## Gas Downstream Reconciliation Performance Audit Final Report

For

## **Genesis Energy Limited and Frank Energy**



Prepared by

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Date of Audit: 20-23 November 2023

Date Audit Report Complete: 25 May 2024

## **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 three participants codes: Genesis Energy non TOU (GENG), Genesis Energy TOU (GEND) and Frank Energy (GEOL).

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" (<u>http://www.gasindustry.co.nz/dmsdocument/2858</u>). which was published by GIC in June 2013.

This three year audit period has been challenging for Genesis Energy and Frank Energy as well as the industry in general due to the Covid 19 pandemic and also extreme weather events impacting work practices and resourcing, meter read attainment, and customers consumption patterns.

Genesis Energy and Frank Energy continue to have a culture where compliance is an integral part of how they do business, and there is a strong focus on ensuring that information updates are timely and accurate.

The summary of report findings in the table below shows that Genesis Energy's and Frank Energy's control environment is 'effective' for 12 of the areas, 'acceptable' for three areas and 'needs improvement for four areas evaluated.

Eight of the 19 areas evaluated were found to be compliant. Nine breach allegations are made in relation to:

- Incorrect ICP and meter set up information.
- Meter read attainment for allocation group 4 ICPs.
- Incorrect gas conversion used for Non TOU submissions.
- Some stopped meter corrections incorrectly calculated.
- corrections for inactive consumption which have not been processed.
- TOU estimation methodology.
- Initial GAS040 submissions which were not within ±10% or < 200 GJ of the final submission.
- HE scenario relating to pressure change incorrectly calculated.

One breach allegation is also made against Powerco as the distributor responsible for ICP 0002288991QT337 where the registry altitude value is incorrect when compared to google earth resulting in an incorrect altitude factor being applied which was over the maximum permissible error  $(\pm 1.0)$  set out in **NZS 5259:2015** 

16 recommendations were made to improve future compliance. The recommendations are listed in **section 6** and the relevant report sections.

## Summary of Report Findings

Issue	Section	Control Rating (Refer to Appendix 1 for definitions)	Compliance Rating	Comments	
Transmission methodology and audit trails	1.6	Effective	Compliant	Effective transmission and audit trail processes are in place.	
ICP set up information	2.1	Effective	Not compliant	The majority of ICP information checked in this section was accurate. Exception reporting was consistently monitored during audit period. One registry altitude value is incorrect relating to Genesis Energy ICF 0002288991QT337 when compared to google earth resulting in an altitude factor which was over the maximum permissible error in NZS 5259:2015.	
Metering set up information	2.2	Effective	Compliant	<ul> <li>Metering information checked in this section was accurate. Registry vs Geness Energy ICP meter attributes reporting was consistently monitored during aud period.</li> <li>One recommendation made to improve accuracy of gas TOU conversion.</li> <li>Implement process to regularly compare meter equipment own records of the corrector function to The Oracle SQL database regists content code for the ICP to ensure alignment and correct application of gas factors.</li> </ul>	
Billing factors	2.3	Effective	Compliant	Effective processes are in place for ensuring accurate temperature and calorific values are maintained in Gentrack / MSD.	
Archiving of reading data	3.1	Effective	Compliant	Effective practices are in place for archiving of register reading data.	

Issue	Section	Control Rating (Refer to Appendix 1 for definitions)	Compliance Rating	Comments
Meter interrogation requirements	3.2	Needs Improvement	Not compliant	The allocation group monitoring report is run and reviewed on an ad hoc basis and has only been run once in the last 12 months in preparation for the audit.
				171 Genesis Energy ICPs with annualised consumption over 250 GJ incorrectly assigned to Allocation group 6.
				171 Genesis Energy ICPs with annualised consumption under 250 GJ incorrectly assigned to Allocation group 4.
				Genesis Energy forward estimate volumes present for 26 gas gates for Allocation group 4 final revisions relating to April 2022, 19 gas gates relating to May 2022 and 21 gas gates for June 2022 due to ICPs not being consistently read monthly. No permanent estimates were applied resulting in potential over / under submission once an actual read is obtained for the affected ICPs.
				One Frank Energy ICP (0002028507NG9A5) with annualised consumption over 250 GJ was incorrectly assigned to Allocation group 6 during the audit period.
				10 Frank Energy ICPs with annualised consumption under 250 GJ incorrectly assigned to Allocation group 4.
				Three recommendations made to improve process effectiveness.
				<ul> <li>Genesis Energy - Review the selection criteria of the allocation group exception report to ensure all ICP exceptions ae identified for review.</li> </ul>
				<ul> <li>Genesis Energy - Review read attainment process for allocation group 4 ICPs to ensure any meter read attainment issues are escalated and resolved as soon as possible.</li> </ul>
				<ul> <li>Review outstanding allocation group 4 forward estimate volumes for interim revisions as a measure of the reading performance for</li> </ul>

Issue	Section	Control Rating (Refer to Appendix 1 for definitions)	Compliance Rating	Comments	
				allocation group 4 ICPs and ensure the read issues impacting these ICPs are resolved prior to final revisions.	
Meter reading requirements	3.3	Acceptable	Not compliant	Genesis Energy's meter reading processes for allocation group 6 ICPs appear robust and reduce the reliance on forward estimates to ensure submission accuracy.	
				Some Genesis Energy allocation group 4 ICPs have not been successfully read monthly. Analysis of the allocation group 4 submission volumes relating to the Genesis Energy final GAS040 revisions for April (6.8 TJ), May (3.5 TJ) and June 2022(8.8 TJ)) identified that forward estimate volumes were present.	
			Some Frank Energy allocation group 4 ICPs have not been successfully read monthly. Analysis of the allocation group 4 submission volumes relating to the Frank Energy final GAS040 revision for June 2022 (3.377 GJ) identified that forward estimate volumes were present.		
			For two Frank Energy ICPs (0004209354NG447, 0003008054NG71C) Exceptional circumstances do not apply as no action beyond scheduled meter reads was attempted.		
				Genesis Energy does not have a separate no read escalation process for allocation group 4 ICPs resulting in the allocation group 6 process being applied to try and obtain one read each 12 months instead of escalating the access issue after one missed read.	
				Two recommendations made to improve process effectiveness.	
				<ul> <li>Genesis Energy - Review the selection criteria of the No Read ICP List exception report to ensure all active ICPs (ACTC and ACTV registry status) with no reads for 12 months are included and the registry allocation group and status is also reported to allow users to prioritise next steps.</li> </ul>	

Issue	Section	Control Rating (Refer to Appendix 1 for definitions)	Compliance Rating	Comments	
				<ul> <li>Frank Energy - Ensure all reported gas meter condition codes are investigated in a timely manner to support the read attainment processes</li> </ul>	
Non-TOU validation	3.4	Effective	Compliant	A robust validation process is in place before and after invoicing.	
Non-TOU error correction	3.5	Needs Improvement	Not compliant	Efficient monitoring in place for potential stopped meters and meter pressure differences.	
				Volume correction processes are in place once the required correction is identified, however some issues were identified.	
				The volume correction for three Genesis Energy stopped meter ICPs (0001411469QT5F4, 1001113175QTB9E, 1002047747QT0B6) the calculation was incorrect as the user applied an incorrect number of affected days the removed meter had stopped.	
				For six Genesis Energy inactive consuming ICPs (0001515181QTAB3 – 5.48 GJ, 1001110193QT24B – 4.17 GJ, 0054229465PGDEA – 3.84 GJ, 1001108670QTED2 – 3.8 GJ, 1000611527PG55E – 2.81 GJ, 1000593610PGCBE – 1.91 GJ), no corrections have been applied.	
				For three Frank Energy inactive consuming ICPs (1002062624QT46F – 0.515 GJ, 1000611977PG15A – 0.454 GJ, 1002165386QT9FC – 0.331 GJ), no corrections have been applied.	
				For two Frank Energy inactive consuming ICPs (1000541054PG606 – 1.26 GJ, 1000518325PG3C9 – 1.11 GJ), The ICPs switched away before any investigations or registry status updates were performed.	
				Three recommendations made to improve process effectiveness.	

Issue	Section	Control Rating (Refer to Appendix 1 for definitions)	Compliance Rating	Comments
				<ul> <li>Genesis Energy - Review the format of the spreadsheet template 'Gas New Calculations spreadsheet' to ensure users are not able to incorrectly apply an incorrect number of affected days for the stopped meter volume calculation.</li> <li>Genesis Energy - Investigate implementing a peer review process to the stopped meter volume correction process to ensure the calculation steps and data inputs are correct in every case.</li> <li>Frank Energy - Investigate amending the inactive consuming report to include all inactive periods where Frank Energy is recorded as the retailer and where inactive consumption is detected for each of these ICP tenue periods.</li> </ul>
TOU validation	3.6	Effective	Compliant	Robust TOU validation processes are in place.
				One recommendation made to improve process effectiveness.
				<ul> <li>Genesis Energy - work with the TOU data collectors to implement a notification process for time corrections greater than ± 300 seconds enable Genesis Energy to review the TOU data and determine if a data correction is also required</li> </ul>
Energy consumption calculation	4	Needs Improvement	Not compliant	The process to convert consumption to energy for non-TOU ICPs is non compliant. Genesis Energy and Frank Energy apply temperature and calorific values as at the meter read to date to calculate the temperature and CV factors instead of an average of the values across the read to read period as described in <b>NZS 5259:2015</b> and also the GIC billing factors guideline. Genesis Energy and Frank Energy do not apply Joule-Thomson Effect to the temperature factor calculation resulting in the temperature factor for 144 ICPs

Issue	Section	Control Rating (Refer to Appendix 1 for definitions)	Compliance Rating	Comments
				being outside the maximum permissible errors (± 0.9%) set out in NZS 5259:2015. The volume to energy conversion for four Genesis Energy TOU ICPs (0000322831QT39A, 0004226830NG91E, 1001294166NGCC4, 0008000080NG849) is incorrect as the register content (TG) did not match the meter owner's information (TA) resulting in altitude factor being applied twice.
				• For ICP 1001294166NGCC4, the additional application of the altitude factor to volumes already adjusted for altitude within the corrector resulted in the altitude factor being outside the maximum permissible errors (±0.5%) set out in NZS 5259:2015. The impact of this error was assessed to be 0.74% or 38.38 TJ per annum.
				For Genesis Energy ICP 0004226830NG91E, the difference between the reported energy consumption and the independently calculated energy consumption was found to be 4.41% (impact – 5.69 GJ) for March 2023. The cause was identified as that the meter pressure had not been converted from BAR to kPa prior to the volume to energy calculation. This conversion step (BAR to kPa) was also missed for this ICP for February (impact – 3.62 GJ) and April 2024 impact – 5.69 GJ). The conversion error exceeds the maximum permissible errors ( $\pm 0.9\%$ ) as set out in <b>NZS 5259:2015</b> .
				Three recommendations made to improve process effectiveness.
				<ul> <li>Genesis Energy - review all Gas TOU ICPs, for all available revision consumption periods, that require meter pressure conversions from BAR to kPa to ensure all upload data in the Oracle SL database has the correct meter pressures used for submission and also billing.</li> <li>Genesis Energy - investigate implementing a monthly check for all ICPs that require the manual processing to the SQL script to convert</li> </ul>

Issue	Section	Control Rating (Refer to Appendix 1 for definitions)	Compliance Rating	Comments	
				<ul> <li>meter pressure from BAR to kPa to ensure gas TOU energy volumes will be correctly calculated for billing and submission purposes.</li> <li>Genesis Energy - to reduce the impact of not applying Joule-Thomson effect to the temperature factor calculations on industry UFG investigate the effort to implement the Joule-Thomson effect into the temperature factor calculation for both billing and submission across all active ICPs.</li> </ul>	
TOU estimation and correction	5.1	Needs Improvement	Not compliant	Genesis Energy's TOU permanent estimation process is not consistent will schedule 1 of the Gas Downstream Regulations as for seven ICPs the permaner estimation applied as once the affected volume has been identified it converted to energy using a default CV value prior to applying a seasonal shat to determine the daily submission volumes.	
				Estimated TOU data for ICP 1002057962QTE46 (gas gate TUK06502) for November 2021 was performed using customer information of expected usage patterns rather than using corrected / uncorrected meter reads resulting in an under reporting of volume identified as unexpected UFG for this month.	
Provision of retailer consumption information	5.2	Acceptable	Not compliant	There was a delay in updating the registry for 19 Genesis Energy new connections and 19 Frank Energy new connections where the consumption information not provided until the interim or final revision.	
				There was a delay in updating the registry for two Genesis Energy new connection ICPs (1000602472PG31C, 1000592715PG955) which were not resolved in time for the final GAS040 Submission for some consumption periods.	

Issue	Section	Control Rating (Refer to Appendix 1 for definitions)	Compliance Rating	Comments
				<ul> <li>For six Genesis Energy and one Frank Energy new connection ICPs, the time taken to claim the ICP and update the status to active as resulted in some periods now being outside the revision window.</li> <li>For three Frank Energy ICPs (ICPs 1000563170PG9D0 – 662 days, 0001424174QT30B - 556 days, 1000596140PGC94 – 438 days) the switch event dates were backdated more than 13 months resulting in some consumption volumes not able to be included in the submission process.</li> <li>Two recommendations made to improve process effectiveness.</li> <li>Genesis Energy - Include review of the daily TOU data whenever an ICP is identified in the submission checks as being outside the expected volume thresholds compared to historical consumption patterns or previous submissions.</li> <li>Genesis Energy - Investigate implementing post submission UFG monitoring of TOU gas gates to ensure any potential TOU data corruption is identified and resolved in a timely manner.</li> </ul>

Issue	Section	Control Rating (Refer to Appendix 1 for definitions)	Compliance Rating	Comments	
Initial submission accuracy	5.3	Effective	Not compliant	Genesis Energy did not meet the requirement for initial submissions to be within ±10% or < 200 GJ of the final submission for each gas gate on 415 occasions for submission periods between July 2019 and June 2022.	
				For three submission periods (Feb 2022 – 13.21%, May 2022 – 15.58% and Jun 2022 – 16.12%) the overall submission volumes have exceeded the $\pm$ 10% threshold.	
				Frank Energy did not meet the requirement for initial submissions to be within ±10% or < 200 GJ of the final submission for each gas gate on 75 occasions for submission periods between July 2019 and June 2022.	
				For four submission periods (February 2022 – $11.64\%$ , May 2022 – $13.64\%$ and June 2022 – $15.87\%$ ) the overall submission volumes have exceeded the $\pm$ 10% threshold.	
Forward estimates	5.4	Effective	Compliant		
Historic estimates	5.5	Acceptable	Not compliant	Compliance was achieved for 10 of the 11 scenarios tested during the audit. The pressure factor relating to a meter pressure change relating to a meter change was incorrectly calculated (scenario L) as the change in meter pressure during the month was not reflected in the historic estimate calculation.	
Proportion of HE	5.6	Effective	Compliant	Reporting has been provided as required.	

Issue	Section	Control Rating (Refer to Appendix 1 for definitions)	Compliance Rating	Comments
Billed vs consumption comparison	5.7	Effective	Compliant	<ul> <li>One recommendation was made:</li> <li>Frank Energy - Investigate the cause of why the annual billed volumes reported are consistently higher than the annual consumption volumes reported for GEOL.</li> </ul>
Gas Trading Notifications	5.8	Effective	Compliant	Processes are in place to ensure that trading notifications are issued where required.

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## **1.** Pre-Audit and Operational Infrastructure Information

### **1.1** Scope of Audit

This Performance Audit was conducted at the request of the 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 onsite at the Hamilton office on November 20 to 22 2023.

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



## 1.2 Audit Approach

As mentioned in **section 1.1** the purpose of this audit is to assess the performance of Genesis Energy in terms of compliance with the rules, and the systems and processes that have been put in place to enable compliance with the rules.

This audit has examined the effectiveness of the controls Genesis Energy has in place to achieve compliance, and where it has been considered appropriate, sampling has been undertaken to determine compliance.

Where sampling has occurred, this has been conducted using the Auditing Standard 506 (AS-506) which was published by the Institute of Chartered Accountants of New Zealand. I have used my professional judgement to determine the audit method and to select sample sizes, with an objective of ensuring that the results are statistically significant.<sup>1</sup>

Where calculations are performed by Genesis Energy's systems, the algorithm has been checked by using one or two examples as a "sample". Multiple examples are not required because they will not introduce any different variables.

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

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

## **1.3** General Compliance

#### 1.3.1 Summary of Previous Audit

Genesis Energy and Frank Energy provided a copy of their previous audits conducted in 2020 by Langford Consulting Ltd. Six breach allegations were made, and resolution of these matters is summarised in the table below:

Breach notice number	Participant Code	Breach Allegation	Rule	Section in this report	Resolution
2020-058	GENG GEOL GEND	GENG was late adding new ICPs into their submission files for 3 new active ICPs out of a sample of 64 ICPs. GEOL was late adding new ICPs into their submission files for 2 new ICPs out of a sample of 31 ICPs. GEND was late adding new ICPs into their submission files for 2 new ICPs out of a sample of 2 ICPs	28.3	2.1.1	Further non- conformance was found during this audit.

<sup>&</sup>lt;sup>1</sup> in statistics, the determination that a result or an observation from a set of data is due to intrinsic qualities and not random variance of a sample. Statistical significance does not imply the size, importance, or practicality of an outcome; it simply indicates that the outcome's difference from a baseline is not due to chance. (Encyclopaedia Britannica)

Breach notice number	Participant Code	Breach Allegation	Rule	Section in this report	Resolution
2020-060	GENG	GENG as the responsible retailer for two ICPs with inaccurate altitude in the registry which will have been used in energy calculations which would therefore have been inaccurate.	28.2	2.1.2	Further non- conformance was found during this audit.
2020-061	GENG	GENG has assigned an ICP to allocation group 4 but have not ensured that the register reading is recorded monthly.	29.4.2	3.2	Further non- conformance was found during this audit.
2020-062	GENG	Six GENG ICPs were assigned to allocation group 4 when they should have been assigned to allocation group 6.	29.3	3.2	Further non- conformance was found during this audit.
2020-063	GENG GEOL	The compressibility calculation used for GENG/GEOL submission files is not NZS5259 compliant.	28.2	4	Further non- conformance was found during this audit.
2020-064	GEND	GEND included the billing information for one ICP in the incorrect gas gate.	26.2.1	5.7	No further issues were identified

The table below shows the recommendations made during the previous audit and whether they have been adopted.

Section	Recommendation	Status
3.2	That Genesis review any ICPs where the allocation group has been identified as requiring change to see if the necessary back office action has occurred to implement the decision.	Adopted
3.2	That Genesis routinely review ICPs for usage that has moved above or below the 10TJs per	Adopted

Section	Recommendation	Status
	annum threshold to identify ICPs that may need to move allocation group	
3.2	That all the active ICPs where the load shedding group is inconsistent with the allocation group be identified and reviewed for all three Genesis retailers	Not Adopted
3.2	The report used annually by Genesis to reassess allocation groups should be reviewed	Not Adopted
5.3	That Genesis undertakes a review of its processes for identifying new connections and recently switched in consumers and recently switched out consumers, to ensure their prompt inclusion/exclusion in submission files for GENG, GEOL and GEND.	Not Adopted

## **1.3.2** Breach Allegations

Genesis Energy has two alleged breaches recorded by the Market Administrator between 1 October 2020 and 31 July 2023 excluding the six alleged breaches raised in relation to the 2020 performance audits. This is summarised as below:

Breach Allegation	Breach No.	Rule	Outcome				
Alleged breaches raised by Allocation Agent							
GEND TOU data was submitted (initial submission) for an ICP where Genesis Energy was no longer the retailer for February 2021	2021-081	26.2.1	The Market Administrator did not raise any material issues.				
GEND Incorrect TOU data (zero values) was submitted for eight days in December 2021 due to a meter change where data from the new device was not provided.	2022-003	26.2.1	The Market Administrator did not raise any material issues.				

Six alleged breaches were recorded in relation to the 2020 performance audits, and the outcomes are recorded in the table below.

