calorific values resulted in differences outside the maximum permissible errors allowed in NZS 5259:2015. This is recorded as non-conformance in **sections 2.1.2**, **2.2** and **2.3.2.**

I recommend that Contact considers a change to allow conversion factor information to be viewed in SAP's front end, which will allow more efficient investigation of any future gas conversion issues and processing of corrections relating to conversion factors, as well as assisting with audits.

Recommendation	Audited party comment
Consider displaying a breakdown of conversion factors for each read to read period in SAP's front end, including: • temperature factor (and temperature applied), • compressibility factor, • pressure factor (and pressure applied), • altitude factor (and altitude applied), and • calorific value.	Response: We have submitted a proposed system enhancement to capture and store the individual factors to our project council for consideration and funding approval.

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.

SAP creates estimates if data is missing, which usually occurs because the meter was unable to be downloaded in time for submission, or there has been a corrector or battery failure.

Estimates are calculated based on uncorrected readings surrounding the period to be estimated (if available) with fixed factors for a similar period applied for conversion. Volumes are apportioned between days based on the same weekday and time of year the previous year if available, or the previous week. If surrounding readings are not available, estimates will be calculated based on the data for a similar period.

Contact did not create any temporary or permanent estimates between July 2019 and when their last TOU ICP switched out from May 2020. I reviewed GAS050 files from July 2019 to April 2020 to confirm this.

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

Contact's compliance with rules 30 to 33 was examined by a "walk-through" of their processes and controls to confirm compliance.

GAS040 non-TOU energy submissions

Contact validates the GAS040 reports prior to submission. In some cases, consumption errors are found during the high consumption and forward estimate checks that cannot be corrected in SAP in time for submission. Contact manually estimates the consumption and creates an exclusion list. The submission file is generated from the reviewed information and adjusted for the exclusions, then the before and after data is compared to ensure the corrections were processed accurately.

I walked through these pre-submission checks for June 2020.

- ICPs with consumption over 36 GJ are reviewed against a list of known high users. ICPs in allocation group 6 with consumption over 36 GJ and ICPs in allocation group 4 using more than 500 GJ are checked, to confirm whether the consumption is genuine, and the allocation group is correct. Exclusions are processed if the consumption is found not to be genuine.
- Submission data is checked at total level. Revision consumption data is charted at total level before and after exclusions and compared to surrounding months and previous years. Initial consumption data is charted at gas gate level before and after exclusions and compared to previous months and years. Any anomalies are investigated.
- Gas gates included in the submission information are checked against SAP's contract start and end dates, and trading notifications are issued where required.

- Submission data is checked at gas gate level against the previous month for initial submissions, and previsions submissions for the same month for revisions. Anomalies are reviewed to determine whether the consumption is genuine. I noted that there were some significant differences for April 2020, which were caused by estimated data during COVID-19 lockdown washing out once actual data was received.

  Conditional formatting is used to identify consumption which is >+1000 GJ or >+50% compared to the previous revision. I recommend that this is changed to >+10% and <-10% and >+ 200 GJ and <-200 GJ to align with rule 37.2.

- The GAS040 is checked for negative values and any rows where historic estimate is greater than the total estimate.

SAS queries have been developed to check ICP days; and are being used while they are in the process of being refined. Exceptions are investigated and passed to the appropriate team for resolution. ICP discrepancies most commonly occur where a meter has not been loaded or removed in SAP, or where a settlement unit requires refreshing. Once refinement is complete, the ICP days queries will be run and reviewed in the last week of each month to validate ICP days.

Recommendation	Audited party comment
Update the gate level pre submission checks for interim allocations to conditional format any rows which do not meet the requirements of rule 37.2 (>+10% and <-10% and >+ 200 GJ and <-200 GJ) for investigation.	Response: Contact is looking at how we can implement this recommendation as part of our pre submission checks

GAS040 consumption and customer numbers were examined and compared to the data in Contact's system at ICP level for a sample of gas gates and months; the totals matched which confirms compliance. This also proves that Contact's consumption information provided to the allocation agent is calculated at ICP level and then aggregated.