Participant	Breach Allegation	Breach No.	Rule	Section	Outcome
Code				in this	
				report	

GENG GEOL GEND	GENG was late adding new ICPs into their submission files for 3 new active ICPs out of a sample of 64 ICPs. GEOL was late adding new ICPs into their submission files for 2 new ICPs out of a sample of 31 ICPs. GEND was late adding new ICPs into their submission files for 2 new ICPs out of a sample of 2 ICPs	2020-058	28.3	2.1.1	The Market Administrator did not raise any material issues
GENG	GENG as the responsible retailer for two ICPs with inaccurate altitude in the registry which will have been used in energy calculations which would therefore have been inaccurate.	2020-060	28.2	2.1.2	The Market Administrator did not raise any material issues.
GENG	GENG has assigned an ICP to allocation group 4 but have not ensured that the register reading is recorded monthly.	2020-061	29.4.2	3.2	The Market Administrator did not raise any material issues.
GENG	Six GENG ICPs were assigned to allocation group 4 when they should have been assigned to allocation group 6.	2020-062	29.3	3.2	The Market Administrator did not raise any material issues.
GENG GEOL	The compressibility calculation used for GENG/GEOL submission files is not NZS5259 compliant.	2020-063	28.2	4	The Market Administrator did not raise any material issues.
GEND	GEND included the billing information for one ICP in the incorrect gas gate.	2020-064	26.2.1	5.7	The Market Administrator did not raise any material issues.

As noted in the Summary of Report Findings, this audit recorded non conformance in ten sections leading to 19 breach allegations, as shown in the table below.

Breach Allegation		Rule	Section in this report
One registry altitude value is incorrect relating to ICP 0002288991QT337 when compared to google earth resulting in an altitude factor which was over the maximum permissible error (±1.0 %) set out in NZS 5259:2015	GENG	28.2	2.1.2
171 Genesis Energy (GENG) ICPs with annualised consumption over 250 GJ incorrectly assigned to Allocation group 6.	GENG GEOL	29.2.2	3.2
One Frank Energy (GEOL) ICP (0002028507NG9A5) with annualised consumption over 250 GJ was incorrectly assigned to Allocation group 6 during the audit period.			

Breach Allegation		Rule	Section in this report
171 Genesis Energy (GENG) ICPs with annualised consumption under 250 GJ incorrectly assigned to Allocation group 4.	GENG GEOL	29.3	3.2
Ten Frank Energy (GEOL) ICPs with annualised consumption under 250 GJ were incorrectly assigned to Allocation group 4 during the audit period.			
Genesis Energy (GENG)	GENG	29.4.2	3.3
Forward estimate volumes present for 26 gas gates for Allocation group 4 final revisions relating to April 2022, 19 gas gates relating to May 2022 and 21 gas gates for June 2022 due to ICPs not being consistently read monthly.	GEOL		
No permanent estimates were applied resulting in potential over / under submission once an actual read is obtained for the affected ICPs.			
Some allocation group 4 ICPs have not been successfully read monthly. Analysis of the allocation group 4 submission volumes relating to final GAS040 revisions for April (6.8 TJ), May (3.5 TJ) and June 2022 (8.8 TJ)) identified that forward estimate volumes were present.			
Genesis Energy and Frank Energy do not have a separate no read escalation process for allocation group 4 ICPs resulting in the allocation group 6 process being applied to try and obtain one read each 12 months instead of escalating the access issue after one missed read.			
Frank Energy (GEOL)			
Some allocation group 4 ICPs have not been successfully read monthly. Analysis of the allocation group 4 submission volumes relating to final GAS040 revision for June 2022 (3.377 GJ) identified that forward estimate volumes were present.			
For two ICPs (0004209354NG447, 0003008054NG71C) Exceptional circumstances do not apply as no action beyond scheduled meter reads was attempted.			
The volume correction for three stopped meter ICPs (0001411469QT5F4, 1001113175QTB9E, 1002047747QT0B6) the calculation was incorrect as the user applied an incorrect number of affected days the removed meter had stopped.	GENG GEOL	26.2	3.5
For six inactive consuming ICPs (0001515181QTAB3 – 5.48 GJ, 1001110193QT24B – 4.17 GJ, 0054229465PGDEA – 3.84 GJ, 1001108670QTED2 – 3.8 GJ, 1000611527PG55E – 2.81 GJ, 1000593610PGCBE – 1.91 GJ), no corrections have been applied.			
For three ICPs (1002062624QT46F – 0.515 GJ, 1000611977PG15A – 0.454 GJ, 1002165386QT9FC – 0.331 GJ), no corrections have been applied.			
For two ICPs (1000541054PG606 – 1.26 GJ, 1000518325PG3C9 – 1.11 GJ), The ICPs switched away before any investigations or registry status updates were performed.			

Breach Allegation		Rule	Section in this report
Genesis Energy (GENG) and Frank Energy (GEOL) apply temperature and calorific values as at the meter read to date to calculate the temperature and CV factors instead of an average of the values across the read to read period as described in NZS 5259:2015 and also the GIC billing factors guideline.	GEND GENG GEOL	28.2	4
Genesis Energy (GENG) and Frank Energy (GEOL) do not apply Joule- Thomson Effect to the temperature factor calculation resulting in the temperature factor for 144 ICPs being outside the maximum permissible errors (± 0.9%) set out in <b>NZS 5259:2015</b> .			
The volume to energy conversion for four Genesis Energy (GEND) TOU ICPs (0000322831QT39A, 0004226830NG91E, 1001294166NGCC4, 0008000080NG849) is incorrect as the register content (TG) did not match the meter owner's information (TA) resulting in altitude factor being applied twice.			
<ul> <li>For ICP 1001294166NGCC4, the additional application of the altitude factor to volumes already adjusted for altitude within the corrector resulted in the altitude factor being outside the maximum permissible errors (±0.5%) set out in NZS</li> <li>5259:2015. The impact of this error was assessed to be 0.74% or 38.38 TJ per annum.</li> </ul>			
For Genesis Energy (GEND) TOU ICP 0004226830NG91E, the difference between the reported energy consumption and the independently calculated energy consumption was found to be 4.41% (impact – 5.69 GJ) for March 2023. The cause was identified as that the meter pressure had not been converted from BAR to kPa prior to the volume to energy calculation. This conversion step (BAR to kPa) was also missed for this ICP for February (impact – 3.62 GJ) and April 2024 impact – 5.69 GJ). The conversion error exceeds the maximum permissible errors ( $\pm$ 0.9%) as set out in <b>NZS 5259:2015</b>			
For seven ICPs the permanent estimation applied was not consistent with Schedule 1 of the Gas Downstream Regulations as once the affected volume has been identified it is converted to energy using a default CV value prior to applying a seasonal shape to determine the daily submission volumes.	GEND	Schedule 1	5.1
Estimated TOU data for ICP 1002057962QTE46 (gas gate TUK06502) for November 2021 was performed using customer information of expected usage patterns rather than using corrected / uncorrected meter reads resulting in an under reporting of volume identified as unexpected UFG for this month.			
There was a delay in updating the registry for 19 Genesis Energy new connections and 19 Frank Energy new connections where the consumption information not provided until the interim or final revision.	GENG GEOL	26.2	5.2
There was a delay in updating the registry for two Genesis Energy new connection ICPs (1000602472PG31C, 1000592715PG955) which were			

Breach Allegation		Rule	Section in this report
not resolved in time for the final GAS040 Submission for some consumption periods.			
For six Genesis Energy and one Frank Energy new connection ICPs, the time taken to claim the ICP and update the status to active as resulted in some periods now being outside the revision window.			
For three Frank Energy ICPs (ICPs 1000563170PG9D0 – 662 days, 0001424174QT30B - 556 days, 1000596140PGC94 – 438 days) the switch event dates were backdated more than 13 months resulting in some consumption volumes not able to be included in the submission process.			
Genesis Energy did not meet the requirement for initial submissions to be within ±10% or < 200 GJ of the final submission for each gas gate on 415 occasions for submission periods between July 2019 and June 2022.	GENG GEOL	37.2	5.3
For three submission periods (Feb 2022 – 13.21%, May 2022 – 15.58% and Jun 2022 – 16.12%) the overall submission volumes have exceeded the $\pm$ 10% threshold.			
Frank Energy did not meet the requirement for initial submissions to be within ±10% or < 200 GJ of the final submission for each gas gate on 75 occasions for submission periods between July 2019 and June 2022.			
For four submission periods (February 2022 – 11.64%%, May 2022 – 13.64% and June 2022 – 15.87%) the overall submission volumes have exceeded the $\pm$ 10% threshold			
The pressure factor relating to a meter pressure change relating to a meter change (Genesis Energy ICP 0000103631QT524, Frank Energy ICP 0000034731QTD00) as the change in meter pressure during the month was not reflected in the historic estimate calculation.	GENG GEOL	28.2	5.5

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
One registry altitude value is incorrect relating to ICP 0002288991QT337 when compared to google earth resulting in an altitude factor which was over the maximum permissible error (± 1.0) set out in <b>NZS 5259:2015.</b>	POCO	26.5.1 <i>,</i> 26.5.4	2.12

## **1.4** Provision of Information to the Auditor (Rule 69)

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

Information was provided by Genesis Energy and Frank Energy in a timely manner in accordance with this rule.

Information was requested from metering equipment owners and non TOU meter reading agents 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	Attached to report
Genesis Energy	Comments on the draft audit report	23 May 2024 by email	Genesis Energy's comments have been added to the remedial action and audited party comment sections of the non compliance and recommendation boxes within this report.
Powerco	Comments on the draft audit report	4 June 2024 by email	Powerco's comments have been added to the remedial action and audited party comment section of the non compliance.

## **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 Genesis Energy'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.

Audit trails are created in Gentrack / MSD when data used to create the GAS040 or GAS050 reports is changed.

# 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 November 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.

#### **Genesis Energy**

As soon as Genesis Energy are aware of a new connection application where Genesis Energy is the proposed retailer and the ICP number has been created, the ICP is claimed on the registry and the status updated to inactive – transitional (INACT). Attempts are then made to contact the proposed customer and complete a customer agreement.

New connections are managed via the networks' portals. Progress notifications are automatically generated, and the relevant details are manually loaded into Gentrack. Details are entered in a new connections pending spreadsheet.

A field service job is then raised in Siebel for the meter installation, where this is not also managed by the distributor livening process, and the process is then passed back to the network and meter installer. When paperwork is received from the meter owner to say that the meter is now installed, the meter is then set up in Gentrack and the customer moved from being a future consumer to a current consumer. Gentrack in turn updates the registry status to active automatically.

Genesis Energy operates on a 30 day internal SLA for gas new connections. All outstanding proposed new connections are followed up after this period with both the customer and the distributor to provide updates regarding an expected livening ETA. Where a revised living date is not able to be provided the field service job in Seibel is cancelled and another Siebel field service job is raised once the customer or distributor is able to provide a new proposed livening date. If the customer decides not to process with the new connection, then the Siebel field service job is cancelled and the ICP is decommissioned.

The "Maintenance Breach History Report (RET breaches)" report was examined for the period August 2022 to July 2023. This report contained 2,481 ICPs where the initial registry update was later than two business days out of a total of 2,679 new connections for the same period. The records for 50 ICPs were reviewed where the registry update was more than ten business days late and found:

- Six of the 50 ICPs reviewed were where the proposed retailer had not initially been GENG indicating that the initial new connection request was with another retailer.
- For 44 ICPs, there were internal processing delays resulting in late registry population. The affected ICPs are recorded in Appendix 1.

Non conformance is recorded in **section 2.1.1** of the **Gas Registry and Switching Performance Audit Report** because the registry was not populated within two business days of Genesis Energy entering into an agreement to supply gas to a consumer for the 44 ICPs listed in Appendix 1.

Because of the potential delays with receiving the metering paperwork from the field service agents, for some ICPs where the status has changed to ACTC, consumption information may not be provided to the allocation agent for the initial allocation. I checked 21 ICPs where the update to the registry was later than 30 business days and I found that submission of consumption information to the allocation agent occurred at the next available revision (Interim or Final) for 19 ICPs.

Additionally for two ICPs listed below, the internal processing time to complete both the status update and meter set up in Gentrack / MSD meant some consumption volume was recorded for periods outside the final revision submission window.

ІСР	Retailer status event date	Consumption period first submission performed	Comment
1000602472PG31C	26 May 2022	June 2022	meter installed July 23 for May 2022 - paperwork missed - user error. Identified in New Connections pending report
1000592715PG955	31 March 2022	June 2022	meter installed July 23 for March 2022 - paperwork missed - user error. Identified in New Connections pending report

Non conformance is recorded in Section 5.2.

Genesis Energy has a daily report to identify ICPs at "new" or ready" where they are the proposed retailer. The "RSREADY" report did not identify any ICPs at the ready status where Genesis Energy was the expected retailer confirming that the reporting and supporting process are effective.

#### FRANK ENERGY

The "Maintenance Breach History Report (RET breaches)" report was examined for the period August 2022 to July 2023. This report contained 21 ICPs where the initial registry update was later than two business days out of a total of 29 new connections. The records for 17 ICPs were reviewed where the registry update was more than ten business days late and found for all 17 ICPs the updates did not occur within two business days of entering into a contract to supply gas to the consumer. Frank Energy waited for the confirmation of the meter installation as the trigger to claim the ICP and updating the status to Active – Contracted (ACTC).

The affected ICPs are recorded in Appendix 1 and non conformance is recorded in section 2.1.1 of the Gas Registry and Switching Performance Audit Report because the registry was not populated within two business days of Genesis Energy entering into an agreement to supply gas to a consumer.

Frank Energy no longer perform new connections so no longer actively monitor the registry RSREADY report. The 'RSREADY' report for November 2023 contained six ICPs at GIR (ready) status where Frank Energy was the proposed retailer. A review of the six ICPs identified:

- Three ICPs have now been claimed, meter installed and have active status recorded on the registry, two by Genesis Energy and another of another retailer.
- One ICP remains unclaimed and at READY status.
- Two ICPs (1002079115QT7D1 meter installed 1 July 2023, 1002148326QT20E meter installed 2 July 2023) have meter event records recorded on the registry but remain unclaimed and at READY status.

Non conformance is recorded in **section 6** of the Gas Registry and Switching Performance Audit Report because the registry was not populated within two business days of Frank Energy entering into an agreement to supply gas to a consumer for the six ICPs listed above.

#### 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**, contains the following requirements regarding the way that altitude information should be managed.

- 1. **Table 3 NZS 5259:2015 Maximum permissible errors for conversion (% of conversion)** 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 **section 3.8.2.3 of NZS5259** "Altitude should be determined within 10m where practicable."

The Gentrack / MSD systems are directly updated by the gas registry so that whenever an altitude change is recorded in the registry, this is also reflected in the Gentrack / MSD systems. Genesis Energy also performs annual terrain checks at gas gate level checking any high or low metres above sea level against the gate average.

#### **GENESIS ENERGY**

Altitude values were compared between the registry values and the value held by the MSD system for all ICPs recorded from the registry list as of 4 September 2023. No ICPs were identified as having a difference between the registry value and the MSD system.

A sample of 20 non-TOU ACTC or ACTV ICPs per distributor from the registry list as of 4 September 2023 was selected from a subset of ICPs where the standard deviation of altitude minimum and maximum values by street was more than 10 standard deviations. A further random sample of ten non-TOU ACTC or ACTV ICPs per distributor were also selected.

This sample of ICPs were checked against 'google earth' data. The 'google earth' data is based on the "Shuttle Radar Topography Mission" (SRTM) results and a number of recent studies indicate an accuracy of  $\pm$  10m for altitude. An evaluation against this data is considered an appropriate test for "reasonableness". Altitude figures that are within approximately 90m of the actual altitude will ensure an accuracy of  $\pm$  1.0%.

Section **3.8.2.3** of **NZS5259:2015** recommends altitude figures are determined to within 10m where practicable. An evaluation of altitude data on the registry was conducted to check whether this recommendation had been met. As noted above, the margin of error of the 'google earth' data appears to be approximately  $\pm$  10m, therefore, to allow for this margin, I have checked that the registry data is within 20m of 'google earth' data.

Distributor	Total ACTC and ACTV non TOU ICPs	ICPs checked	Quantity outside 20m	Quantity outside 90m
UNLG	24,863	30	11	-
NGCD	25,598	30	-	-
РОСО	41,507	30	8	1
GNET	3,379	30	-	-
Total	95,747	120	19	-

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

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<sup>2</sup> 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** 

<sup>&</sup>lt;sup>2</sup> Gas (Switching Arrangements) Rules 2008, Part A, ICP parameters maintained by Distributors and rules 41 and 58.

**5259:2015**. There was one altitude discrepancy which resulted in an altitude factor which was outside the threshold (± 1.0%) set out in **NZS 5259:2015**.

ICP	Meter Pressure	Registry ICP Altitude	MSD Altitude	Google Earth Altitude	Altitude factor based on registry value	Altitude factor based on MSD value	Difference in altitude factors
0002288991QT337	1.5	166	166	5	0.980755	0.999420	1.9%

Non conformance is recorded relating to Powerco as the distributor responsible for ensuring accurate altitude data is recorded on the registry for ICP 0002288991QT337.

Auditor comment					
Non-compliance	Descrip	Description			
Report section: 2.1.2 Rule: 26.5.1, 26.5.4 From: 6 August 2014 To: 31 October 2023	Audit history: Yes Controls: Effective Impact: Minor		Powerco is the distributor responsible for ensuring accurate altitude data is recorded on the registry for ICP 0002288991QT337, however the registry altitude value is incorrect when compared to google earth resulting in an altitude factor which was over the maximum permissible error in <b>NZS 5259:2015</b> .		
Remedial action rating	•	Remed	ial timeframe	Remedial comment	
Completed		Resolved		Due to limitations of our ICP management system, any corrections that are made to the elevation are dated the as the date that the correction was made rather be back dated to when the initial error occurred. We have subsequently updated the registry to back date this correction	
Audited party comment					
The circumstances of the matters outlined in the breach notice.		We can confirm that the elevation for this ICP was incorrect and was corrected it on 14 Feb 2024 when we were made aware of it by Genesis. The error was the result of a system update that occurred on 12/6/2015 that incorrectly determined the location of the ICP based on the address			
Whether or not the participant admits or disputes that it is in breach.					
Estimate of the impact of the breaches (where admitted).					
What steps or processes were in place to prevent the breaches?					
What steps have been taken to prevent recurrence?					

A further evaluation was conducted of ICPs where the altitude was zero on the registry. This data historically appears to be less accurate than when a figure other than zero is populated. All 30 ICPs have an altitude difference of less than 20m.

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

Altitude adjustments are applied for TOU ICPs, except where the metering system corrects for absolute pressure. TOU gas conversion was checked for five ICPs with TA, TG or TGS register content codes and I confirmed that the altitude factors were correctly calculated and applied.

Auditor comment						
Non-compliance	Descrip	Description				
Report section: 2.1.2 Rule: 28.2 From: 6 August 2014 To: 31 October 2023	Audit history: Yes Controls: acceptable Impact: Minor		One registry altitude value is incorrect relating to Genesis Energy (GENG) ICP 0002288991QT337 when compared to google earth resulting in an altitude factor which was over the maximum permissible error in NZS 5259:2015.			
Remedial action rating	•	Remed	ial timeframe	Remedial comment		
In progress		Non-Co	ompliance Resolved	The ICP altitude has been corrected		
Audited party comment						
The circumstances of the matters outlined in the breach notice.		The ICP altitude is taken from what the network publishes in the gas registry. This ICP has now been updated via the Network on registry to reflect the correct altitude				
Whether or not the participant admits or disputes that it is in breach.		Genesis accepts this breach				
Estimate of the impact of the breaches (where admitted).		Minor Impact				
What steps or processes were in place to prevent the breaches?		Our processes were to ensure the altitude we had matched what was published in the registry. Altitude checks were completed on an ad hoc basis				
What steps have been taken to prevent recurrence?		A process is currently being established to check altitude against nearby ICPs and Genesis will increase the frequency that we check the accuracy of altitudes				

#### FRANK ENERGY

Altitude values were compared between the registry values and the value held by the MSD system for all ICPs recorded from the registry list as of 4 September 2023. No ICPs were identified as having a difference between the registry value and the MSD system.

Section **3.8.2.3** of **NZS5259:2015** 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	5,508	30	2	-

Distributor	Total ACTC and ACTV non TOU ICPs	ICPs checked	Quantity outside 20m	Quantity outside 90m
NGCD	3,172	30	-	-
РОСО	4,386	30	-	-
GNET	360	30	-	-
Total	31,426	120	2	-

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<sup>3</sup> 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 were no altitude discrepancies which resulted in an altitude factor which was outside the threshold allowed by **NZS 5259:2015**.

A further evaluation was conducted of ICPs where the altitude was zero on the registry. This data historically appears to be less accurate than when a figure other than zero is populated. A further evaluation was conducted of ICPs where the altitude was zero on the registry. This data historically appears to be less accurate than when a figure other than zero is populated. All seven ICPs have an altitude difference of less than 20m.

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

## 2.2 Metering Set-up Information

Genesis Energy has a set of validation checks and processes to identify and resolve discrepancies, which was demonstrated during the audit. The validation checks compare Gentrack / MSD data to registry data for relevant fields.

Aggregation factors (including gas gates) are checked against registry information prior to each submission. The pre submission checks are discussed further in **section 5.2**.

Genesis Energy compares the metering fields against registry metering fields on an ad hoc basis.

#### **GENESIS ENERGY**

#### Meter pressure

Meter pressure is a static field in both Gentrack and MSD recorded against the meter attribute.

The meter pressure field within Gentrack has billing locks applied ensure that this field cannot be amended for any period already billed. Where a pressure change occurs without a physical meter change, or a correction is required from a certain date, Gentrack requires that the "reverse and rebill" process occurs to ensure the change is from the correct date.

Gentrack and registry meter information as of 4 September 2023 was compared and seven differences were identified. All seven were updated as part of BAU and the delays in processing these meter changes was due to late paperwork from the field service agent.

No historical pressure discrepancies were identified by Genesis Energy that occurred during the audit period to assess the time it took to correct these meter pressure values in Gentrack / MSD.

<sup>&</sup>lt;sup>3</sup> Gas (Switching Arrangements) Rules 2008, Part A, ICP parameters maintained by Distributors and rules 41 and 58.

The corrections processed is described in section 3.5.

#### Meter numbers and digits

A review of meter serial numbers between the registry and Gentrack / MSD was conducted and 569 meter number mismatches were identified and a sample of ten were reviewed. All ten exceptions were due to timing issues relating to when the audit registry list file was produced.

A comparison of meter digits between the registry and Gentrack / MSD was conducted and no meter digit mismatches were identified.

#### **Meter multipliers**

A comparison of MSD and registry information as of 4 September 2023 was performed and no multiplier mismatches were identified.

#### Meter types and content codes

Register content codes are not checked for reasonableness against meter content codes for TOU ICPs. A review of TOU register content codes between the TOU meter owners and the Oracle SQL database used for gas TOU submissions was conducted and four exceptions were identified and are listed in the table below.

ICP	Oracle SQL DB register content code	Meter Owner content code	Comment
0000322831QT39A	TG	TA	Altitude factor applied twice – impact to conversion factor assess as 0.027%. Assessed annual volume impact of 37.5 GJ pa
1001294166NGCC4	TG	ТА	Altitude factor applied twice - impact to conversion factor assess as 0.074% exceeding maximum permissible error of +/- 0.5%Assessed annual volume impact of 38.38 GJ pa
0004226830NG91E	TG	TA	Altitude factor applied twice – impact to conversion factor assess as 0.005%. Assessed annual volume impact of 0.22 GJ pa
0008000080NG849	TG	ТА	Altitude factor applied twice – impact to conversion factor assess as 0.010%. Assessed annual volume impact of 53.46 GJ pa

Non conformance is recorded in **section 4** regarding the double application of the altitude factor for the ICPs listed above.

Recommendation	Audited party comment
Implement process to regularly compare meter equipment owner records of the corrector function to The Oracle SQL database register content code for the ICP to ensure alignment and correct application of gas factors.	Response: We agree with this recommendation Comments: We have established a process to compare register content codes and training has been provided to our GTOU team

#### FRANK ENERGY

#### Meter pressure

Meter pressure is a static field in both Gentrack and MSD recorded against the meter attribute.

The meter pressure field within Gentrack has billing locks applied ensure that this field cannot be amended for any period already billed. Where a pressure change occurs without a physical meter change, or a correction is required from a certain date, Gentrack requires that the "reverse and rebill" process occurs to ensure the change is from the correct date.

Gentrack and registry meter information as of 4 September 2023 was compared and one difference was identified. The Meter pressure update was processed as part of BAU and the delay in processing this meter change was due to late paperwork from the field service agent.

No historical pressure discrepancies were identified by Frank Energy that occurred during the audit period to assess the time it took to correct these meter pressure values in Gentrack / MSD.

#### Meter numbers and digits

A review of meter serial numbers between the registry and Gentrack / MSD was conducted and 105 meter number mismatches were identified and a sample of ten were reviewed. All ten exceptions were due to timing issues relating to when the audit registry list file was produced.

A comparison of meter digits between the registry and Gentrack / MSD was conducted and no meter digit mismatches were identified.

#### Meter multipliers

A comparison of MSD and registry information as of 4 September 2023 was performed and no multiplier mismatches were identified.

#### Meter types and content codes

I compared the MSD metering information to the registry list as of 4 September 2023 and no differences were identified.

#### 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.

#### **GENESIS ENERGY**

Genesis Energy has chosen option (c) and uses the GIC's published monthly average temperatures for each gas gate. Option (c) seems to be the most logical choice because it matches the majority of GMS installations.

A comparison of the GIC published ground temperatures for January to December to the MSD ground temperatures recorded for January 2022 to December 2022 for all allocated gas gates and confirmed that they 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 0.5<sup>o</sup> 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.

The formula applied in MSD to calculate the temperature factor was reviewed and tested for five non TOU ICPs in **section 4** and both the review and testing confirmed that Joule-Thomson effect is not being applied to submission volumes. An assessment of the temperature factor accuracy was performed across all Genesis Energy active ICPs. 144 ICPs were identified as having temperature factor values outside the maximum permissible error ( $\pm$  0.9%) due to the non application of the Joule-Thomson Effect when calculating the temperature. The annual impact across the 144 ICPs was assessed as being approximately 892 GJ.

The affected ICPs are recorded in Appendix 1 and non conformance is recorded in section 4.

While only 144 ICPs did not meet the maximum permissible errors requirement of NZS5259:2015, the overall impact of 95,747 ICPs where the Joule-Thomson Effect is not being applied was assessed in terms of its contribution to UFG due to small increments of under submission at ICP level. The annual assessment of the impact of Joule-Thomson effect not being applied was calculated to be approximately 11.8TJ. The top 25 ICPs accounts for 1.1TJ of this impact and the top 500 ICPs accounts for 3.9TJ.

#### Network pressure

Network pressure values were compared between the registry values and the value held by the Gentrack / MSD systems for all ICPs recorded from the registry list as of 4 September 2023. No ICPs were identified as having a difference between the registry value and the Gentrack / MSD systems.

#### Gas gate

Gas Gate assignment for all active ICPs were compared between the registry values and the value held by the Gentrack / MSD systems for all ICPs recorded from the registry list as of 4 September 2023. No ICPs were identified as having a difference between the registry value and the Gentrack / MSD systems.

#### FRANK ENERGY

Frank Energy also applies option (c) and uses the GIC's published monthly average temperatures for each gas gate. Option (c) seems to be the most logical choice because it matches the majority of GMS installations.

A comparison of the GIC published ground temperatures for January to December to the MSD ground temperatures recorded for January 2022 to December 2022 for all allocated gas gates and confirmed that they 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 0.5<sup>o</sup> 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.

The formula applied in MSD to calculate the temperature factor was reviewed and tested for five non TOU ICPs in **section 4** and both the review and testing confirmed that Joule-Thomson effect is not being applied to submission volumes. An assessment of the temperature factor accuracy was performed across all Frank Energy active ICPs. Seven ICPs were identified as having temperature factor values outside the maximum permissible error ( $\pm$  0.9%) due to the non application of the Joule-Thomson Effect when calculating the temperature. The annual impact across the seven ICPs was assessed as being approximately 1.05GJ.

The affected ICPs are recorded in **appendix 1** and non conformance is recorded in **section 4**.

While only seven ICPs did not meet the maximum permissible errors requirement of NZS5259:2015, the overall impact of 13,426 ICPs where the Joule-Thomson Effect is not being applied was assessed in terms of its contribution to UFG due to small increments of under submission at ICP level. The annual assessment of the impact of Joule-Thomson effect not being applied was calculated to be approximately 977GJ.

#### Network pressure

Network pressure values were compared between the registry values and the value held by the Gentrack / MSD systems for all ICPs recorded from the registry list as of 4 September 2023. No ICPs were identified as having a difference between the registry value and the Gentrack / MSD systems.

#### Gas gate

Gas Gate assignment for all active ICPs were compared between the registry values and the value held by the Gentrack / MSD systems for all ICPs recorded from the registry list as of 4 September 2023. No ICPs were identified as having a difference between the registry value and the Gentrack / MSD systems.

#### **2.3.2** Calorific Values

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

The accuracy of the gas composition information was confirmed by comparing an OATIS file with the contents of MSD for 1 August 2022 to 31 July 2023.

## 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 was confirmed that Genesis Energy securely archives data for a period in excess of 30 months.

Some data provided by Genesis Energy and Frank Energy's meter reading contractor was checked, and it was found that the readings matched the data in Gentrack / MSD. This proves the end-to-end process.

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

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

All ACTC and ACTV ICPs had a value recorded in their allocation group on the registry. Allocation groups are assigned based on the expected or actual annual load for the ICP and their metering. Allocation groups are not updated as part of switch gain and users know to assign to monthly read rounds to recently gained allocation group 4 ICPs.

Ad hoc reporting is in place based on consumption bands to identify ICPs with the incorrect allocation group.

#### GENESIS ENERGY and FRANK ENERGY

The August 2023 analysis by Genesis Energy found the following:

- 190 Genesis Energy (GENG) allocation group 6 ICPs had estimated annual consumption exceeding 250GJ and 171 ICPs were updated to allocation group 4.
- 226 Genesis Energy (GENG) allocation group 4 ICPs had estimated consumption under 250GJ per annum and 171 ICPs were updated to allocation group 6.
- 13 Frank Energy (GEOL) allocation group 6 ICPs had estimated annual consumption exceeding 250GJ and one ICP was updated to allocation group 4.
- Ten Frank Energy (GEOL) allocation group 4 ICPs had estimated consumption under 250GJ per annum and all ten ICPs were updated to allocation group 6

The allocation group monitoring report is run and reviewed on an ad hoc basis and has only been run once in the last 12 months in preparation for the audit. Where there is sufficient read and consumption history to confirm that an allocation group change is required this then the allocation group is updated on the registry and a request to the meter reading provider is made to update the

meter read frequency. A recommendation is recorded in **section 8** of the **Registry and Switching Performance audit report** to increase the frequency of running this report.

A further review of annualised consumption values provided by Genesis Energy for all non TOU ICPs identified a further nine Genesis Energy (GENG) allocation group 4 ICPs with annualised consumption below 250 GJ that did not appear on the exception report for investigation and revision of the allocation group assignment.

Recommendation	Audited party comment
Review the selection criteria of the allocation group exception report to ensure all ICP exceptions ae identified for review.	<b>Response</b> : We agree with this recommendation <b>Comments</b> : Genesis will review the current selection criteria to ensure all exceptions are identified.

As discussed in **section 3.3**, Genesis Energy has a process to monitor read attainment for non TOU ICPs. This process is designed around the Allocation group 6 requirements of ensuring at least one read every 12 months unless exceptional circumstances prevent such an interrogation.

For Allocation group 4 ICPs the read attainment requirements are that all ICPs must have register readings recorded monthly. Exceptional circumstances do not apply to allocation group 4 ICPs. Genesis Energy does not apply a separate meter reading escalation process for allocation group 4 ICPs to ensure any unread ICPs are escalated immediately to attempt to resolve the issue impacting read attainment. Analysis of the allocation group 4 submission volumes relating to final GAS040 revisions for April, May and June 2022 identified forward estimate volumes present for 32 gas gates as listed in the tables below.

Gas Gate	April 2022 FE volume	May 2022 FE volume	June 2022 FE volume
BEL24510	241.743	418.039	1,530.358
BMC17901	32.918	69.166	40.773
DAN05001		33.335	50.234
FLD03001			162.945
GIS07810	32.648		
HEN74101	192.43	295.367	480.098
HST05210	4.279	5.34	702.015
HTK08301	706.454	423.763	686.846
HTV11301	1,553.672	495.709	1,045.604
LVN24401	19.09		
MMU08001	126.254	79.729	
MRV16302	61.595		142.688
NPL12101			246.537
PAH23201	0.328		6.246
PAP06610	389.881	431.692	41.307
PLN24201	573.141	13.436	805.159

#### **GENESIS ENERGY**

Gas Gate	April 2022 FE volume	May 2022 FE volume	June 2022 FE volume
PPA33201	176.672		
PTR32601		109.043	
ROT08101	316.39	34.512	270.449
TAU07001	170.25	10.944	
TAW31004	665.53		
TKN17001			292.807
TKR19701	338.567		699.737
TPK33301	1.627		109.72
TRG07701	128.598	38.192	7.171
TWA35610	221.459	462.218	557.582
WHG07501		93.783	
WKM17701	32.212	64.399	
WST03610	216.464	361.971	353.904
WTA16501	4.414		
WTG06910	295.494	30.37	611.343
WTR12001	304.911		

The total volume of forward estimate volumes as of the final revision for April, May and June 2022 was assessed and is summarised in the table below.

Consumption period	AG4 submission volume	AG4 Forward Estimate volume	% FE
Apr-22	84,829.011	6,807.021	8.02%
May-22	115,610.713	3,471.008	3.00%
Jun-22	126,542.136	8,843.523	6.99%

The volume of forward estimate remaining at the final revision compared to the total allocation group 4 submission volumes is relatively large at approximately 19 TJ across these three consumption periods. The presence of FE at final revision confirms the current read attainment process is not adequate for allocation group 4 ICPs.

#### FRANK ENERGY

Gas Gate	June 2022 FE volume	
HEN74101	3.377	

The total volume of forward estimate volumes as of the final revision for April, May and June 2022 was assessed and is summarised in the table below.

Consumption period	AG4 submission volume	AG4 Forward Estimate volume	% FE
Apr-22	130.471	130.471	0%
May-22	178.627	178.627	0%
Jun-22	218.400	3.377	1.55%
The volume of forward estimate remaining at the final revision compared to the total allocation group 4 submission volumes is relatively small for June 2022 at approximately 3.377 GJ. The presence of FE at final revision confirms the current read attainment process is not adequate for allocation group 4 ICPs.

Recommendation	Audited party comment
Review read attainment process for allocation group 4 ICPs to ensure any meter read attainment issues are escalated and resolved as soon as possible.	<b>Response</b> : We agree with this recommendation <b>Comments</b> : A monthly process is currently being established for this
Review outstanding allocation group 4 forward estimate volumes for interim revisions as a measure of the reading performance for allocation group 4 ICPs and ensure the read issues impacting these ICPs are resolved prior to final revisions.	<b>Response</b> : We agree with this recommendation <b>Comments</b> : All group 4 outstanding forward estimates will be reviewed as part of the above process that is being established

Auditor comment				
Non-compliance	Descriptio	Description		
Report section: 3.2 Rule: 29.2.2 From: 1 January 2022 To: 31 July 2023	Audit history: Yes Controls: Acceptable Impact: Insignificant		<ul> <li>171 Genesis Energy (GENG) ICPs with annualised consumption over 250 GJ incorrectly assigned to Allocation group 6.</li> <li>One Frank Energy (GEOL) ICP (0002028507NG9A5) with annualised consumption over 250 GJ was incorrectly assigned to Allocation group 6 during the audit period.</li> </ul>	
Remedial action rating		Remedia	l timeframe	Remedial comment
Completed R		Resolved		The allocation group for these non-compliant ICPs have been updated
Audited party comment				
The circumstances of the matters outlined in the breach notice.		The consumption report was only run every 6 months and ICP moved between allocation groups		
Whether or not the participantGenesiadmits or disputes that it is inbreach.		Genesis a	accepts this breach	
Estimate of the impact of the Insign breaches (where admitted).		Insignific	ant	
What steps or processes were in place to prevent the breaches?Current those alloc		Currently those ICF allocation	<ul> <li><i>i</i>, as the criteria is 250gj p,</li> <li><i>i</i>'s above or below this with groups</li> </ul>	/a, the report is set up to identify the incorrectly corresponding gas

What steps have been taken to prevent recurrence?	Recently, the process of sending lists of ICP's to our meter readers has been updated so all future requests are sent more frequently and directly to our relationship manager. We are also building an automated monthly report to review annual consumption and move ICP between allocation groups accordingly.
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Auditor comment				
Non-compliance	Description			
Report section: 3.2 Rule: 29.3 From: 1 January 2022 To: 31 July 2023	Audit history: Yes Controls: Needs Improvement Impact: Insignificant		171 Genesis Energy (GEN consumption under 250 Allocation group 4. Ten Frank Energy (GEOL) consumption under 250 Allocation group 4 durin	NG) ICPs with annualised GJ incorrectly assigned to ) ICPs with annualised GJ were incorrectly assigned to g the audit period.
Remedial action rating		Remedia	l timeframe	Remedial comment
Completed	Resolved		I	The allocation group for these non-compliant ICPs have been updated
Audited party comment				
The circumstances of the matters outlined in the breach notice.		The consumption report was only run every 6 months and ICP moved between allocation groups		
Whether or not the participant admits or disputes that it is in breach.		Genesis accepts this breach		
Estimate of the impact of the breaches (where admitted).		Insignificant		
What steps or processes were in place to prevent the breaches?		Currently, as the criteria is 250gj p/a, the report is set up to identify those ICP's above or below this with incorrectly corresponding gas allocation groups		
What steps have been taken to R prevent recurrence? re fr a cu a		Recently, the process of sending lists of ICP's to our meter readers has been updated so all future requests are sent more frequently and directly to our relationship manager. We are also building an automated monthly report to review annual consumption and move ICP between allocation groups accordingly.		

# 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.

### **GENESIS ENERGY**

The GAS080 report is created in Gentrack. Genesis Energy run a No Read ICP list report to monitor ICPs with potential read attainment issues.

The June 2023 GAS080 ICP level detail report was compared to the registry list with history for the 1 June 2023 to 30 June 2023. the GAS080 report has 577 ICP unread for 12 months, however the No Read ICP list report for July 2023 only had 153 ICPs recorded. The difference between the two reports was investigated and was identified that the No Read ICP list report selection criteria only select ICPs with ACTC registry status meaning active vacant ICPs (ACTV) are not monitored by the no read process.

Recommendation	Audited party comment
Review the selection criteria of the No Read ICP List exception	<b>Response</b> : We agree with this
report to ensure all active ICPs (ACTC and ACTV registry status)	recommendation
with no reads for 12 months are included and the registry	<b>Comments</b> : Report to be reviewed to
allocation group and status is also reported to allow users to	ensure all ICPs are included and that there
prioritise next steps.	are no exclusions

A sample of 15 exceptions from the No Read ICP list report were reviewed and found:

- For eight ICPs that have switched back to Genesis Energy are a period with another retailer, the exception report is incorrectly reporting the ICP as not read for over 12 months.
- One ICP has successfully returned an actual read.
- No current consumer is recorded against four ICPs resulting in no contact details available for Genesis to send access requests to. The meter readers notes for one ICP (0075001406PG160) has recorded a dog on site indicating the property is occupied.
- For two account managed ICPs (0002320141QT1FC, 0000037751QT010) with site access issues, the customers were contacted and readings were eventually obtained.