Vacant ICPs

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

GAS050 TOU energy submissions

Contact supplied ICPs in allocation groups 1 and 2 up to 30/04/20. GAS050 submissions are generated directly from SAP. Contact validates the GAS050 reports prior to submission, and I walked through these pre-submission checks for January 2019.

- For initial submissions, daily and monthly data for each ICP is compared to the previous month for reasonableness. For interim and final submissions data for each ICP is compared to the previous revision. Any anomalies are investigated.

- Checks are conducted to ensure all expected ICPs are included, and the total consumption and ICP days for each included ICP appears complete and accurate.
- Estimates are checked, including that they appear reasonable and later actual data has been received which should replace the estimates. Estimates are flagged with an E in submission information, apart from permanent estimates. Contact did not create any temporary or permanent estimates between July 2019 and when their last TOU ICP switched out from May 2020. I reviewed GAS050 files from July 2019 to April 2020 to confirm this.

The GAS050 file for February 2020 was checked including tracing data from the source read files though the SAP conversion process into the GAS050 submissions for ICP 0000189481QTCF4. The conversion factors applied were within the maximum permissible errors set out in NZS 5259:2015, and the converted energy matched the GAS050 submission file. I confirmed that the correct calorific values were applied for the latest revision.

5.3 Initial Submission Accuracy (Rule 37.2)

Rule 37.2 requires that the accuracy of consumption information, for allocation groups 3 to 6, for initial allocation must be within a certain percentage of error published by the industry body.

Contact did not meet this requirement for some gas gates during the 25-month period shown. The results are summarised in the table below.

Month	Total Gas Gates	Number Within 10%	% Compliant	Within ±10% or < 200 GJ	% Compliant or immaterial
May 2017	83	22	26.5%	62	74.7%
Jun 2017	168	58	34.5%	132	78.6%
Jul 2017	252	111	44.0%	204	81.0%
Aug 2017	336	248	73.8%	332	98.8%
Sep 2017	420	270	64.3%	405	96.4%
Oct 2017	504	276	54.8%	468	92.9%
Nov 2017	588	266	45.2%	518	88.1%
Dec 2017	672	312	46.4%	608	90.5%
Jan 2018	756	423	56.0%	720	95.2%
Feb 2018	840	420	50.0%	810	96.4%
Mar 2018	924	638	69.0%	902	97.6%
Apr 2018	1008	636	63.1%	960	95.2%
May 2018	1008	576	57.1%	924	91.7%
Jun 2018	1008	372	36.9%	780	77.4%
Jul 2018	924	682	73.8%	891	96.4%

Month	Total Gas Gates	Number Within 10%	% Compliant	Within ±10% or < 200 GJ	% Compliant or immaterial
Aug 2018	840	610	72.6%	820	97.6%
Sep 2018	756	576	76.2%	747	98.8%
Oct 2018	672	400	59.5%	624	92.9%
Nov 2018	588	413	70.2%	588	100.0%
Dec 2018	504	336	66.7%	468	92.9%
Jan 2019	420	240	57.1%	405	96.4%
Feb 2019	336	180	53.6%	320	95.2%
Mar 2019	252	105	41.7%	225	89.3%
Apr 2019	168	66	39.3%	144	85.7%
May 2019	84	56	66.7%	83	98.8%

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

Month	Initial Submission All Gas Gates (GJ)	Final Submission All Gas Gates (GJ)	Percentage Variation
May 2017	209,945.61	267,003.34	-27.2%
Jun 2017	552,059.57	630,383.93	-14.2%
Jul 2017	941,683.79	1,068,111.12	-13.4%
Aug 2017	1,247,699.78	1,293,265.54	-3.7%
Sep 2017	1,379,313.97	1,395,674.81	-1.2%
Oct 2017	1,465,152.57	1,375,501.05	6.1%
Nov 2017	1,425,209.54	1,338,347.58	6.1%
Dec 2017	1,310,172.58	1,198,990.29	8.5%
Jan 2018	1,240,311.46	1,237,979.93	0.2%
Feb 2018	1,427,063.45	1,454,967.42	-2.0%
Mar 2018	1,822,754.19	1,869,657.87	-2.6%
Apr 2018	2,382,796.66	2,531,634.47	-6.2%
May 2018	3,285,496.10	3,539,251.84	-7.7%
Jun 2018	3,836,383.20	4,444,744.18	-15.9%
Jul 2018	4,263,565.35	4,175,746.14	2.1%
Aug 2018	3,578,492.58	3,555,665.88	0.6%

Month	Initial Submission All Gas Gates (GJ)	Final Submission All Gas Gates (GJ)	Percentage Variation
Sep 2018	2,689,068.93	2,751,106.98	-2.3%
Oct 2018	2,126,532.44	2,012,642.69	5.4%
Nov 2018	1,513,543.52	1,520,319.15	-0.4%
Dec 2018	1,058,201.96	1,038,133.39	1.9%
Jan 2019	781,988.12	757,498.45	3.1%
Feb 2019	582,405.45	597,447.07	-2.6%
Mar 2019	574,832.60	533,298.07	7.2%
Apr 2019	409,669.12	449,702.21	-9.8%
May 2019	286,027.73	285,191.45	0.3%

The tables 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. There is evidence that the accuracy of the initial submissions have improved over time due to improvements to the forward estimate process and strong submission validation controls. The variances are larger leading into the winter months because a mild seasonal profile is applied to avoid over billing and over accruing unbilled consumption, as all three processes use the same estimation methodology.

Contact monitors variances at gas gate and ICP level, and this reporting showed large variances were investigated. Most differences were due to forward estimates differing from actual data (particularly for group 4 ICPs which may be read before the end of the month) and seasonal fluctuations. I noted that there were some significant differences for April 2020, which were caused by estimated data during COVID-19 lockdown washing out once actual data was received.

Non-Conformance	Description	Audited party comment
Regarding: Rule 37.2 Control Rating: Effective	The initial submission accuracy did not meet the required accuracy percentage for some gas gates for the period May 2017 to May 2019.	Response: We are working hard with our meter reading service provider to improve read attainment in order to reduce our reliance on estimation of submission volumes for extended periods. Comments: • We have been implementing incremental improvements to our estimation methodology. Recently we have implemented the use of the losing traders' annual GJ consumption value into our estimation process where we do not have any of our own meter reads available to determine an accurate

Non-Conformance	Description	Audited party comment
		assessment of consumption for a recently gained ICP.

5.4 Forward Estimates (Rules 34 & 36)

The rules do not prescribe how forward estimates are to be calculated. Contact's forward estimates are calculated using the following methods, in order of priority:

1. Daily average consumption with temperature adjustment from an average at the same time the previous year.
2. Daily average consumption from the previous read to read period with temperature adjustment.
3. The average consumption received in the incoming GTN file if the value passes validation. If the last actual read date is more than 90 days before the switch event date or the average consumption in the GTN file is zero, the average consumption is not used because it is not considered to be reliable.
4. An average based on the allocation group, ICP location, and pricing group (e.g. business, residential standard or residential low user).

If an ICP is vacant, daily average consumption of zero is applied for forward estimate. The temperature adjustment is mild, because the same temperature adjustment is applied for billing and unbilled sales accruals.

Forward estimate is monitored as part of the pre-submission checks, and any anomalies are investigated. Forward estimate can be invalidly produced by system defects (such as phantom meters) and process issues (such as not entering disconnection and/or reconnection reads, or not processing inactive consumption corrections on time). Contact has put significant effort into resolving the system defects and the issues are largely resolved, however a recommendation to improve the timeliness of corrections is made in **section 3.5**.

Where a reading cannot be obtained within 12 months, permanent estimates are intended to be entered as part of the meter reading compliance process described in **section 3.3**. If a high priority read is requested but not received, a service order is created to change one of the existing estimated readings to a permanent estimate. In some cases, staff close the high priority read service orders before the permanent estimate read service order is created, and permanent estimates may be created late, or not created at all.