To confirm compliance with the meter reading frequency rules, Genesis Energy provided a copy of the GAS080 report for April, May and June 2023.

Target	Rolling 4 months (target 90%)	12 months (target 100%)
Apr-2023	97.80%	99.41%
May-2023	97.97%	99.44%
Jun-2023	98.04%	99.34%

Allocation Group 6 ICPs traditionally have Bi monthly read cycles applied for during the audit period. The ICPs assigned to these read cycles have been reducing during the audit period with the installation of 70,000 gas advanced meters (65% active ICPs) during the audit period resulting in monthly actual reads being applied for both billing and submission purposes.

Allocation group 4 ICPs consumer installations with non-TOU meters must have validated register readings recorded monthly. Exceptional circumstances do not apply to allocation group 4 ICPs. Genesis Energy does not apply a separate meter reading escalation process for allocation group 4 ICPs to ensure any unread ICPs are escalated immediately to attempt to resolve the issue impacting read attainment. In **section 3.2**, allocation group 4 submission volumes relating to final GAS040 revisions for April, May and June 2022 identified that forward estimate volumes were present.

### FRANK ENERGY

The GAS080 report is created in Gentrack. Genesis Energy run a No Read ICP list report to monitor ICPs with potential read attainment issues.

The June 2023 GAS080 ICP level detail report was compared to the registry list with history for the 1 June 2023 to 30 June 2023. the GAS080 report has 206 ICP unread for 12 months, however the No Read ICP list report for July 2023 only had 104 ICPs recorded. The difference between the two reports was investigated and was identified that the No Read ICP list report selection criteria only select ICPs with ACTC registry status meaning active vacant ICPs (ACTV) are not monitored by the no read process.

A sample of 14 exceptions from the No Read ICP list report were reviewed and found:

- For one ICP that has switched back to Genesis Energy are a period with another retailer, the exception report is incorrectly reporting the ICP as not read for over 12 months.
- For two ICPs the customer was emailed to request access to obtain a meter read.
- No current consumer is recorded against nine ICPs resulting in no contact details available for Genesis to send access requests to. The meter reader notes for four ICPs has recorded a dog on site indicating the property is occupied.
- For two ICPs (0004209354NG447, 0003008054NG71C) with site access issues, no further action was taken in addition to scheduled meter read attempts to attempt to obtain a meter register read. The meter read compliance process was not followed and the best endeavours requirement was not met for these two ICPs.

To confirm compliance with the meter reading frequency rules, Genesis Energy provided a copy of the GAS080 report for April, May and June 2023.

Target	Rolling 4 months (target 90%)	12 months (target 100%)
Apr-2023	95.82%	98.21%
May-2023	96.04%	98.17%
Jun-2023	96.31%	98.07%

Allocation group 4 ICPs consumer installations with non-TOU meters must have validated register readings recorded monthly. Exceptional circumstances do not apply to allocation group 4 ICPs. Genesis Energy does not apply a separate meter reading escalation process for allocation group 4 ICPs to ensure any unread ICPs are escalated immediately to attempt to resolve the issue impacting read attainment. In **section 3.2**, allocation group 4 submission volumes relating to final GAS040 revision for June 2022 identified that forward estimate volumes were present.

As part of the read attainment process, meter readers are able to escalate potential issues with the meter using meter conditions codes which map to a standard set of meter issues. A sample of two meter condition codes provided by the meter reading agent were reviewed to see what actions have been undertaken by Genesis Energy to investigate the reported issue.

ICP	Date	Meter Number	No read code	MR notes	Action taken	No Read ICP list report
0001020352NGC2F	5/10/2023	02EW8964	VO – View obscured	View Obscured - cannot see the meter number as numbers pointing upwardstried to unscrew cover but	No action taken	no
1000540005PG3EB	21/9/2023	12P12351	VO – View obscured	View Obscured - meter has been damaged and needs replacing please refer to photo	No action taken	yes

Recommendation	Audited party comment
Ensure all reported gas meter condition codes are investigated in a timely manner to support the read attainment processes.	<b>Response</b> : We agree with this recommendation <b>Comments</b> : A monthly report is in place to review any notes we get back from our contractors regarding the condition of the meter.

Auditor comment				
Non-compliance	Description			
Report section: 3.3 Rule: 29.4.2 From: 1 October 2020	Audit history: No Controls: Needs Improvement Impact: Minor		Some Genesis Energy (GENG) allocation group 4 ICPs have not been successfully read monthly. Analysis of the allocation group 4 submission volumes relating to final GAS040 revisions for April (6.8 TJ), May (3.5 TJ) and June 2022(8.8 TJ) identified that forward estimate volumes were present. Genesis Energy and Frank do not have a separate no read escalation process for allocation group 4 ICPs resulting in the allocation group 6 process being applied to try and obtain one read each 12 months instead of escalating the access issue after one missed read.	
To: 31 October 2023				
			Some Frank Energy (GEOL) allocation group 4 ICPs have not been successfully read monthly. Analysis of the allocation group 4 submission volumes relating to final GAS040 revision for June 2022 (3.377 GJ) identified that forward estimate volumes were present.	
			For two Frank Energy (GEOL) ICPs (0004209354NG447, 0003008054NG71C) Exceptional circumstances do not apply as no action beyond scheduled meter reads was attempted.	
Remedial action rating		Remedia	l timeframe	Remedial comment
In progress		Septemb	er 2024	Band 4 escalation process to be established
Audited party comment				
The circumstances of the matters outlined in the breach notice.No acces prioritise		ss process in place but allocation group 4 ICPs are not ed as part of this		
Whether or not the partici admits or disputes that it i breach.	pant s in	Genesis	accepts this breach	
Estimate of the impact of the Minor breaches (where admitted).		Minor		

What steps or processes were in place to prevent the breaches?	We have a process (No Access) for investing ICPs we have been unable to read
What steps have been taken to prevent recurrence?	No access report to be updated to prioritise allocation group 4 ICP that we have not been able to obtain a reading for.

# 3.4 Non-TOU Validation

Meter reading validation occurs at multiple levels.

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

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

The second level of validation occurs when the data reaches Genesis. This validation looks for obvious file errors or file corruption and invalid metering information.

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

- Short read period.
- Long read period.
- High dollar amount.
- Zero consumption.
- Negative consumption.
- Consumption on inactive and vacant premises.

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

### 3.5 Non-TOU Error Correction

The process for error correction was examined by a "walk through" of the process to ensure that corrected consumption is included in the revision process and provided to the allocation agent.

### GENESIS ENERGY

### Stopped or faulty meters

Where a meter is found to have stopped an estimated removal reading is calculated using 'Gas New Calculations spreadsheet' which uses consumption history from either, a historic consumption period or from the new installed meter to derive an appropriate adjusted removed meter read estimate which adds the estimated unrecorded volume to the removal reading recorded on the meter. This estimated removed meter read is then entered in Gentrack / MSD. This process results in consumption information appearing in the relevant revision files.

13 examples of gas stopped meters identified by Genesis Energy during the audit period. Eight were reviewed and found:

• The calculation correctly calculated an appropriate removed meter read estimate to account for the unrecorded volume for the affected period of the stopped meter for five ICPs.

• For three ICPs (0001411469QT5F4, 1001113175QTB9E, 1002047747QT0B6) the calculation was incorrect as the user applied an incorrect number of affected days the removed meter had stopped for by using the number of days from the new meter reference period used to determine an appropriate average daily consumption for use in the calculation.

Recommendation	Audited party comment
Review the format of the spreadsheet template 'Gas New Calculations spreadsheet' to ensure users are not able to incorrectly apply an incorrect number of affected days for the stopped meter volume calculation.	<b>Response</b> : We agree with this recommendation <b>Comments</b> : This spreadsheet has not been updated and cells protected
Investigate implementing a peer review process to the stopped meter volume correction process to ensure the calculation steps and data inputs are correct in every case.	<b>Response</b> : We agree with this recommendation <b>Comments</b> : The Exceptions team now have a peer review process in place. This is then sent through to Market Settlements for further review before submissions.

#### Meter pressure corrections-

As recorded in **section 2.2**, the meter pressure field within Gentrack has billing locks applied ensure that this field cannot be amended for any period already billed. Where a pressure change occurs without a physical meter change, or a correction is required from a certain date, Gentrack requires that the "reverse and rebill" process occurs to ensure the change is from the correct date.

Error correction was examined by a "walk through" of the process and by examining a sample of the five ICPs the meter pressure was corrected. For all meter pressure corrections provided, Gentrack / MSD was updated to match the registry meter pressure and the correction aligned with the registry metering event date.

### Inactive status corrections

Consumption is reported for all ICPs which have an active status. Genesis Energy provided a copy of the inactive consuming report listing 311 ICPs with inactive consumption. This report is an operational report of current Genesis Energy ICPs where the current Gentrack status is INACT or INACP. The report does not include any historic records of previous inactive periods where consumption was detected.

A sample of ten were reviewed and found:

- For four ICPs an active status update had been applied to the registry for the inactive consumption period.
- For six ICPs (0001515181QTAB3 5.48 GJ, 1001110193QT24B 4.17 GJ, 0054229465PGDEA 3.84 GJ, 1001108670QTED2 3.8 GJ, 1000611527PG55E 2.81 GJ, 1000593610PGCBE 1.91 GJ), no corrections have been applied. Genesis Energy had identified that the automated reporting queue functionality stopped working for approximately a month in Sept 2023. The report has now been fixed and once three actual reads are received for these affected ICPs then a user will investigate the inactive consumption.

#### FRANK ENERGY

#### Stopped or faulty meters

Two examples of gas stopped meters identified by Genesis Energy during the audit period. both were reviewed and found that the calculation correctly calculated an appropriate removed meter read estimate to account for the unrecorded volume for the affected period of the stopped meter.

#### Meter pressure corrections-

As recorded in **section 2.2**, the meter pressure field within Gentrack has billing locks applied ensure that this field cannot be amended for any period already billed. Where a pressure change occurs without a physical meter change, or a correction is required from a certain date, Gentrack requires that the "reverse and rebill" process occurs to ensure the change is from the correct date.

Error correction was examined by a "walk through" of the process and by examining a sample of the three ICPs the meter pressure was corrected. For all meter pressure corrections provided, Gentrack / MSD was updated to match the registry meter pressure and the correction aligned with the registry metering event date.

#### Inactive status corrections

Consumption is reported for all ICPs which have an active status. Genesis Energy provided a copy of the inactive consuming report listing 41 ICPs with inactive consumption. This report is an operational report of current Genesis Energy ICPs where the current Gentrack status is INACT or INACP. The report does not include any historic records of previous inactive periods where consumption was detected.

A sample of ten were reviewed and found:

- For five ICPs an active status update had been applied to the registry for the inactive consumption period.
- For three ICPs (1002062624QT46F 0.515 GJ, 1000611977PG15A 0.454 GJ, 1002165386QT9FC 0.331 GJ), no corrections have been applied. Genesis Energy had identified that the automated reporting queue functionality stopped working for approximately a month in Sept 2023. The report has now been fixed and once three actual reads are received for these affected ICPs then a user will investigate the inactive consumption.

• For two ICPs (1000541054PG606 – 1.26 GJ, 1000518325PG3C9 – 1.11 GJ), The ICPs switched away before any investigations or registry status updates were performed by Frank Energy. These ICPs no longer appear on the inactive consuming report.

Recommendation	Audited party comment
Investigate amending the inactive consuming report to include all inactive periods where Frank Energy is recorded as the retailer and where inactive consumption is detected for each of these ICP tenue periods.	<b>Response</b> : We agree with this recommendation <b>Comments</b> : Inactive consuming report to be reviewed.

Auditor comment						
Non-compliance	Descriptio	Description				
Report section: 3.5 Rule: 26.2 From: 5 December 2021 To: 31 August 2023	Audit history: No Controls: Needs improvement Impact: Minor		The volume correction for three Genesis Energy (GENG) stopped meter ICPs (0001411469QT5F4, 1001113175QTB9E, 1002047747QT0B6) the calculation was incorrect as the user applied an incorrect number of affected days the removed meter had stopped. For six Genesis Energy (GENG) inactive consuming ICPs			
			GJ, 10001515181QTAB3 – 5.4 GJ, 0054229465PGDEA – GJ, 1000611527PG55E – GJ), no corrections have	48 GJ, 1001110193QT24B – 4.17 - 3.84 GJ, 1001108670QTED2 – 3.8 - 2.81 GJ, 1000593610PGCBE – 1.91 been applied		
		For three Frank Energy (GEOL) ICPs (1002062624 0.515 GJ, 1000611977PG15A – 0.454 GJ, 1002165386QT9FC – 0.331 GJ), no corrections ha applied.				
			For two Frank Energy (GEOL) ICPs (1000541054PG606 – 1.26 GJ, 1000518325PG3C9 – 1.11 GJ), The ICPs switched away before any investigations or registry status updates were performed.			
Remedial action rating		Remedial timeframe		Remedial comment		
In progress		Resolved		Peer review process has been established		
Audited party comment						
The circumstances of the r outlined in the breach noti	natters ice.	Volume o	olume corrections were incorrectly calculated			
Whether or not the participantGenesadmits or disputes that it is inbreach.		Genesis a	enesis accepts this breach			
Estimate of the impact of the M breaches (where admitted).		Minor	Minor			
What steps or processes were in place to prevent the breaches?Calculat actual c		Calculatio actual co	ions were conducted for stopped meters to estimate the onsumption while the meter was not recording consumption			
What steps have been take prevent recurrence?	en to	The Exce through submissio	Exception have a peer review process in place. This is then sent ough to Market Settlements for further review before missions.			

## 3.6 TOU Validation

Genesis Energy supplies 64 Allocation Group 1 ICPs and 74 Allocation Group 2 ICPs.

TOU data is collected from all Allocation Group 1 ICPs by Vector Data Services, who perform data validation checks, time monitoring / synchronisation and also performs meter health checks using the meter event logs. Where any issues are identified, then Vector Data Services deals directly with the respective meter owner. Genesis Energy is not involved in the escalation process and is also not advised when a time correction is performed on any ICP. Appendix B of **NZS5259:2015** provides guidance on the accuracy requirements for the time parameter of time stamped data which records a threshold of ± 300 seconds.

Vector Data services also provides D+1 daily data to the allocation agent on behalf of Genesis Energy including any estimations where a device fails to communicate.

Recommendation	Audited party comment
Work with the TOU data collectors to implement a notification	<b>Response</b> : We agree with this
process for time corrections greater than ± 300 seconds enable	recommendation
Genesis Energy to review the TOU data and determine if a data	<b>Comments</b> : Genesis will investigate this
correction is also required.	recommendation

For Allocation Group 2 ICPs, TOU data is collected from NGCM metered ICPs by Vector data services, from POCO metered ICPs by Powerco and from Nova metered ICPs by Nova Energy. Vector data Services, Powerco and Nova perform monthly meter health checks using the meter event logs. A check of clock time occurs in the field and is checked as part of the periodic accuracy checks.

All TOU data files are then formatted and imported into the Oracle SQL database where the volume to energy conversion process and aggregation from hourly data to daily data is undertaken.

For allocation group 1 ICPs the daily energy volumes are compared to the D+1 data provided by Vector data Services as part of the data integrity checks.

All the daily TOU data for the consumption period and each ICP is viewed via a visual tool to look for anomalies.

Prior to submission of the GAS050 file, it is run through a database to ensure file format is correct and daily volumes are reasonable.

# 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 a spreadsheet and the resulting energy value was compared to that calculated by MSD.

### Genesis Energy (GEND)

### **TOU Energy Consumption Calculation**

The TOU process for calculating energy was reviewed. It starts with a CSV data logger file which is imported into an Oracle SQL database. A query is then run to align units of measure and then there is another which performs the volume energy calculation.

The conversion of raw TOU data volumes to energy within MSD and differs based on the register content code. All Genesis Energy's TOU meters have TA (temperature and absolute pressure corrected), TG (temperature and gauge pressure corrected) or TGS (temperature, gauge pressure and super compressibility corrected) register content codes. Register content codes are not reviewed on a regular basis for TOU ICPs. A recommendation is recorded in **section 2.2**.

- Altitude factors are calculated where the register content code in the Oracle SQL database is TG or TGS.
- Compressibility factors are calculated and applied for all TOU ICPs where the register content code is TG or TA. The Oracle SQL database uses the NX19 methodology to calculate compressibility.

The register content for a sample of seven ICPs were compared against the meter owner's information and four ICPs (0000322831QT39A, 0004226830NG91E, 1001294166NGCC4, 0008000080NG849) the register content did not match the meter owner's information. Genesis Energy have been applying a default register content for all TOU gas ICPs of TG.

I checked the TOU conversion process by reperforming the conversion process for a sample of four ICPs with a mix of TA and TG, and register content codes for March 2023 and found:

- For two ICPs (0000322831QT39A, 0008000080NG849) the daily volume to energy conversion factors were confirmed to be within the maximum permissible errors set out in NZS 5259:2015.
- For ICP 1001294166NGCC4, the additional application of the altitude factor to volumes already adjusted for altitude within the corrector resulted in the altitude factor being outside the maximum permissible errors (±0.5%) set out in NZS 5259:2015. The impact of this error was assessed to be 0.74% or 38.38 TJ per annum.
- For ICP 0004226830NG91E, the difference between the reported energy consumption and the independently calculated energy consumption was found to be 4.41% (impact 5.92 GJ). As recorded above, Genesis Energy were incorrectly applying the altitude factor where the volumes were already adjusted for altitude by the corrector. The % error calculated from this incorrect application of altitude factor was calculated to be only 0.005% so is not the cause of the error identified. Genesis Energy have investigated and identified that the process to format the received interval TOU data file from the TOU data collector had missed a manual step to run one of the Oracle SQL scripts that converts the meter pressure received in BAR to kPa as part of the upload process into the Oracle SQL database. Genesis Energy's investigations also identified that this conversion step (BAR to kPa) was also missed for this ICP for February (impact 3.62 GJ) and April 2024 impact 5.69 GJ). The maximum permissible errors exceed ±0.5% as set out in NZS 5259:2015.

Recommendation	Audited party comment
Review all Gas TOU ICPs, for all available revision consumption periods, that require meter pressure conversions from BAR to kPa to ensure all upload data in the Oracle SL database has the correct meter pressures used for submission and also billing.	Response: We agree with this recommendation Comments: This review has been completed and process in place to review on a regular basis
Investigate implementing a monthly check for all ICPs that require the manual processing to the SQL script to convert meter pressure from BAR to kPa to ensure gas TOU energy volumes will be correctly calculated for billing and submission purposes.	<b>Response:</b> Genesis agrees with this recommendation <b>Comments:</b> Genesis will review this recommendation

### Genesis Energy (GENG) and Frank Energy (GEOL) Non-TOU Energy Consumption Calculation

The previous audit identified that the MSD system that converts volume to energy for submission purposes does not use any of the methodologies listed in **NZS 5259:2015** section 3.8.2.4 (AGA 8, AGA NX19 or ISO 12213) to calculate compressibility. While most ICPs have meter pressures below 50 kPa so are not required by **NZS 5259:2015** to have compressibility factor applied, there are a small number of ICPs where the meter pressure is above 50 kPa where the compressibility factor is required to be calculated by one of the three listed methodologies. MSD continues to calculate the compressibility factor using a method not recognised by **NZS 5259:2015**.

I recalculated the conversion factors that would have applied had conversion occurred for the read to read period for seven ICPs.

Testing confirmed that the MSD system is calculating pressure and altitude factors correctly for non-TOU ICPs.

The formula in the MSD system for calculating the temperature factor was reviewed and tested and found that the temperature factor calculation only uses the GIC monthly temperature recorded in MSD as at the 'meter read to' date rather than an average temperature calculated across the read to read period. Section 3.8.2 of **NZS5259:2015** includes a note that states 'the period over which a particular temperature value is applied should take into account seasonal usage patterns, and reflect conditions over the billing period, a season or a full year as appropriate'. The use of a single temperature value to calculate the temperature factor for deriving submission energy volumes does not comply with **NZS 5259:2015**. This issue affects all active non TOU ICPs by varying amounts across the respective read to read periods. The method for calculating the temperature factor used by Gentrack for deriving billing energy volumes was also checked and confirmed that Gentrack does correctly calculate a billing period average temperature factor for used in the conversion of volume to energy.

As discussed in **section 2.3.1**, the temperature factor calculation also does not include an adjustment for Joule-Thomson effect. The impact of this was assessed as:

- 144 Genesis Energy (GENG) ICPs across 20 gas gates where the impact of not applying the Joule-Thomson effect to the temperature factor calculation results in the temperature factor being outside the maximum permissible error or ± 0.9% set out in NZS 5259:2015.
- Seven Frank Energy (GEOL) ICPs across five gas gates where the impact of not applying the Joule-Thomson effect to the temperature factor calculation results in the temperature factor being outside the maximum permissible error or ± 0.9% set out in NZS 5259:2015
- 95,792 active Genesis Energy (GENG) ICPs with an overall under submission / underbilling of approximately 11.8 TJ per annum.
- 13,486 Frank Energy (GEOL) active ICPs with an overall under submission / underbilling of approximately 977 TJ per annum.

Recommendation	Audited party comment
To reduce the impact of not applying Joule-Thomson effect to the temperature factor calculations on overall industry UFG, investigate the effort to implement the Joule-Thomson effect into the temperature factor calculation for both billing and submission across all active ICPs.	Response: Genesis will review this recommendation Comments: Genesis are currently in the process of upgrading our billing platform and will look into the possibility of implementing the Joule-Thomson effect as part of this.

The formula in the MSD system for calculating the calorific value (CV) factor was reviewed and tested and found that the CV factor calculation only uses the OATIS calorific value recorded in MSD as at the 'meter read to' date rather than an average calorific value calculated across the likely read to read period. Section 2.13.3 of **NZS5259:2015** describes the calculation energy as '*The energy quantity of a calculated volume of gas at standard conditions shall be determined by multiplying the standard volume by the calorific value of the gas*'. Section 2.13.3 of **NZS5259:2015** also includes a note that states '*This should conform with the applicable guidelines published by the industry body approved under section 43ZL of the Gas Act*'.

The GIC published guideline for gas billing factors set the expectation regarding calorific value in section 6.5 of the guideline as '*The CV used in the energy calculation will be calculated from by the simple arithmetic average of the daily data between meter reading dates. No attempt should be made to correct for time lags between CV measurement and gas delivery*'.

The methodology used by MSD does not comply with the requirements of **NZS 5259:2015** and the GIC published guideline for gas billing factors. The method for calculating the CV factor used by Gentrack for deriving billing energy volumes was also checked and confirmed that Gentrack does correctly calculate a billing period average CV factor for used in the conversion of volume to energy.

An assessment was conducted comparing the business day reading dates CV factor to the likely read to read average CV factor using 62 days read to read period for allocation group 6 and 30 days for allocation group 4. This analysis identified the likely number of days where the CV factor is not likely to meet the maximum permissible errors (± 0.5%) set out in **NZS 5259:2015.** This analysis is summarised in the tables below.

### **GENESIS ENERGY**

		Count of days where m is outside read to read +/- 0.5%	neter 'read to' CV value I period average CV by	Max diff (%)		
Gas Type	Active ICP count	62 days read to read     30 days read to read     6       period (AG6) Ave CV     period (AG4) Ave CV     read		62 days read to read period (AG6)	30 days read to read period (AG4)	
В	6,867	48 (22.2% of meter read days)	45 (20.8% of meter read days)	1.25%	1.02%	
E	4,784	61 (28.2% of meter read days)	69 (31.9% of meter read days)	2.42%	2.92%	
F	1	83 (38.4% of meter read days)	76 (35.2% of meter read days)	13.76%	14.01%	
н	0	0	0	0	0	

I	0	0	0	0	0
J	0	0	0	0	0
к	0	0	0	0	0
М	281	57 (26.4% of meter read days)	49 (22.7% of meter read days)	4.54%	4.50%
N	579	61 (28.2% of meter read days)	69 (31.9% of meter read days)	2.42%	2.92%
0	3,666	56 (25.9% of meter read days)	64 (29.6% of meter read days)	2.79%	2.83%
Р	1,221	59 (27.3% of meter read days)	65 (30.1% of meter read days)	2.32%	2.82%
R	15,928	42 (19.4% of meter read days)	50 (23.1% of meter read days)	1.38%	1.14%
Т	36,434	57 (26.4% of meter read days)	63 (29.2% of meter read days)	2.78%	2.85%
U	246	61 (28.2% of meter read days)	69 (31.9% of meter read days)	2.42%	2.92%
х	25,785	49 (22.7% of meter read days)	50 (23.1% of meter read days)	1.38%	1.14%

### FRANK ENERGY

		Count of days where m is outside read to read +/- 0.5%	neter 'read to' CV value I period average CV by	Max diff (%)	
Gas Type	Active ICP count	62 days read to read period (AG6) Ave CV		62 days read to read period (AG6)	30 days read to read period (AG4)
В	1,131 48 (22.2% of meter read days) 45 (20.8% of meter read days)		1.25%	1.02%	
E	454 61 (28.2% of meter 69 (31.9 read days) read da		69 (31.9% of meter read days)	2.42%	2.92%
F	0	0 0		0	0
н	0	0 0 0		0	0
I	0	0 0 0		0	0
J	0	0	0	0	0

к	0	0	0	0	0
М	21	57 (26.4% of meter read days)	49 (22.7% of meter read days)	4.54%	4.50%
N	47	61 (28.2% of meter read days)	69 (31.9% of meter read days)	2.42%	2.92%
0	336	56 (25.9% of meter read days)	64 (29.6% of meter read days)	2.79%	2.83%
Р	159	59 (27.3% of meter read days)	65 (30.1% of meter read days)	2.32%	2.82%
R	1,394	42 (19.4% of meter read days)	50 (23.1% of meter read days)	1.38%	1.14%
т	4,339	57 (26.4% of meter read days)	63 (29.2% of meter read days)	2.78%	2.85%
U	21	61 (28.2% of meter read days)	69 (31.9% of meter read days)	2.42%	2.92%
х	5,584	49 (22.7% of meter read days)	50 (23.1% of meter read days)	1.38%	1.14%

The overall market impact is difficult to accurately assess without recalculating each ICPs read to read period volume to energy calculation.

The CV factor impact is likely to be minimal as each gas type CV values tend to differ by only +/- small percentages each day. While there might be some variance in the individual consumption period submission volumes, the overall gas year impact is likely to also be small.

The Temperature factor impact is likely to greater than the CV factor impact due to:

- The temperature changes between seasons combined with increased gas consumption occurring during the colder seasons.
- Bi monthly read cycles applied for Allocation Group 6 ICPs during the audit period. The read cycle impact has reduced during the audit period with the installation of 70,000 gas advanced meters (65% active ICPs) during the audit period.

As each factor impact was not able to be accurately assessed as part of this audit the non compliance impact has been assessed as minor.

Auditor comment						
Non-compliance	Description	١				
Report section: 4 Rule: 28.2 From: 27 November	Audit histo Controls: N Improveme Impact: Mi	ry: No leeds ent nor	No Genesis Energy (GENG) and Frank Energy (GEOL) apply temperature and calorific values as at the meter read to calculate the temperature and CV factors instead o average of the values across the read to read period a described in NZS 5259:2015 and also the GIC billing fa guideline.			
2015 To: 31 October 2023			d Frank Energy (GEOL) do not ct to the temperature factor e temperature factor for 144 ICPs m permissible errors (± 0.9%) set			
			<ul> <li>The volume to energy conversion for four Genesis Energy (GEND) TOU ICPs (0000322831QT39A, 0004226830NG91E, 1001294166NGCC4, 0008000080NG849) is incorrect as the register content (TG) did not match the meter owner's information (TA) resulting in altitude factor being applied twice.</li> <li>For ICP 1001294166NGCC4, the additional application of the altitude factor to volumes already adjusted for altitude within the corrector resulted in the altitude factor being outside the maximum permissible errors (±0.5%) set out in NZS 5259:2015. The impact of this error was assessed to be 0.74% or 38.38 TJ per annum.</li> </ul>			
			) TOU ICP 0004226830NG91E, the ported energy consumption and ted energy consumption was found 2 GJ) for March 2023. The cause meter pressure had not been a prior to the volume to energy on step (BAR to kPa) was also ruary (impact – 3.62 GJ) and April he conversion error exceeds the prs (±0.9%) as set out in <b>NZS</b>			
Remedial action rating		Remed	ial timeframe	Remedial comment		
In progress		Ongoin	g	See below		
Audited party comment						
The circumstances of the matters Ou outlined in the breach notice. System ICF notice of the matters of the matt		Our cui System ICP's be now res	rrent systems / processes do issue at the time of submiss eing impacted and not being solved and all affected ICP's	o not apply Joule-Thomson Effect. ion calculation resulted in some converted from BAR to kPa. Issue recalculated for revisions.		

Whether or not the participant admits or disputes that it is in breach.	Genesis accepts this breach
Estimate of the impact of the breaches (where admitted).	Minor
What steps or processes were in place to prevent the breaches?	Process in place to convert from BAR to kPa
What steps have been taken to prevent recurrence?	We are currently in the process of upgrading our billing platform and will look to implement the Joule-Thomson effect as part of this.
	New steps in our switching and meter change processes have been put in place to peer review that the correct register content is applied

# 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. Schedule 1 of the Downstream Regulations provides a matrix of correction criteria based on the type of metering issue.

Interim estimations are performed by the reconciliation team outside of the Oracle SQL database and are then uploaded and flagged as estimated energy values into the Oracle SQL database. These initial consumption estimations are derived from historic consumption patterns available in the oracle SQL database and are then adjusted to reflect known events that would impact an ICPs usual consumption patterns such as extreme weather events, pandemic or advised shut down periods. If the ICP is an allocation group 1 site, then the D+1 estimate produced by the Vector Data Services team on behalf of Genesis Energy may be used.

The spreadsheet used to calculate each TOU estimation is retained and is used as an electronic journal of all estimations performed, affected period, reference period and calculations applied.

Permanent estimations are also performed by the reconciliation team. Various methods are used depending on the nature of the issue.

If there is a data gap and register readings are available as part of the hourly / daily TOU data provided to Genesis Energy, then these corrected / uncorrected reads are used to determine the total volume consumed for the affected period. Where uncorrected reads have been used then a fixed factor calculation is applied using average altitude, pressure, temperature and compressibility factor values to produce a corrected volume. Genesis then applies a default CV value for the gas type applicable for the ICP to produce a total estimated energy volume. This total energy volume is then apportioned into daily energy values using an appropriate historic shape for the ICP. The use of a default CV value for these permanent estimations means that the estimated energy volumes may not reflect the actual Calorific values for each day of the period estimated.

A sample of seven permanent estimations where register readings were used to derive the determine the total volume consumed for the affected period were reviewed to confirm the methodology applied is consistent with the correction criteria described in Schedule 1 of Gas Downstream Regulations based on the type of metering error identified and also the accuracy of the estimation.

- All seven permanent estimations initially applied the correct methodology to determine the affected volume using either corrected or uncorrected register readings.
- For all seven ICPs a default CV value was applied to derive a total energy volume which was then apportioned using an appropriate historic seasonal shape for the ICP. The table below shows the accuracy of the default calorific value compared to the actual calorific values for each day of the affected estimated period.

ICP	Period estimated	Default CV applied	Average CV for estimated period	% difference default CV to Average CV	Number of days CV outside +/- 0.5%
0004227012NG563	1-23 Dec 2022	40	40.247	0.61%	16
0001632121QT3B5	1-31 Dec 2022	40	40.219	0.54%	18
0004226804NGFEC	1-23 Dec 2022	40	40.247	0.61%	16
0009000722NG968	1-20 Dec 2022	39.7	39.447	-0.64%	12
0008000055NG844	1-31 Dec 2022	39.4	39.507	0.27%	12
0000012821QT4AF	1-20 Dec 2022	39.4	39.447	0.12%	2
0001403959QTCA5	1-18 Dec 2022	39.4	39.422	0.06%	1

Where TOU data and register readings are not provided as part of the TOU data file received by Genesis Energy, then consumption history over the past 24 months, recent usage patterns and consultation with the customer are used to determine a likely profile and usage.

TOU data for ICP 1002057962QTE46 (gas gate TUK06502) for November 2021 was reviewed as the UFG for this month materially deviated from historical trends. Genesis had identified a meter fault where the logger was intermittently not recording the metered volumes. An estimate was performed using customer information of expected usage patterns rather than using corrected / uncorrected meter reads from the site investigation to resolve the meter fault. A review of the combined actual and estimated data for November 2021 identified four additional days that appeared to also require an estimation to be applied but was not resulting in an under submission of volume of approximately 5,000 GJ.

Five temporary estimates performed for the periods August 2021 were reviewed to determine the accuracy of the initial estimate. Three estimations were found to be greater than  $\pm$  10% and a review of GAS050 gas gate submission accuracy confirmed no aggregated gas gate volumes exceeded this accuracy threshold for these affected consumption periods.

Auditor comment					
Non-compliance	Descriptior	Description			
Report section: 5.1 Rule: Schedule 1 From: 1 December 2022 To: 31 December 2022	Audit histo Controls: N Improveme Impact: Mi	Dry: NoFor seven Genesis Energy (GENI estimation applied was not cons Gas Downstream Regulations as has been identified it is convert CV value prior to applying a sea daily submission volumes.Estimated TOU data for Genesis 1002057962QTE46 (gas gate TU was performed using customer usage patterns rather than usin meter reads resulting in an und identified as unexpected UFG for		(GEND) ICPs the permanent of consistent with Schedule 1 of the ons as once the affected volume inverted to energy using a default a seasonal shape to determine the enesis Energy (GEND) ICP ate TUK06502) for November 2021 omer information of expected in using corrected / uncorrected in under reporting of volume JFG for this month.	
Remedial action rating	dial action rating Reme		ial timeframe	Remedial comment	
In progress		June 2024		See below	
Audited party comment					
The circumstances of the outlined in the breach no	e matters otice.	Default CV values were being used			
Whether or not the parti admits or disputes that in breach.	cipant t is in	Genesis accepts this breach			
Estimate of the impact o breaches (where admitte	f the ed).	Minor			
What steps or processes were in n/a place to prevent the breaches?		n/a			
What steps have been taken to prevent recurrence?       Default Instead applied         Since 2 revisite reading		CV values will no longer be l, each period of estimation l. 022, each revision of estima ed and recalculated, if neces gs.	applied to all estimation periods. will have its own specific CV value ated GTOU data for that month is sary, based on new or subsequent		

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

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

### **GENESIS ENERGY and FRANK ENERGY**

### GAS040 non-TOU energy submissions

The GAS040 file for June 2022 was examined and compared to the data in Genesis Energy's system at ICP level; the ICP totals matched which confirms compliance. This also proves that Genesis's

consumption information provided to the Allocation agent is calculated at ICP level and then aggregated.

Genesis Energy validates non-TOU consumption at gas gate and ICP level prior to submission within MSD.

Inactive consumption monitoring was discussed in section 3.5:

The process for ensuring vacant consumption is included in the submission process was also reviewed. Genesis Energy and Frank Energy move in a dummy consumer ('The New Occupier') into Gentrack to ensure any meter reading obtained is uploaded into Gentrack and is validated. This meter reading then flows into MSD for submission purposes.

As mentioned in **section 2.1.1**, when there is a delay in updating the registry for new connections, the consumption information is not always included for the initial allocation. A sample of 21 ICPs were reviewed where the update to the registry was later than 30 business days and found that submission of consumption information to the allocation agent occurred at the next available revision (Interim or Final) for 19 ICPs listed below.

ІСР	Participant code	Event date	ACTC status event entry date	Date of first submission
1002160141QTEFE	GENG	10/05/2022	25/07/2023	Final (07/2022)
1000596533PG908	GENG	15/02/2022	28/02/2023	Final (02/2022)
1000606315PG8A4	GENG	3/05/2022	2/05/2023	Final (02/2022)
1002164116QTDBC	GENG	19/07/2022	3/07/2023	Final (07/2022)
1000608545PGE6A	GENG	16/09/2022	29/06/2023	Final (09/2022)
1000596338PG1DA	GENG	4/05/2022	23/06/2023	Final (05/2022)
1000609054PGC27	GENG	27/10/2022	26/07/2023	Final (10/2022)
1000607231PGC5F	GENG	10/08/2022	5/05/2023	Final (08/2022)
1000598516PG1D2	GENG	5/10/2022	26/06/2023	Final (10/2022)
1001303293NG557	GENG	31/05/2022	16/03/2023	Final (05/2022)
1000605127PG73E	GENG	5/04/2022	21/12/2022	Final (04/2022)
1000604135PGCB6	GENG	27/01/2022	7/10/2022	Final (01/2022)
1000607811PGB00	GENG	31/10/2022	11/07/2023	Final (10/2022)
1002166777QTB4F	GENG	9/09/2022	26/06/2023	Final (09/2022)
1000607231PGC5F	GENG	10/08/2022	10/08/2023	Final (08/2022)
1000598057PGA37	GENG	14/02/2022	18/10/2022	Final (10/2022)
1000598045PG01F	GENG	11/01/2022	12/09/2022	Final (01/2022)
1000609332PG15B	GENG	30/09/2022	28/04/2023	Final (09/2022)
1000605842PGC88	GENG	10/05/2022	29/06/2022	Interim (05/2022)
1000607047PG28A	GEOL	26/06/2022	9/01/2023	Final (06/2022)
1000605976PG37E	GEOL	4/05/2022	9/11/2022	Interim (05/2022)
1000606458PGA58	GEOL	2/06/2022	1/12/2022	Interim (06/2022)
1000603982PG7A3	GEOL	10/02/2022	11/08/2022	Interim (02/2022)
1000604408PG110	GEOL	1/10/2022	14/03/2023	Interim (10/2022)
1000607719PG61B	GEOL	5/07/2022	23/11/2022	Interim (07/2022)
1000597363PG6A6	GEOL	3/08/2022	1/12/2022	Interim (08/2022)
1000607378PG9AF	GEOL	8/07/2022	25/10/2022	Interim (07/2022)
1000604408PG110	GEOL	8/02/2022	23/05/2022	Interim (02/2022)

ІСР	Participant code	Event date	ACTC status event entry date	Date of first submission
1000607805PG0A7	GEOL	12/08/2022	9/11/2022	Interim (08/2022)
1000607620PG6B6	GEOL	1/08/2022	21/10/2022	Interim (08/2022)
1000605413PG4C9	GEOL	11/07/2022	22/09/2022	Interim (07/2022)
1000606338PGAAA	GEOL	8/06/2022	15/08/2022	Interim (06/2022)
1000605169PG600	GEOL	12/04/2022	15/06/2022	Interim (04/2022)
1000606221PG752	GEOL	9/05/2022	11/07/2022	Interim (05/2022)
1001303094NG29A	GEOL	6/05/2022	5/07/2022	Interim (05/2022)
1000606645PG5A9	GEOL	31/05/2022	18/07/2022	Interim (05/2022)
1000605087PG625	GEOL	6/04/2022	13/05/2022	Interim (04/2022)
1000606914PGEEB	GEOL	28/07/2022	1/09/2022	Interim (07/2022)

Additionally for two ICPs listed below, the internal processing time to complete both the status update and meter set up in Gentrack / MSD meant some consumption volume was recorded for periods outside the final revision submission window.

ICP	Participant code	Event date	ACTC status event entry date	Date of first submission
1000602472PG31C	GENG	26 May 2022	18 July 2023	Final (06/2022)
1000592715PG955	GENG	31 March 2022	22 February 2023	Final (06/2022)

As recorded in section 6 of the Switching and Registry Performance Audit, for six Genesis Energy and one Frank Energy new connection ICPs listed below the time taken to claim the ICP and update the status to active as resulted in some periods now being outside the revision window.