I checked the September 2019 final revision and found that two allocation group 4 ICPs had forward estimate remaining:

- ICP 0001440648QTC37 was unread because the meter could not be located and no readings were obtained, and no permanent estimate was entered.
- ICP 0000953421QTD8B was unread because its meter was upgraded to TOU in May 2019, but the change was not processed in SAP until May 2020 resulting in a delay in MRS obtaining readings. The ICP is settled as non-TOU and this is recorded as non-conformance in s**ection**

3.2. Both the corrected and uncorrected registers had the settlement flag set to Y, and forward estimate was generated for the corrected register although it is not used for settlement. The corrected register's settlement flag was updated to Y during the audit.

I checked the group 6 ICPs included in the September 2019 final submission with forward estimate and found:

- Ten ICPs had forward estimates remaining due to phantom meters, which required settlement units to be refreshed. Where workloads are heavy, staff sometimes do not have time to complete all reconciliation submission validation processes prior to submission.
- Three ICPs where readings were unable to be obtained due to access issues, and no permanent estimate reading was entered. In one case, the high priority read service order was closed, preventing a permanent estimate service order from being raised. For the other two ICPs, no high priority read was requested which prevented a permanent estimate service order from being raised.

Recommendation	Audited party comment
Review final revisions to identify forward estimate remaining, and the reasons forward estimate remains and permanent estimates were not entered. Conduct training and process improvements to ensure that permanent estimates are inserted prior to the final revision.	Response: Contact will investigate processes and systems associated with the recommendations and look to implement suggested improvements where practical.

5.5 Historic Estimates (Rules 34 & 35)

The process for managing shape files (SASV) was examined. There is an automated process where the allocation agent's web server is polled for new files. The new files overwrite the old files, and if a new file is not available, the most recent file remains. Manual intervention is only required where a file has failed to upload, and a BPEM is created to alert the user to the failure. Typically, failures occur only if a data value in one of the fields is not set up in SAP. The user will enter the data value in SAP's maintenance tables, and then move the file back to the source folder, so that it will be picked up for import.

The historic estimate process converts the read to read CM to energy, and then uses the most recent SASV to apportion the consumption between the reconciliation periods. This is compliant with the rules and ensures that sum of consumption apportioned to each month matches the total consumption for the read to read period.

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

Test	Scenario	Test expectation	Result
a	ICP becomes Active part way through a month	Consumption is only calculated for the Active portion of the month.	Correct
b	ICP becomes Inactive part way through a month.	Consumption is only calculated for the Active portion of the month.	Correct
c	ICP's become Inactive then Active within a month.	Consumption is only calculated for the Active portion of the month.	Correct
d	ICP switches in part way through a month on an estimated switch event reading	Consumption is calculated to include the 1st day of responsibility.	Correct
e	ICP switches out part way through a month on an estimated switch event reading.	Consumption is calculated to include the last day of responsibility.	Correct
f	ICP switches out then back in within a month	Consumption is calculated for each day of responsibility.	Correct
g	Continuous ICP with a read during the month	Consumption is calculated assuming the readings are valid until the end of the day	Correct
h	Continuous ICP without a read during the month	Consumption is calculated assuming the readings are valid until the end of the day	Correct
i	Rollover Reads	Consumption is calculated correctly in the instance of meter rollovers.	Correct
j	ICP has a multiplier or fixed factor (if any)	Consumption is calculated including the multiplier or fixed factor.	No examples available