ICP Identifier	Retailer	Initial Retail / Status Event Date	Input Date	Days Overdue
1002107533QT11F	GEOL	07/09/2020	10/05/2023	664
1001299596NGAF2	GENG	21/08/2020	15/12/2022	579
1002105732QT41D	GENG	5/08/2020	1/09/2022	518
1001301873NG6A7	GENG	23/08/2021	17/05/2023	429
1001302284NG390	GENG	5/11/2021	21/07/2023	421
1002123848QT0D3	GENG	19/12/2020	8/08/2022	403
1001302183NGD59	GENG	12/10/2021	30/05/2023	402

Also recorded in section 9.1 of the Switching and Registry Performance Audit, the switches for three ICPs (ICPs 1000563170PG9D0 - 662 days, 0001424174QT30B - 556 days, 1000596140PGC94 - 438 days) related to wrong property switches. All three switches had event dates that were backdated more than 13 months resulting in some consumption volumes not able to be included in the submission process.

Auditor comment		
Non-compliance	Description	
Report section: 5.2 Rule: 26.2	Audit history: No Controls: Acceptable	There was a delay in updating the registry for 19 Genesis Energy (GENG) new connections and 19 Frank Energy new

From: 31 March 2022	Impact: Mi	nor	connections where the co provided until the interim	nsumption information not or final revision.	
To: 31 May 2022			There was a delay in updating the registry for two Genesis Energy (GENG) new connection ICPs (1000602472PG31C, 1000592715PG955) which were not resolved in time for the final GAS040 Submission for some consumption periods.		
			new connection ICPs, the update the status to active being outside the revision	time taken to claim the ICP and as resulted in some periods now window.	
			For three Frank Energy (GI – 662 days, 0001424174Q 1000596140PGC94 – 438 d backdated more than 13 n consumption volumes not submission process.	EOL) ICPs (ICPs 1000563170PG9D0 T30B - 556 days, days) the switch event dates were nonths resulting in some able to be included in the	
Remedial action rating		Remedial timeframe		Remedial comment	
In progress		Ongoing		See below	
Audited party comment					
The circumstances of the matters outlined in the breach notice.		Workload meaning the registry was not also updated in a timely manner. This is also contributed to by sometime receiving late paperwork from contractors			
Whether or not the participant General admits or disputes that it is in breach.		Genesi	Genesis accepts this breach		
Estimate of the impact of the Mir breaches (where admitted).		Minor	Minor		
What steps or processes were in place to prevent the breaches?Registr		y reporting			
What steps have been taken to     A       prevent recurrence?     un       hat     en		A recer under t have a enable	A recent restructure means the New Connections team now fall under the wider Retail Operations team This will enable us to now have a closer view of their turnaround times and report on this to enable timeliness of claiming ICP's.		

### **GENESIS ENERGY**

### GAS050 TOU energy submissions

GAS050 submissions are generated from the Oracle SQL database. A file format database is used to check the file is correctly formatted.

Genesis Energy validates TOU consumption prior to submission.

- Checks are performed to determine whether any ICPs are missing, or days are missing for the ICP,
- for initial submissions, the total monthly volume for the ICP is compared to the previous consumption patterns for consistency.

• for revisions, the GAS050 data is compared to the previous revision, and any differences are checked to confirm that they are as expected.

The submission checks performed compare the ICP monthly volumes against either monthly historical consumption patterns or prior submissions. Where an ICP is identified as being outside the expected consumption threshold a user will review the monthly consumption information and will either release the ICP or escalate it for further investigation.

As recorded in **section 5.1**, TOU data for ICP 1002057962QTE46 (gas gate TUK06502) for November 2021 was reviewed as the UFG for this month materially deviated from historical trends. Genesis had identified a meter fault where the logger was intermittently not recording the metered volumes. An estimate was performed using customer information of expected usage patterns rather than using corrected / uncorrected meter reads from the site investigation to resolve the meter fault. A review of the combined actual and estimated data for November 2021 identified four additional days that appeared to also require an estimation to be applied but was not resulting in an under submission of volume. Non conformance is recorded in **section 5.1**.

Genesis Energy does not actively monitor gas gate UFG where TOU data has been submitted therefore the data issues for ICP 1002057962QTE46 were not identified and resolved prior to the final revision submission.

Recommendation	Audited party comment
Include review of the daily TOU data whenever an ICP is identified in the submission checks as being outside the expected volume thresholds compared to historical consumption patterns or previous submissions.	<ul><li>Response: A process is already in place for this.</li><li>Comments: Genesis will review the current process and look for possible improvements.</li></ul>
Investigate implementing post submission UFG monitoring of TOU gas gates to ensure any potential TOU data corruption is identified and resolved in a timely manner.	<b>Response:</b> Genesis agrees with this recommendation <b>Comments:</b> Genesis will review this recommendation.

GAS050 files were checked for March 2023, including tracing data from the source read files though the Oracle SQL database conversion process into the GAS050 submissions. The GAS050 submissions were correctly generated for the sample of ICPs checked.

# 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.

### **GENESIS ENERGY**

Genesis Energy GAS040 submissions did not meet this requirement for some gas gates during the 36 month periods shown.

Month	Total Gas Gates	Number Within 10%	% Compliant	Within ±10% or > 10% but < 200 GJ	% Compliant or immaterial
Jul-19	80	34	43%	61	76%

The results are summarised in the table below.

Month	Total Gas Gates	Number Within 10%	% Compliant	Within ±10% or > 10% but < 200 GJ	% Compliant or immaterial
Aug-19	79	39	49%	67	85%
Sep-19	80	44	55%	71	89%
Oct-19	79	44	56%	72	91%
Nov-19	79	41	52%	71	90%
Dec-19	79	40	51%	74	94%
Jan-20	79	41	52%	72	91%
Feb-20	79	22	28%	69	87%
Mar-20	79	28	35%	67	85%
Apr-20	79	23	29%	61	77%
May-20	79	34	43%	64	81%
Jun-20	79	18	23%	54	68%
Jul-20	78	42	54%	70	90%
Aug-20	78	49	63%	72	92%
Sep-20	78	43	55%	71	91%
Oct-20	78	44	56%	70	90%
Nov-20	79	35	44%	71	90%
Dec-20	79	40	51%	74	94%
Jan-21	79	39	49%	74	94%
Feb-21	79	41	52%	71	90%
Mar-21	79	40	51%	71	90%
Apr-21	79	31	39%	65	82%
May-21	79	28	35%	58	73%
Jun-21	80	18	23%	58	73%
Jul-21	79	41	52%	69	87%
Aug-21	79	32	41%	64	81%
Sep-21	79	34	43%	68	86%
Oct-21	79	35	44%	69	87%
Nov-21	79	29	37%	68	86%
Dec-21	80	32	40%	71	89%
Jan-22	80	33	41%	70	88%
Feb-22	80	25	31%	65	81%
Mar-22	80	33	41%	68	85%
Apr-22	79	36	46%	68	86%
May-22	81	29	36%	65	80%
Jun-22	80	28	35%	62	78%

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
Jul-19	478,512.431	525,212.655	-9.76%
Aug-19	511,311.499	540,514.426	-5.71%
Sep-19	426,930.497	439,192.367	-2.87%
Oct-19	378,406.474	378,029.817	0.10%
Nov-19	260,022.089	263,279.358	-1.25%
Dec-19	219,689.843	213,877.785	2.65%
Jan-20	198,680.450	198,304.544	0.19%
Feb-20	165,980.561	185,046.387	-11.49%
Mar-20	221,304.347	226,027.336	-2.13%
Apr-20	258,499.543	230,161.564	10.96%
May-20	351,064.561	386,299.303	-10.04%
Jun-20	400,430.689	474,586.554	-18.52%
Jul-20	514,285.020	544,723.144	-5.92%
Aug-20	465,551.334	477,011.513	-2.46%
Sep-20	397,380.506	418,985.774	-5.44%
Oct-20	323,942.180	327,113.532	-0.98%
Nov-20	261,669.053	266,527.361	-1.86%
Dec-20	226,137.395	221,410.284	2.09%
Jan-21	181,908.961	184,767.433	-1.57%
Feb-21	166,657.660	176,411.974	-5.85%
Mar-21	203,261.131	216,647.353	-6.59%
Apr-21	234,740.929	256,232.963	-9.16%
May-21	335,287.780	392,325.984	-17.01%
Jun-21	373,075.723	445,980.860	-19.54%
Jul-21	494,837.476	516,162.923	-4.31%
Aug-21	466,691.042	467,060.183	-0.08%
Sep-21	386,514.025	393,311.950	-1.76%
Oct-21	302,744.041	300,236.201	0.83%
Nov-21	225,146.722	227,073.509	-0.86%
Dec-21	182,577.422	193,309.982	-5.88%
Jan-22	159,584.655	161,758.020	-1.36%
Feb-22	145,689.476	164,940.587	-13.21%
Mar-22	184,490.667	198,257.606	-7.46%

Month	Initial Submission All Gas Gates (GJ)	Final Submission All Gas Gates (GJ)	Percentage Variation
Apr-22	220,452.089	226,880.238	-2.92%
May-22	290,661.462	335,949.136	-15.58%
Jun-22	359,415.107	417,360.488	-16.12%

The tables above show that the consumption information submitted to the allocation agent for the initial submission was sometimes over estimated and at other times under estimated. This analysis indicates the impact that Covid-19 lockdowns had on estimation of non TOU load during these periods and also for subsequent periods where the estimation algorithms applied use previous periods as a basis of the estimation.

Genesis Energy monitors variances at gas gate and ICP level, and this reporting showed large variances were investigated and most differences were due to Covid-19 level 3 and 4 lockdown periods listed below.

- All New Zealand 25 March 2020 to 13 May 2020.
- Auckland 12 August 2020 to 30 August 2020.
- Auckland 28 February 2021 to 7 March 2021.
- All New Zealand 18 August 2021 to 7 September 2021.
- Auckland 7 September 2021 to 31 December 2021.

For three submission periods (Feb 2022 - 13.21%, May 2022 - 15.58% and Jun 2022 - 16.12%) post Covid-19 lockdowns the overall submission volumes have exceeded the ± 10% threshold.

Genesis Energy are actively installing gas AMI meters (70,000 installed – 65% of active ICPs) which will result in improved meter reading attainment going forward that will improve ongoing submission accuracy.

### FRANK ENERGY

Frank Energy GAS040 submissions did not meet this requirement for some gas gates during the 36 month periods shown.

Month	Total Gas Gates	Number Within 10%	% Compliant	Within ±10% or < 200 GJ	% Compliant or immaterial
Jul-19	65	24	37%	63	97%
Aug-19	65	30	46%	64	98%
Sep-19	65	30	46%	65	100%
Oct-19	64	27	42%	64	100%
Nov-19	64	23	36%	64	100%
Dec-19	64	28	44%	64	100%
Jan-20	64	29	45%	64	100%
Feb-20	64	16	25%	62	97%
Mar-20	64	14	22%	60	94%
Apr-20	63	15	24%	60	95%

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-20	63	22	35%	61	97%
Jun-20	64	21	33%	60	94%
Jul-20	63	27	43%	61	97%
Aug-20	63	33	52%	61	97%
Sep-20	63	34	54%	62	98%
Oct-20	63	29	46%	62	98%
Nov-20	63	23	37%	61	97%
Dec-20	63	27	43%	62	98%
Jan-21	63	27	43%	62	98%
Feb-21	63	23	37%	62	98%
Mar-21	64	20	31%	61	95%
Apr-21	64	23	36%	62	97%
May-21	63	14	22%	58	92%
Jun-21	64	14	22%	55	86%
Jul-21	64	33	52%	62	97%
Aug-21	64	29	45%	60	94%
Sep-21	64	27	42%	61	95%
Oct-21	64	22	34%	62	97%
Nov-21	64	26	41%	63	98%
Dec-21	65	23	35%	64	98%
Jan-22	65	28	43%	64	98%
Feb-22	65	12	18%	65	100%
Mar-22	65	18	28%	64	98%
Apr-22	65	20	31%	63	97%
May-22	65	20	31%	60	92%
Jun-22	65	18	28%	60	92%

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
Jul-19	30,276.356	33,330.655	-10.09%
Aug-19	32,989.275	34,430.664	-4.37%
Sep-19	27,278.609	27,709.492	-1.58%
Oct-19	24,528.445	24,265.669	1.07%

Month	Initial Submission All Final Submission All G Gas Gates (GJ) Gates (GJ)		Percentage Variation
Nov-19	16,932.387	17,033.300	-0.60%
Dec-19	14,031.628	14,013.949	0.13%
Jan-20	12,959.300	13,263.953	-2.35%
Feb-20	11,021.902	12,905.111	-17.09%
Mar-20	14,669.169	17,259.558	-17.66%
Apr-20	17,549.612	17,651.318	-0.58%
May-20	26,512.275	28,395.601	-7.10%
Jun-20	29,507.324	33,512.353	-13.57%
Jul-20	36,258.781	38,679.615	-6.68%
Aug-20	32,871.908	34,196.358	-4.03%
Sep-20	28,153.518	29,593.181	-5.11%
Oct-20	22,254.523	22,411.000	-0.70%
Nov-20	17,611.816	18,289.310	-3.85%
Dec-20	15,311.876	15,597.492	-1.87%
Jan-21	12,846.899	13,226.658	-2.96%
Feb-21	11,831.676	12,571.414	-6.25%
Mar-21	14,223.996	15,610.332	-9.75%
Apr-21	16,628.237	18,224.644	-9.60%
May-21	23,169.170	28,019.833	-20.94%
Jun-21	26,240.615	32,738.685	-24.76%
Jul-21	35,649.965	38,939.089	-9.23%
Aug-21	35,042.164	37,415.654	-6.77%
Sep-21	30,018.279	31,363.112	-4.48%
Oct-21	24,365.291	24,282.381	0.34%
Nov-21	18,134.242	17,923.802	1.16%
Dec-21	14,392.195	14,956.083	-3.92%
Jan-22	12,680.008	12,633.982	0.36%
Feb-22	11,100.822	12,393.450	-11.64%
Mar-22	14,081.575	14,918.848	-5.95%
Apr-22	16,661.496	17,250.220	-3.53%
May-22	22,694.244	25,790.528	-13.64%
Jun-22	28,379.810	32,883.316	-15.87%

The tables above show that the consumption information submitted to the allocation agent for the initial submission was sometimes over estimated and at other times under estimated. This analysis indicates the impact that Covid-19 lockdowns had on estimation of non TOU load during these periods

and also for subsequent periods where the estimation algorithms applied use previous periods as a basis of the estimation.

Frank Energy monitors variances at gas gate and ICP level, and this reporting showed large variances were investigated and most differences were due to Covid-19 level 3 and 4 lockdown periods listed below.

- All New Zealand 25 March 2020 to 13 May 2020.
- Auckland 12 August 2020 to 30 August 2020.
- Auckland 28 February 2021 to 7 March 2021.
- All New Zealand 18 August 2021 to 7 September 2021.
- Auckland 7 September 2021 to 31 December 2021.

For three submission periods (February 2022 – 11.64%%, May 2022 – 13.64% and June 2022 – 15.87%) post Covid-19 lockdowns the overall submission volumes have exceeded the ± 10% threshold.

Frank Energy are actively installing gas AMI meters which will result in improved meter reading attainment going forward that will improve ongoing submission accuracy.

Auditor comment					
Non-compliance	Descriptio	Description			
Report section: 5.3 Rule: 37.2 From: July 2019 final submission To: June 2022 final submission	Audit hist Controls: Effective Impact: N	Dry: YesGenesis Energy (GENG) did not meet the requirement for initial submissions to be within ±10% or < 200 GJ of the final submission for each gas gate on 415 occasions for submission periods between July 2019 and June 2022.linorFor three submission periods (Feb 2022 – 13.21%, May 2022 – 15.58% and Jun 2022 – 16.12%) the overall submission volumes have exceeded the ± 10% threshold.Frank Energy (GEOL) did not meet the requirement for initial submissions to be within ±10% or < 200 GJ of the final submission for each gas gate on 75 occasions for submission periods between July 2019 and June 2022.For four submission periods (February 2022 – 11.64%%, May 2022 – 13.64% and June 2022 – 15.87%) the overall submission volumes have exceeded the ± 10% threshold.		did not meet the requirement for within $\pm 10\%$ or < 200 GJ of the gas gate on 415 occasions for veen July 2019 and June 2022. riods (Feb 2022 – 13.21%, May 2022 – 16.12%) the overall e exceeded the $\pm$ 10% threshold. not meet the requirement for within $\pm 10\%$ or < 200 GJ of the gas gate on 75 occasions for veen July 2019 and June 2022. ods (February 2022 – 11.64%%, June 2022 – 15.87%) the overall e exceeded the $\pm$ 10% threshold.	
Remedial action rating		Remedial timeframe		Remedial comment	
In progress		Ongoing		Genesis will continue to work on improving our initial submission accuracy	
Audited party comment					
The circumstances of the n outlined in the breach noti	natters ce.	The period July 2019 and June 2022 was largely affected by Covid. This led to less read attainment and would have had a large impact on these discrepancies.			
Whether or not the participant admits or disputes that it is in breach.		Genesis accepts this breach			
Estimate of the impact of the breaches (where admitted).		Minor			
What steps or processes were in place to prevent the breaches?		Read attainment processes			
What steps have been taken to prevent recurrence?		Gas smart meters are being deployed and have been installed on over 65% of residential ICPs. Genesis will continue to deploy smart meters and continue to improve the manual read attainment performance			

## 5.4 Forward Estimates (Rules 34 & 36)

The rules do not prescribe how forward estimates are to be calculated. Genesis Energy uses a process that calculates forward estimates using the most recent two reads to derive a daily average consumption which is then applied to the number of days in the month not covered by the actual read

to read period. This approach is likely to result in higher forward estimates being calculated for spring months and lower forward estimates being calculated for autumn months.

Where a reading cannot be obtained within 12 months a permanent estimate is not applied that would ensure that once a reading is obtained, that there is no risk that some revised consumption volume will not be able to be included in the revision process as some periods may now fall outside the 13 month revision window.

### 5.5 Historic Estimates (Rules 34 & 35)

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

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

To assist with determining compliance of the historic estimate processes, Genesis Energy was supplied with a list of scenarios. For each scenario, a manual calculation was performed using the relevant seasonal adjustment shape file, and this was compared to the calculation performed in the MSD system. This test also proves that the correct shape file is used in each case.

Compliance is confirmed for the methodology applied for 10 of the 12 historic estimate scenarios. One scenario (L - ICP with meter pressure change part way through a month) produced non compliant results (Genesis Energy ICP 0000034731QTD00, Frank Energy ICP 0000103631QT524) where the change of meter pressure during the month was not reflected in the historic estimate calculation. A system fix was identified and implemented during the audit.

Test	Scenario	Test expectation	Result
а	ICP becomes Active part way through a month	Consumption is only calculated for the Active portion of the month.	Compliant
b	ICP becomes Inactive part way through a month.	Consumption is only calculated for the Active portion of the month.	Compliant
С	ICP's become Inactive then Active within a month.	Consumption is only calculated for the Active portion of the month.	Compliant
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.	Compliant
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.	Compliant
f	ICP switches out then back in within a month	Consumption is calculated for each day of responsibility.	Compliant
g	Continuous ICP with a read during the month	Consumption is calculated assuming the readings are valid until the end of the day	Compliant
h	Continuous ICP without a read during the month	Consumption is calculated assuming the readings are valid until the end of the day	Compliant
i	Rollover Reads	Consumption is calculated correctly in the instance of meter rollovers.	Compliant
j	ICP has a multiplier or fixed factor (if any)	Consumption is calculated including the multiplier or fixed factor.	No examples available

One scenario had no examples identified to review during the audit period.

Test	Scenario	Test expectation	Result
k	ICP with meter change part way through a month	No gaps or overlaps in HE records across meter change	Correct
I	ICP with meter pressure change part way through a month	Pressure change is applied correctly across the respective time slices.	Non Compliant

#### **GENESIS ENERGY**

The historic estimate process calculates the read to read measured volume in cubic meters. This volume is then converted to standard cubic meters with the application of altitude factor, temperature factor, pressure factor and compressibility factor before finally applying the calorific value factor to convert this standard volume into an energy value. The energy volume is then normalised using seasonal adjustment daily shape values (SADSV) applicable for the respective gas gate the ICP is supplied from.