5.6 Proportion of Historic Estimates (Rule 40.1)

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

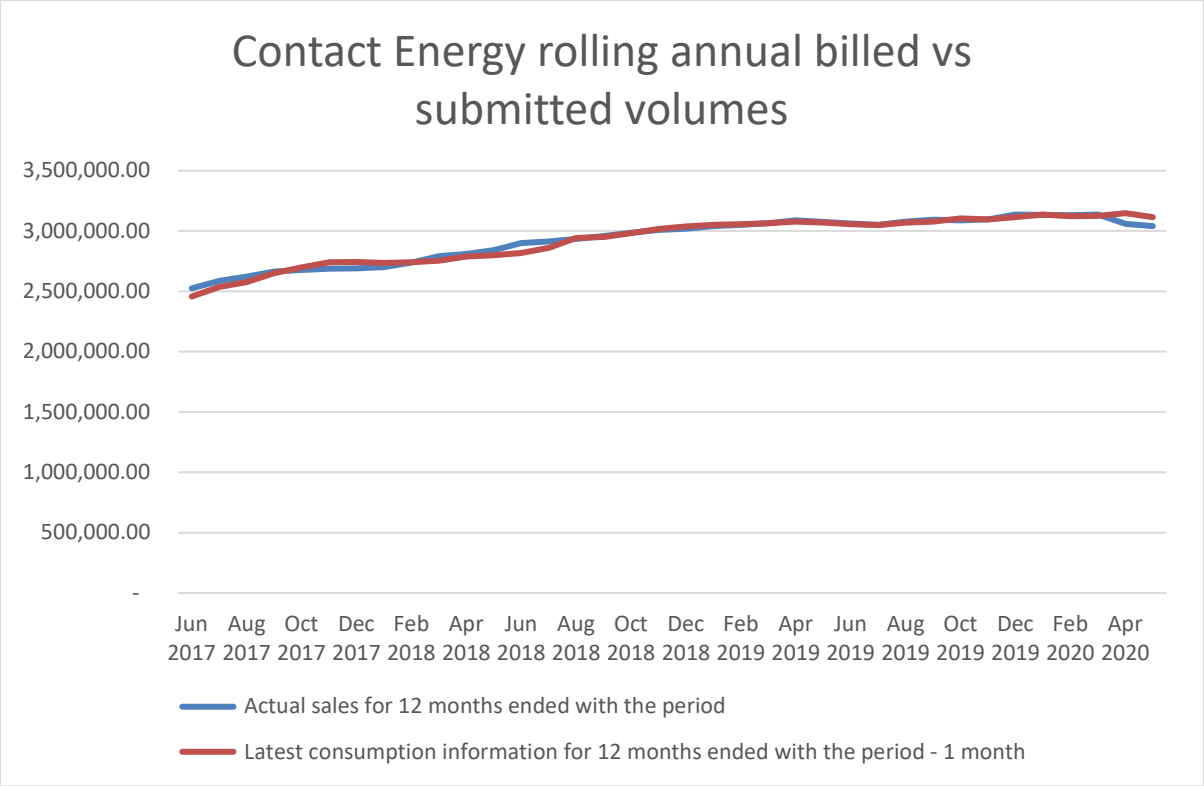
5.7 Billed vs Consumption Comparison (Rule 52)

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

The content of the GAS070 files was proved by selecting eight gas gates and checking the invoice data for all ICPs connected to the gas gate against the GAS070 file for September 2020. This confirmed that all the invoices included had invoice dates within September 2020, and invoices with negative consumption and invoice reversals were correctly included.

The chart below shows a comparison between rolling annual quantities billed and rolling annual consumption information submitted to the allocation agent for a 36-month period. Although the figures cannot be directly compared, as the submitted data is normalised, they can provide a useful indicator of whether under or over reporting of consumption is occurring.

Comparison between Rolling Annual Submitted Volumes and Gas Supplied



Year ending	Annual Billed GJ	Annual Consumption GJ	GJ difference	Percentage Difference
Aug 2017	2,620,391.79	2,577,530.62	42,861.17	1.7%
Nov 2017	2,687,736.36	2,740,372.61	-52,636.25	-1.9%
Feb 2018	2,738,498.87	2,740,848.13	-2,349.26	-0.1%
May 2018	2,842,536.71	2,800,534.46	42,002.24	1.5%
Aug 2018	2,934,237.87	2,943,585.20	-9,347.33	-0.3%
Nov 2018	3,010,039.68	3,016,654.09	-6,614.41	-0.2%
Feb 2019	3,051,819.56	3,056,957.01	-5,137.44	-0.2%
May 2019	3,076,178.88	3,069,014.50	7,164.38	0.2%
Aug 2019	3,077,068.97	3,069,574.52	7,494.45	0.2%