As recorded in section 4, MSD uses a single temperature value and calorific value as of the meter read to date to calculate the temperature factor and CV factor.

The altitude and pressure factors are expected to be static for non-TOU ICPs, and the compressibility factor, temperature factor, and calorific value are expected to change. I reviewed the potential impact of these MSD methodologies on conversion.

- The annual temperature variance for the year ending 31 July 2023 at each gas gate is 9.8-12.7 degrees. Excluding the Joule Thomson effect, based on these temperature variances the temperature factors could vary by up to 4.51% across a year. As most ICPs are read regularly is expected that temperature differences across read to read periods are likely to be small, as most read periods are likely to cover one or two months. Non conformance is recorded in **section 4** as the process to calculate the average temperature for the read to read period does not conform to **NZS5259:2015**.
- As recorded in **section 2.4.1**, Joule-Thomson effect is not applied by Genesis Energy in the calculation of the temperature factor. There are 95,792 active ICPs and the average impact of the non application of the Joule-Thomson effect in calculating the temperature factor across this population is 0.47% (11.8 TJ per annum).
- The annual CV variance for each gas type for the year ending 31 July 2023 is 0.911-4.489. The CV values applied could vary by up to 16.6% across a year. While the annualised impact is likely to be small, the individual impact at ICP level to individual billing periods, given the seasonal nature of gas consumption could exceed the maximum permissible errors (± 0.5%) set out in NZS5259:2015. Non conformance is recorded in section 4 as the methodology applied by MSD to calculate the CV factor does not comply with NZS 5259:2015.
- As recorded in section 4, MSD does not use any of the methodologies listed in NZS 5259:2015 section 3.8.2.4 (AGA 8, AGA NX19 or ISO 12213) to calculate compressibility. Compressibility factors vary significantly based on meter pressure, however 99.9% of Genesis Energy's active non-TOU ICPs have meter pressures below 50 kPa resulting in compressibility factors which are very close to 1. While MSD applies a compressibility factor calculation not listed in NAS 5259:2105, testing performed to validate the energy consumption calculation for non TOU compressibility factor did not identify any occurrences where the calculated value was outside the maximum permissible errors set out in NZS 5259:2015.

#### FRANK ENERGY

Frank Energy applies the same historic estimate process described above for Genesis Energy.

The altitude and pressure factors are expected to be static for non-TOU ICPs, and the compressibility factor, temperature factor, and calorific value are expected to change. I reviewed the potential impact of these changes on conversion.

As recorded in **section 4**, MSD uses a single temperature value and calorific value as of the meter read to date to calculate the temperature factor and CV factor.

The altitude and pressure factors are expected to be static for non-TOU ICPs, and the compressibility factor, temperature factor, and calorific value are expected to change. I reviewed the potential impact of these MSD methodologies on conversion.

- The annual temperature variance for the year ending 31 July 2023 at each gas gate is 9.8-12.7 degrees. Excluding the Joule Thomson effect, based on these temperature variances the temperature factors could vary by up to 4.51% across a year. As most ICPs are read regularly is expected that temperature differences across read to read periods are likely to be small, as most read periods are likely to cover one or two months. Non conformance is recorded in **section 4** as the process to calculate the average temperature for the read to read period does not conform to **NZS 5259:2015**.
- As recorded in **section 2.4.1**, Joule-Thomson effect is not applied by Genesis Energy in the calculation of the temperature factor. There are 13,486 active ICPs and the average impact of the non application of the Joule-Thomson effect in calculating the temperature factor across this population is 0.52% (977 GJ per annum).
- The annual CV variance for each gas type for the year ending 31 July 2023 is 0.911-4.489. The CV values applied could vary by up to 16.6% across a year. While the annualised impact is likely to be small, the individual impact at ICP level to individual billing periods, given the seasonal nature of gas consumption could exceed the maximum permissible errors (± 0.5%) set out in NZS 5259:2015. Non conformance is recorded in section 4 as the methodology applied by MSD to calculate the CV factor does not comply with NZS 5259:2015.
- As recorded in section 4, MSD does not use any of the methodologies listed in NZS 5259:2015 section 3.8.2.4 (AGA 8, AGA NX19 or ISO 12213) to calculate compressibility. Compressibility factors vary significantly based on meter pressure, however 99.9% of Genesis Energy's active non-TOU ICPs have meter pressures below 50 kPa resulting in compressibility factors which are very close to 1. While MSD applies a compressibility factor calculation not listed in NZS 5259:2105, testing performed to validate the energy consumption calculation for non TOU compressibility factor did not identify any occurrences where the calculated value was outside the maximum permissible errors set out in NZS 5259:2015.

Auditor comment				
Non-compliance	Description			
Report section: 5.5 Rule: 28.2 From: 14 July 2022 To: 1 August 2022	Audit history: No Controls: Acceptable Impact: Minor	The pressure factor relating to a meter pressure change for an existing meter (Genesis Energy (GENG) ICP 0000103631QT524, Frank Energy (GEOL) ICP 0000034731QTD00) was incorrectly calculated (scenario L) as the change in meter pressure during the month was not reflected in the historic estimate calculation.		

Remedial action rating	Remedial timeframe Remedial comment		
Completed	Resolved	The system has now been changed and processes are in place to ensure this noncompliance does not happen going forward	
Audited party comment			
The circumstances of the matters outlined in the breach notice.	Processes were not in place to ensure compliance		
Whether or not the participant admits or disputes that it is in breach.	We accept this breach		
Estimate of the impact of the breaches (where admitted).	Minor		
What steps or processes were in place to prevent the breaches?	n/a		
What steps have been taken to prevent recurrence?	The system has now been changed and processes are in place to ensure this noncompliance does not happen going forward		

# 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)

### **GENESIS ENERGY non TOU (GENG)**

GAS070 reports are generated using invoice information calculated by Gentrack. 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 some gas gates and checking the invoice data for all ICPs connected to the gas gate against the GAS070 file for March 2023. This confirmed the accuracy of the data, and all the invoices included had invoice dates within March 2023.

The chart below shows a comparison between rolling annual quantities billed and rolling annual consumption information submitted to the allocation agent for a 28-month period from the GAR080 (Report billed versus consumption comparison) report. 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.

The differences between billed and submission data were reviewed and found they were attributed to timing, with differences reducing as submission volumes were washed up. No issues were identified.



### Comparison between Rolling Annual Submitted Volumes and Gas Supplied

Year ending	Annual Billed GJ	Annual Consumption GJ	GJ difference	Percentage Difference
Jan-20	4,199,149	4,165,851	33,299	0.80%
Feb-20	4,208,846	4,151,595	57,251	1.38%
Mar-20	4,195,689	4,157,239	38,450	0.92%
Apr-20	4,119,554	4,139,016	-19,462	-0.47%
May-20	4,063,690	4,104,372	-40,682	-0.99%
Jun-20	4,044,687	3,962,765	81,922	2.07%
Jul-20	4,073,453	3,987,462	85,991	2.16%
Aug-20	4,010,506	3,986,413	24,093	0.60%
Sep-20	3,950,759	3,970,336	-19,577	-0.49%
Oct-20	3,950,487	3,930,078	20,409	0.52%
Nov-20	3,942,768	3,947,193	-4,425	-0.11%

Year ending	Annual Billed GJ	Annual Consumption GJ	GJ difference	Percentage Difference
Dec-20	3,932,404	3,965,468	-33,064	-0.83%
Jan-21	3,901,098	3,954,370	-53,272	-1.35%
Feb-21	3,917,600	3,929,746	-12,145	-0.31%
Mar-21	3,911,598	3,910,653	945	0.02%
Apr-21	3,922,995	3,925,518	-2,524	-0.06%
May-21	3,951,839	3,886,096	65,742	1.69%
Jun-21	3,916,234	3,805,818	110,416	2.90%
Jul-21	3,883,636	3,813,577	70,059	1.84%
Aug-21	3,843,165	3,874,944	-31,779	-0.82%
Sep-21	3,814,840	3,864,024	-49,184	-1.27%
Oct-21	3,828,543	3,835,340	-6,797	-0.18%
Nov-21	3,792,149	3,798,413	-6,264	-0.16%
Dec-21	3,766,658	3,754,880	11,778	0.31%
Jan-22	3,781,389	3,730,939	50,450	1.35%
Feb-22	3,736,879	3,710,821	26,058	0.70%
Mar-22	3,720,433	3,681,072	39,361	1.07%
Apr-22	3,717,730	3,664,810	52,920	1.44%

### **GENESIS ENERGY TOU (GEND)**

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

The chart below shows a comparison between rolling annual quantities billed and rolling annual consumption information submitted to the allocation agent for a 27-month period from the GAR080 (Report billed versus consumption comparison) report. 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.

The previous audit identified an issue for the period November 2019 to January 2020 where the billed volumes for one ICP was reported in kWh rather than GJ in error. This issue has been resolved and no occurrences of billed volumes reported in kWh have occurred during this audit period.

The differences between billed and submission data were reviewed and found they were attributed to timing, with differences reducing as submission volumes were washed up. No issues were identified.


#### Comparison between Rolling Annual Submitted Volumes and Gas Supplied

Year ending	Annual Billed GJ	Annual Consumption GJ	GJ difference	Percentage Difference	
Feb-20	5,150,409	5,143,697	6,712	0.13%	
Mar-20	5,106,574	5,089,365	17,210	0.34%	
Apr-20	5,011,188	4,992,425	18,763	0.38%	
May-20	4,930,088	4,886,296	43,792	0.90%	
Jun-20	4,923,720	4,865,850	57,869	1.19%	
Jul-20	4,956,711	4,907,906	48,806	0.99%	
Aug-20	4,907,365	4,877,796	29,569	0.61%	
Sep-20	4,942,666	4,876,449	66,217	1.36%	
Oct-20	4,908,317	4,904,355	3,962	0.08%	
Nov-20	4,896,648	4,946,665	-50,017	-1.01%	

Year ending	Annual Billed GJ	Annual Consumption GJ	GJ difference	Percentage Difference
Dec-20	4,948,308	4,980,717	-32,409	-0.65%
Jan-21	4,922,118	4,976,986	-54,868	-1.10%
Feb-21	4,949,810	4,990,884	-41,074	-0.82%
Mar-21	5,003,979	5,050,509	-46,529	-0.92%
Apr-21	5,102,452	5,153,099	-50,648	-0.98%
May-21	5,139,486	5,179,938	-40,452	-0.78%
Jun-21	5,149,663	5,176,909	-27,246	-0.53%
Jul-21	5,185,475	5,166,266	19,208	0.37%
Aug-21	5,166,672	5,152,882	13,790	0.27%
Sep-21	5,107,451	5,127,911	-20,460	-0.40%
Oct-21	5,093,546	5,054,732	38,814	0.77%
Nov-21	5,077,417	5,009,180	68,237	1.36%
Dec-21	4,908,059	5,006,807	-98,748	-1.97%
Jan-22	4,789,610	4,836,955	-47,345	-0.98%
Feb-22	4,640,745	4,690,313	-49,568	-1.06%
Mar-22	4,488,296	4,512,126	-23,830	-0.53%
Apr-22	4,322,854	4,360,987	-38,133	-0.87%

#### FRANK ENERGY

GAS070 reports are generated using invoice information calculated by Gentrack. 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 some gas gates and checking the invoice data for all ICPs connected to the gas gate against the GAS070 file for March 2023. This confirmed the accuracy of the data, and all the invoices included had invoice dates within March 2023.

The chart below shows a comparison between rolling annual quantities billed and rolling annual consumption information submitted to the allocation agent for a 28-month period from the GAR080 (Report billed versus consumption comparison) report. 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.

The differences between billed and submission data were reviewed and found that the rolling annual billed volumes are consistently higher than the submitted consumption volumes and this difference cannot be attributed to timing differences between the consumption period and when the invoice is produced.

Recommendation	Audited party comment
Investigate the cause of why the annual billed volumes reported are consistently higher than the annual consumption volumes reported for GEOL	<b>Response:</b> Genesis agrees with this recommendation
	comments: Genesis will review the reason for the discrepancies between billed / submitted volumes. We continue with our deployment of Gas smart meters and expect this to improve our initial submission accuracy.

#### Sum of ActualSales Sum of Consumption GEOL Billed vs Submitted 295000 290000 285000 280000 275000 270000 265000 260000 255000 0ct-20 Sep. 20 404.20 Feb-20 AUB20 40022 Mar-21 APT-21 May21 Decilo Jun-21 101-22 AUB21 02:22 M04-22 Jan-22 Jan-20 Jan-21 Sep.21 Decili Maril April May Jun 2 Juli A Leb 22 Nat 2 Apr 22 Values Sum of ActualSales Sum of Consumption LastMonthBilled 🖵

#### Comparison between Rolling Annual Submitted Volumes and Gas Supplied

Year ending	Annual Billed GJ	Annual Consumption GJ	GJ difference	Percentage Difference
Jan-20	274,435	267,376	7,059	2.64%
Feb-20	277,719	267,600	10,119	3.78%
Mar-20	278,445	269,503	8,941	3.32%
Apr-20	278,640	270,300	8,340	3.09%

Year ending	Annual Billed GJ	Annual Consumption GJ	GJ difference	Percentage Difference
May-20	284,384	274,888	9,496	3.45%
Jun-20	285,928	271,080	14,848	5.48%
Jul-20	282,344	274,430	7,914	2.88%
Aug-20	283,190	276,246	6,944	2.51%
Sep-20	280,644	278,691	1,953	0.70%
Oct-20	280,175	277,996	2,179	0.78%
Nov-20	280,072	279,427	645	0.23%
Dec-20	280,669	281,051	-382	-0.14%
Jan-21	281,035	281,153	-118	-0.04%
Feb-21	282,023	280,290	1,733	0.62%
Mar-21	282,394	277,619	4,775	1.72%
Apr-21	279,604	277,246	2,359	0.85%
May-21	278,540	273,146	5,394	1.97%
Jun-21	277,422	267,453	9,969	3.73%
Jul-21	277,102	269,357	7,744	2.88%
Aug-21	275,759	276,446	-687	-0.25%
Sep-21	282,682	279,984	2,698	0.96%
Oct-21	288,183	283,702	4,481	1.58%
Nov-21	289,494	284,789	4,705	1.65%
Dec-21	288,977	283,458	5,519	1.95%
Jan-22	289,004	282,917	6,087	2.15%
Feb-22	288,077	282,327	5,750	2.04%
Mar-22	287,833	280,966	6,866	2.44%
Apr-22	289,846	280,908	8,939	3.18%

### 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. Genesis Energy confirmed that processes exist to monitor the need for a supplementary agreement and inform the reconciliation team where there are changes to supplementary agreements for allocated gas gates.

There are currently no supplementary agreements in place for any allocated gas gates.

### 6. Recommendations

16 recommendations were made during this audit, as follows:

- Implement process to regularly compare meter equipment owner records of the corrector function to The Oracle SQL database register content code for the ICP to ensure alignment and correct application of gas factors.
- Review the selection criteria of the allocation group exception report to ensure all ICP exceptions ae identified for review.
- Review read attainment process for allocation group 4 ICPs to ensure any meter read attainment issues are escalated and resolved as soon as possible.
- Review outstanding allocation group 4 forward estimate volumes for interim revisions as a measure of the reading performance for allocation group 4 ICPs and ensure the read issues impacting these ICPs are resolved prior to final revisions.
- Review the selection criteria of the No Read ICP List exception report to ensure all active ICPs (ACTC and ACTV registry status) with no reads for 12 months are included and the registry allocation group and status is also reported to allow users to prioritise next steps.
- Ensure all reported gas meter condition codes are investigated in a timely manner to support the read attainment processes.
- Review the format of the spreadsheet template 'Gas New Calculations spreadsheet' to ensure users are not able to incorrectly apply an incorrect number of affected days for the stopped meter volume calculation.
- Investigate implementing a peer review process to the stopped meter volume correction process to ensure the calculation steps and data inputs are correct in every case.
- Investigate amending the inactive consuming report to include all inactive periods where Frank Energy is recorded as the retailer and where inactive consumption is detected for each of these ICP tenue periods.
- Work with the TOU data collectors to implement a notification process for time corrections greater than ± 300 seconds enable Genesis Energy to review the TOU data and determine if a data correction is also required.
- Review all Gas TOU ICPs, for all available revision consumption periods, that require meter pressure conversions from BAR to kPa to ensure all upload data in the Oracle SL database has the correct meter pressures used for submission and also billing.
- Investigate implementing a monthly check for all ICPs that require the manual processing to the SQL script to convert meter pressure from BAR to kPa to ensure gas TOU energy volumes will be correctly calculated for billing and submission purposes.
- To reduce the impact of not applying Joule-Thomson effect to the temperature factor calculations on industry UFG investigate the effort to implement the Joule-Thomson effect into the temperature factor calculation for both billing and submission across all active ICPs.

- Include review of the daily TOU data whenever an ICP is identified in the submission checks as being outside the expected volume thresholds compared to historical consumption patterns or previous submissions.
- Investigate implementing post submission UFG monitoring of TOU gas gates to ensure any potential TOU data corruption is identified and resolved in a timely manner.
- Investigate the cause of why the annual billed volumes reported are consistently higher than the annual consumption volumes reported for GEOL.

# Appendix 1 - Alleged Breach Detail

ICPs where the registry was not populated within two business days of Genesis Energy entering into an agreement to supply gas to a consumer (**section 2.1.1**).

### **GENESIS ENERGY**

ICP Identifier	Initial Retail / Status Event Date	Input Date	Days Overdue
1001299596NGAF2	21/08/2020	15/12/2022	579
1002105732QT41D	5/08/2020	1/09/2022	518
1001301873NG6A7	23/08/2021	17/05/2023	429
1001302284NG390	5/11/2021	21/07/2023	421
1002123848QT0D3	19/12/2020	8/08/2022	403
1001302183NGD59	12/10/2021	30/05/2023	402
1002156893QTEDC	16/12/2021	28/07/2023	397
1001302491NG274	7/12/2021	1/05/2023	342
1001302693NG8F6	14/02/2022	5/05/2023	302
1002159713QTDF9	5/05/2022	10/07/2023	292
1001302514NG375	9/12/2021	9/02/2023	286
1001302513NGEBF	9/12/2021	9/02/2023	286
1002146169QTDB2	10/08/2021	27/09/2022	281
1001302484NG596	7/12/2021	18/01/2023	273
1001302482NG419	7/12/2021	18/01/2023	273
1001302480NG49C	7/12/2021	18/01/2023	273
1001302483NG85C	7/12/2021	18/01/2023	273
1001303308NGD60	3/06/2022	12/07/2023	273
1001301931NGD83	7/09/2021	30/09/2022	264
1002160408QT70F	12/05/2022	24/05/2023	255
1001302199NG565	15/10/2021	13/10/2022	245
1001302218NGF69	19/10/2021	7/10/2022	239
1001302216NGCF2	19/10/2021	7/10/2022	239
1001302219NG32C	19/10/2021	7/10/2022	239
1001302220NGA85	19/10/2021	7/10/2022	239
1001302217NG0B7	19/10/2021	7/10/2022	239
1001301746NG31F	5/08/2021	22/07/2022	238
1001301743NGE50	5/08/2021	22/07/2022	238
1001301744NG39A	5/08/2021	22/07/2022	238
1001301745NGFDF	5/08/2021	22/07/2022	238
1001302722NGF05	16/02/2022	24/01/2023	231
1001302720NGF80	16/02/2022	24/01/2023	231

ICP Identifier	Initial Retail / Status Event Date	Input Date	Days Overdue
1001302723NG340	16/02/2022	24/01/2023	231
1001302724NGE8A	16/02/2022	24/01/2023	231
1001302721NG3C5	16/02/2022	24/01/2023	231
1001302181NGDDC	12/10/2021	31/08/2022	218
1001302266NG9AF	3/11/2021	19/09/2022	216
1001302095NGF7F	22/09/2021	8/08/2022	215
1000593937PG32E	1/11/2021	13/09/2022	214
1000593936PGF6B	1/11/2021	13/09/2022	214
1000593942PGB3C	1/11/2021	13/09/2022	214
1001302290NG837	9/11/2021	19/09/2022	212
1001302192NGBB1	14/10/2021	22/08/2022	209
1001302907NG914	17/03/2022	13/01/2023	203

#### FRANK ENERGY

ICP Identifier	Initial Retail Event Date	Input Date	Days Overdue
1002107533QT11F	07-Sep-20	10-May-23	664
1002144745QT6BF	14-Jul-21	03-Oct-22	304
1002159920QT0CA	09-May-22	10-Oct-22	105
1001303360NG084	14-Jun-22	12-Oct-22	82
1000597363PG6A6	03-Aug-22	09-Nov-22	66
1002165784QT578	22-Aug-22	16-Nov-22	58
1002165782QT4F7	22-Aug-22	16-Nov-22	58
1000607620PG6B6	01-Aug-22	19-Oct-22	54
1002165783QT8B2	22-Aug-22	10-Nov-22	54
1000607378PG9AF	08-Jul-22	22-Sep-22	52
1000607805PG0A7	12-Aug-22	27-Oct-22	50
1000607047PG28A	26-Jun-22	18-Aug-22	36
1000607049PG111	16-Sep-22	09-Nov-22	34
1000607719PG61B	04-Jul-22	28-Jul-22	16
1000605294PGA4F	27-Sep-22	20-Oct-22	15
1000606914PGEEB	06-Jul-22	28-Jul-22	14
1000605413PG4C9	11-Jul-22	28-Jul-22	11

ICPs outside Temperature factor maximum permissible errors ( $\pm$  0.9%) due to the non application of Joule-Thomson Effect (**section 2.3.1**).

#### **GENESIS ENERGY**

ICP	MSD /		_	_	% difference	volume impact (GI
	Gentrack	Registry	temp factor	temp factor	FT (±	inpact (0)
	Network	Network	(Inc JT) MSD /	(INC JI)	0.9%)	
	Pressure	Pressure	Gentrack	Registry		
0000187231QT080	1000	275	0.99617	1.00881	-1.3%	121.348
0000488851QT1C9	1900	70	0.99588	1.02840	-3.2%	111.776
0008000110NGEAA	1900	350	1.00296	1.03076	-2.7%	86.189
0004226790NGE0E	950	35	1.00418	1.02045	-1.6%	81.548
0001396888QT149	700	70	0.99614	1.00711	-1.1%	60.004
0002037561QT09D	950	70	1.00090	1.01643	-1.5%	56.775
1001279280QT569	1000	35	0.99611	1.01301	-1.7%	34.228
1000527737PGDAC	950	35	1.00183	1.01802	-1.6%	32.008
0000174781QT04B	700	35	0.99614	1.00772	-1.1%	30.288
1001264536NGD51	1000	35	0.99259	1.00937	-1.7%	24.905
0000577781QTB14	1000	2.5	0.99611	1.01359	-1.7%	20.335
0000187291QT89F	1000	7	0.99617	1.01357	-1.7%	15.277
0001539691QTD51	560	3	1.00217	1.01198	-1.0%	13.985
0000504731QT1FF	1000	35	0.99617	1.01307	-1.7%	13.325
0004226814NG541	950	35	1.00418	1.02045	-1.6%	12.974
1000512888PG9C3	950	101	1.00418	1.01926	-1.5%	12.486
0000343451QT39E	1000	7	0.99611	1.01351	-1.7%	11.743
0000589231QT1FF	1000	35	0.99611	1.01301	-1.7%	9.199
0000027266GNB78	1050	7	0.99902	1.01741	-1.8%	9.186
0000782161QTDCC	1000	7	0.99611	1.01351	-1.7%	7.660
0000014791GN06C	1050	7	0.99902	1.01741	-1.8%	7.280
0001429118QT5C5	700	35	0.99614	1.00772	-1.1%	6.093
0004224830NGA5E	950	35	1.00206	1.01826	-1.6%	5.991
0004227743NGE2C	950	3	1.00418	1.02103	-1.7%	5.550
0000188201QTE18	700	7	0.99614	1.00822	-1.2%	5.181
0001443401QT824	1000	3	0.99617	1.01364	-1.7%	5.153
1002043230QTBA4	1000	35	0.99611	1.01301	-1.7%	4.904
0001447609QT6B7	1000	35	0.99617	1.01307	-1.7%	4.586
0001419351QT21A	1000	35	0.99617	1.01307	-1.7%	4.469
0000347321QTF41	1000	7	0.99617	1.01357	-1.7%	4.111
0004221720NG8DC	950	7	1.00418	1.02096	-1.6%	3.824
0002322961QTFE4	1000	7	0.99617	1.01357	-1.7%	3.764
0004219297NGE8D	950	3	1.00418	1.02103	-1.7%	3.491
0001835201QT395	560	3	1.00119	1.01097	-1.0%	3.229

ICP	MSD /				%	volume
	Gentrack	Registry	temp factor	temp factor	difference	impact (GJ
	Network	Network	(Inc JT) MSD /	(Inc JT)	0.9%)	
	Pressure	Pressure	Gentrack	Registry		
0002326961QT964	560	7	1.00183	1.01155	-1.0%	3.112
0004227551NGE03	950	7	1.00418	1.02096	-1.6%	3.023
1000540454PGBA7	950	7	1.00206	1.01876	-1.6%	2.848
1001138792QTCC5	1000	7	0.99617	1.01357	-1.7%	2.767
1001259823QT271	1000	7	0.99611	1.01351	-1.7%	2.604
0000089641QT570	700	3	0.99614	1.00829	-1.2%	2.533
1001118651QT723	700	7	0.99614	1.00822	-1.2%	2.484
0004224654NG2AF	950	3	1.00206	1.01883	-1.6%	2.201
0004226417NG58D	950	2.75	1.00206	1.01884	-1.6%	2.125
1001151518QTFE1	1000	7	0.99617	1.01357	-1.7%	2.064
0000237565QT43D	1000	2.5	0.99617	1.01365	-1.7%	2.014
1001246545QT887	700	7	0.99614	1.00822	-1.2%	1.971
1001099747QTFEC	1000	7	0.99611	1.01351	-1.7%	1.682
0000758311QT087	1000	140	0.99617	1.01120	-1.5%	1.577
0004217394NG389	950	3	1.00418	1.02103	-1.7%	1.445
0000590441QT6E5	1000	3	0.99617	1.01364	-1.7%	1.203
0000920391QT862	1000	35	0.99617	1.01307	-1.7%	1.176
1000523191PG4BA	950	3	1.00418	1.02103	-1.7%	1.095
1000506598PG807	950	3	1.00206	1.01883	-1.6%	0.981
1000519396PGC1B	950	35	1.00206	1.01826	-1.6%	0.967
1001267438QT3E8	1000	2.75	0.99669	1.01418	-1.7%	0.711
0004219386NG161	950	1.5	1.00418	1.02106	-1.7%	0.709
1000574809PG754	950	2.5	1.00090	1.01764	-1.6%	0.614
1000541310PG6AA	950	2.5	1.00206	1.01884	-1.6%	0.592
0000793721QT02E	700	3	0.99614	1.00829	-1.2%	0.564
0004224645NG447	950	3	1.00206	1.01883	-1.6%	0.562
0004220746NG703	950	3	1.00418	1.02103	-1.7%	0.560
0004219389NGEBF	950	2.5	1.00418	1.02104	-1.7%	0.542
1002110228QT6E5	700	7	0.99611	1.00819	-1.2%	0.522
0004000709NGB6D	950	3	1.00418	1.02103	-1.7%	0.488
0004004597NGB96	950	3	1.00418	1.02103	-1.7%	0.480
1000523556PG29E	950	2.5	1.00418	1.02104	-1.7%	0.462
1001150088QT4A3	700	7	0.99614	1.00822	-1.2%	0.459
0001733151QT324	950	2	1.00191	1.01870	-1.6%	0.458
0004202141NG642	950	3	1.00418	1.02103	-1.7%	0.439

ICP	MSD /				%	volume
	Gentrack	Registry	temp factor	temp factor	difference FT (±	Impact (GJ
	Network	Network	(Inc JT) MSD /	(Inc JT)	0.9%)	
	Pressure	Pressure	Gentrack	Registry		
0000338891QTD24	700	2.5	0.99614	1.00830	-1.2%	0.438
0002322871QTC4D	950	2.5	1.00139	1.01815	-1.6%	0.407
1001151955QTE13	700	35	0.99614	1.00772	-1.1%	0.399
0004220852NG3AB	950	1.5	1.00418	1.02106	-1.7%	0.395
1001268231QT2DF	700	3	0.99611	1.00826	-1.2%	0.373
0001733131QTCD4	950	2.5	1.00191	1.01869	-1.6%	0.340
0004220836NGD51	950	1.5	1.00418	1.02106	-1.7%	0.335
0004219542NG182	950	1.5	1.00418	1.02106	-1.7%	0.329
0004219206NGD2F	950	1.5	1.00418	1.02106	-1.7%	0.325
0004217251NG02D	950	1.5	1.00418	1.02106	-1.7%	0.325
0004202714NG503	950	1.5	1.00418	1.02106	-1.7%	0.306
1000523173PGE85	950	3	1.00418	1.02103	-1.7%	0.302
0004203268NG7E5	950	1.5	1.00418	1.02106	-1.7%	0.287
0004209566NG53C	950	3	1.00418	1.02103	-1.7%	0.280
0004219382NG06B	950	3	1.00418	1.02103	-1.7%	0.276
0001733041QT08D	950	2	1.00191	1.01870	-1.6%	0.268
0000037721QT54D	1000	2.5	0.99582	1.01329	-1.7%	0.264
0004224655NGEEA	950	1.5	1.00206	1.01886	-1.6%	0.251
0001796431QT819	950	2.5	1.00090	1.01764	-1.6%	0.236
0004224648NGB1C	950	1.5	1.00206	1.01886	-1.6%	0.234
0004219384NG1E4	950	1.5	1.00418	1.02106	-1.7%	0.232
0001796331QT71B	950	2.5	1.00090	1.01764	-1.6%	0.229
0002343401QT6E4	1000	2.75	0.99617	1.01364	-1.7%	0.224
0001832141QT653	950	35	1.00183	1.01802	-1.6%	0.218
0004203258NG01D	950	1.5	1.00418	1.02106	-1.7%	0.208
0004224651NGFE0	950	3	1.00206	1.01883	-1.6%	0.208
0004217242NG640	950	1.5	1.00418	1.02106	-1.7%	0.198
0002344371QT8DB	700	2.5	0.99614	1.00830	-1.2%	0.197
0004217248NG4D1	950	1.5	1.00418	1.02106	-1.7%	0.188
0000649631QT5FA	1000	3	0.99611	1.01358	-1.7%	0.187
0004221889NG19D	950	1.5	1.00418	1.02106	-1.7%	0.182
0000187351QT674	1000	1.5	0.99617	1.01366	-1.7%	0.170
0004220818NG39F	950	1.5	1.00418	1.02106	-1.7%	0.165
0004222015NGF89	950	3	1.00418	1.02103	-1.7%	0.160
0001733701QTD2A	950	2.5	1.00191	1.01869	-1.6%	0.150

ICP	MSD /				%	volume
	Gentrack	Registry	temp factor	temp factor	difference	impact (GJ
	Network	Network	(Inc JT) MSD /	(Inc JT)	0.9%)	
	Pressure	Pressure	Gentrack	Registry		
000170551107010	050	2.5	1.00000	4.04764	4.50/	0.1.10
0001796511Q1C48	950	2.5	1.00090	1.01764	-1.6%	0.148
0004217375NG576	950	1.5	1.00418	1.02106	-1.7%	0.147
0000908341QT1ED	700	140	0.99554	1.00526	-1.0%	0.143
1001270324QT9D8	1000	7	0.99669	1.01410	-1.7%	0.142
0000303691QT5E3	700	3	0.99614	1.00829	-1.2%	0.130
0001696801QT781	950	2	1.00183	1.01861	-1.6%	0.128
0004219381NGCAB	950	1.5	1.00418	1.02106	-1.7%	0.111
0001826091QTC74	560	2	1.00217	1.01199	-1.0%	0.092
1000525350PG0D7	950	3	1.00418	1.02103	-1.7%	0.092
0000315771QTB7C	700	35	0.99614	1.00772	-1.1%	0.082
0000299291QT40A	700	7	0.99614	1.00822	-1.2%	0.080
0004221884NGEC6	950	1.5	1.00418	1.02106	-1.7%	0.076
0000037631QT6E4	1000	1.5	0.99582	1.01331	-1.7%	0.073
1000609607PGEE9	560	2.5	1.00119	1.01098	-1.0%	0.068
0004227810NG5EB	950	3	1.00418	1.02103	-1.7%	0.065
1002177264QT166	700	70	0.99554	1.00649	-1.1%	0.064
1000589553PG779	560	2.5	1.00206	1.01187	-1.0%	0.061
0001796341QT246	950	2.5	1.00090	1.01764	-1.6%	0.047
0000824981QTA29	1000	3	0.99617	1.01364	-1.7%	0.045
0004202114NG305	950	1.5	1.00418	1.02106	-1.7%	0.041
0000294391QT72E	700	7	0.99614	1.00822	-1.2%	0.040
0004224647NG4C2	950	3	1.00206	1.01883	-1.6%	0.038
0004224836NGBD1	950	2.5	1.00206	1.01884	-1.6%	0.036
0004217507NG6A8	950	1.5	1.00418	1.02106	-1.7%	0.036
0004225440NG2AF	950	3	1.00206	1.01883	-1.6%	0.032
0004224793NG18E	950	2.5	1.00206	1.01884	-1.6%	0.016
1001296835NG245	700	2.5	0.99752	1.00971	-1.2%	0.014
0000304571QT83A	1000	3	0.99617	1.01364	-1.7%	0.003
0004203261NG9B4	950	7	1.00418	1.02096	-1.6%	0.001
0000370021QT90E	1000	2.75	0.99611	1.01358	-1.7%	0.000
0001733071QT775	950	2	1.00191	1.01870	-1.6%	0.000
0002339141QT5BD	700	140	0.99614	1.00588	-1.0%	0.000
0004223920NGD97	950	2.5	1.00206	1.01884	-1.6%	0.000
0004226880NGBAC	950	3	1.00418	1.02103	-1.7%	0.000
1002137834QT8F1	1000	2.75	0.99611	1.01358	-1.7%	0.000

ICP	MSD / Gentrack Network Pressure	Registry Network Pressure	temp factor (Inc JT) MSD / Gentrack	temp factor (Inc JT) Registry	% difference FT (± 0.9%)	volume impact (GJ
0001000363NGE5F	700	1.5	0.99259	1.00468	-1.2%	
0004220744NG786	950	1.5	1.00418	1.02106	-1.7%	
0004219958NG5B2	950	2.5	1.00418	1.02104	-1.7%	
0004221985NGB87	950	3	1.00418	1.02103	-1.7%	
0004228390NGACF	950	35	1.00418	1.02045	-1.6%	

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ICP	MSD / Gentrack Network Pressure	Registry Network Pressure	temp factor (Inc JT) MSD / Gentrack	temp factor (Inc JT) Registry	% difference FT (± 0.9%)	volume impact (GJ
0000037681QT456	1000	1.5	0.99582	1.01331	-1.7%	0.395
0000037641QT3B9	1000	3	0.99582	1.01328	-1.7%	0.000
0004202375NGAB7	950	1.5	1.00418	1.02106	-1.7%	0.101
0000682911QTCF0	700	1.5	0.99614	1.00831	-1.2%	0.092
0001008396NGE07	700	2.75	0.99605	1.00820	-1.2%	0.174
0000664751QT0E3	700	3	0.99614	1.00829	-1.2%	0.198
1000589556PGA36	560	2.5	1.00206	1.01187	-1.0%	0.090

# Appendix 2 – Control Rating Definitions<sup>1</sup>

Rating	Definition
	<ul> <li>The design of controls <u>overall is ineffective</u> in addressing key causes and/or consequences.</li> </ul>
Ineffective	<ul> <li>Documentation and/or communication of the controls does not exist (e.g. policies, procedures, etc.).</li> </ul>
	The controls are <u>not in operation</u> or have not yet been implemented.
	<ul> <li>The design of controls <u>only partially</u> addresses key causes and/or consequences.</li> </ul>
Needs	Documentation and/or communication of the controls (e.g. policies, procedures, etc.) are
improvement	incomplete, unclear, or inconsistent.
	• The controls are not operating consistently and/or effectively and have not been implemented in full.
Acceptable	• The design of controls is largely adequate and effective in addressing key causes and/or consequences.
	The controls (e.g. policies, procedures, etc.) have been formally documented but not proactively
	communicated to relevant stakeholders.
	• The controls are <u>largely operating in a satisfactory manner</u> and are providing some level of assurance.
	<ul> <li>The design of controls is <u>adequate and effective</u> in addressing the key causes and/or consequences.</li> </ul>
Effective	• The controls (e.g. policies, procedures, etc.) have been formally documented and proactively
	communicated to relevant stakeholders.
	<ul> <li>The controls overall, are <u>operating effectively</u> so as to manage the risk.</li> </ul>

<sup>&</sup>lt;sup>1</sup> All relevant systems and processes in place

### Appendix 3 – Impact Rating Definitions<sup>1</sup>

Rating	Definition
Insignificant	<ul> <li>A <u>small number of issues</u> with registry file timeliness and/or accuracy. <u>Negligible</u> <u>impact</u> on other participants or consumers. <u>Did not prevent</u> the process completing.</li> <li>A <u>small number of issues</u> with the accuracy and/or timeliness of files to the Allocation Agent. Corrections <u>were</u> made by the interim allocation. A <u>small number of issues</u> not related to registry or allocation information.</li> </ul>
Minor	<ul> <li><u>Some issues</u> with registry file timeliness and/or accuracy. <u>Minor impact</u> on other participants or consumers. <u>Did not prevent</u> the process completing.</li> <li><u>Some issues</u> with the accuracy and/or timeliness of files to the Allocation Agent. Corrections <u>were</u> made by the interim allocation. A <u>small number of issues</u> not related to registry or allocation information.</li> </ul>
Moderate	<ul> <li>A <u>moderate number of issues</u> with registry file timeliness and/or accuracy. <u>Moderate</u> <u>impact</u> on other participants or consumers. <u>Did prevent</u> some processes completing.</li> <li><u>A moderate number of issues</u> with the accuracy and/or timeliness of files to the Allocation Agent. Corrections <u>were not</u> made by the interim allocation. A <u>moderate</u> <u>number of issues</u> not related to registry or allocation information.</li> </ul>
Major	<ul> <li>A <u>significant number of issues</u> with registry file timeliness and/or accuracy. <u>Major</u> <u>impact</u> on other participants or consumers. <u>Did prevent</u> some processes completing.</li> <li><u>A significant number of issues</u> with the accuracy and/or timeliness of files to the Allocation Agent. Corrections <u>were not</u> made by the interim allocation. A <u>significant</u> <u>number</u> of issues not related to registry or allocation information.</li> </ul>

<sup>&</sup>lt;sup>1</sup> These ratings are indicative and will be used as a guide only, to aid the Market Administrator's assessment of alleged breaches.

# Appendix 4 – Remedial rating Definitions

Rating	Definition
Completed	The alleged breach and impact have been resolved. Systems and processes are now compliant.
In progress	Steps are being taken to resolve the alleged breach and impact and ensure systems and processes are compliant.
No action	Participant undertakes no action to resolve or address auditor controls or impact assessments for commercial reasons.

### **Appendix 5 – Genesis Energy Comments**

Genesis Energy would like to thank Crosshaven Consulting for the time and effort they have put into competing this audit, and the recommendation they have made on the back of this,

We are fully committed to further enhancing our controls and improving our compliance and will address the remaining recommendations from this audit as detailed in the relevant non compliances above.

We are in the process of upgrading our billing platform / CRM upgrade and making sure that this helps to resolve compliance issues that stem from current system constraints is a priority. We expect this to bring significant compliance benefits.