Year ending	Annual Billed GJ	Annual Consumption GJ	GJ difference	Percentage Difference
Nov 2019	3,097,341.59	3,096,820.67	520.92	0.0%
Feb 2020	3,130,835.28	3,122,124.74	8,710.54	0.3%
May 2020	3,040,191.38	3,114,512.73	-74,321.35	-2.4%

I reviewed the differences between billed and submission data and found they were attributed to:

- a high proportion of estimates during COVID-19 lockdowns - as actual readings are received the differences are being washed out,
- vacant consumption, which is included in submitted volumes but is not billed, and
- timing of invoices and reversals, relative to the period the consumption is reconciled within.

The previous audit found some issues with the GAS070 submissions, which were revisited to determine whether they were resolved:

Previous audit issue	Current audit finding
Invoice reversals were not included in the GAS070.	Cleared. Invoice reversals and negative volumes (e.g. an invoice for an actual reading lower than a previous estimate) are included in the GAS070.
Network changes for Waitoki B resulted in volumes recorded against incorrect gas gates.	Cleared. This was a temporary issue because the change occurred part way through the invoice period. Wash up data was unable to be provided, because there is no revision cycle for the GAS070. No further issues were identified.
Missing POD groups	Cleared. The issue is resolved, and no further issues were identified.

5.8 Gas Trading Notifications (Rule 39)

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

Gates requiring trading notifications are identified through Contact's pre submission validation process described in **section 5.2**.

6. Recommendations

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

- Identify any ICPs where register content codes, the TOU metering flag and metering details are inconsistent, to confirm which values are correct. Any ICPs which genuinely have TOU metering should be settled as TOU.
- Ensure that inputs into the gas conversion process are correct:
    - Continue with work to investigate the bypassing of billing locks for inputs into the gas conversion process for reconciliation data including gas gate, altitudes, and pressures, to allow conversion factors to be applied for the correct date range.
    - Review processes to ensure the correct gas gate is assigned for backdated changes to gas gate information during Contact's period of supply for ICPs which have switched out or been decommissioned, and ICPs which have previously been supplied which switch back in.
- Update ICP allocation groups as soon as practicable, instead of waiting for the meter reading schedule to be updated.
- I recommend that the Bot read validation processes are reviewed, and corrective action is taken if the processes are not consistently operating as intended. Issues have already been identified by Contact for the following validation processes:
    - treatment of returned control readings, which have been released by Bots although they are required to always be reviewed by a user,
    - treatment of inactive consumption, including misclassification of actual readings, and
    - release of readings where disconnection or reconnection is in progress.
- Improve monitoring of field services jobs, to ensure that field service visit results are promptly received and reviewed, and corrective action can be taken if necessary.
- Improve the timeliness of identification and correction of meter pressure discrepancies.
- Develop a procedure to manage creeping meters. As part of this process Contact should check paperwork to confirm that the ICP was successfully disconnected and set a threshold for maximum expected consumption for meter creep. If the consumption is above the threshold, I recommend investigating to determine whether the ICP has been reconnected and taking corrective action as required.
- Consider displaying a breakdown of conversion factors for each read to read period in SAP's front end, including: temperature factor (and temperature applied), compressibility factor, pressure factor (and pressure applied) and altitude factor (and altitude applied), and calorific value.

- Update the gate level pre submission checks for interim allocations to conditional format any rows which do not meet the requirements of rule 37.2 (>+10% and <-10% and >+ 200 GJ and <-200 GJ) for investigation.
- Review final revisions to identify forward estimate remaining, and the reasons forward estimate remains and permanent estimates were not entered. Conduct training and process improvements to ensure that permanent estimates are inserted prior to the final revision.

Appendix 1 – Control Rating Definitions

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

Appendix 2 – Contact Energy Comments

Contact Energy have reviewed this report and their comments are contained within its body.