VERITEK

# Gas Downstream Reconciliation Performance Audit Final Report

For

**Nova Energy Limited**

Prepared by Steve Woods – Veritek Ltd

Date of Audit: 29/07/14 to 31/07/14

Date Audit Report Complete: 17/12/14

# Executive Summary

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

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

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

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

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

- An altitude factor of "1" is used for 1,354 ICPs resulting in errors greater than those allowed by NZS 5259:2004
- The use of incorrect meter pressure information has led to the submission of incorrect consumption information to the allocation agent for at least 14 ICPs.
- Nova uses the same temperature for each gas type rather than each gas gate. This approach will achieve compliance for some gas types where the relevant gas gates are all in the same region, but compliance will not be achieved for gas types where the gas gates are in different regions with different temperatures.
- There are at least 32 ICPs with the incorrect allocation group recorded in the registry.
- When meter pressure is found to be incorrect, adjustment is not made for prior periods.
- The energy consumption calculation for TOU ICPs has the following issues:
    - Compressibility factors are not applied for most ICPs
    - Altitude factors are not applied
    - Temperature adjustment is applied twice, once by the corrector and then again in Orion.
- Estimated TOU consumption information has been submitted to the allocation agent on a number of occasions. Nova Energy's processes achieve compliance with the requirement to provide its "best estimate of consumption information"; however, the existence of estimated information is considered a matter of non-compliance.

- Nova has under recorded consumption information for an ICP at the DAN05001 gas gate by approx. 8,956 GJ for the period April 2013 to April 2014. The faulty meter at ICP 0002037101QT36C which resulted in the under recorded consumption has been removed and replaced; consumption at this ICP is now being recorded correctly. Nova Energy are currently working with the affected parties in order to resolve the under submission of gas consumption at the DAN05001 Gas Gate which may have occurred between the period of April 2013 – April 2014.
- The initial submission accuracy did not meet the required accuracy percentage for some gas gates for the period May 2012 to April 2013.

## Summary of Report Findings

| Issue | Section | Control Rating<br>(Refer to Appendix 1 for definitions) | Compliance Rating | Comments |
|---|---|---|---|---|
| ICP set up information | 2.1 | Adequate | Not compliant | Some ACTV ICPs should be recorded at ACTC.<br>Some time delays exist with the registry update systems and processes.<br>An altitude factor of "1" is used for 1,354 ICPs resulting in errors greater than those allowed by NZS 5259:2004. |
| Metering set up information | 2.2 | Adequate | Not compliant | Some meter pressure and meter dial discrepancies exist between Nova Energy's and meter owners' records.<br>I recommend that monthly validation occurs for meter dials and that all meter pressure discrepancies are investigated before adopting the meter owner's pressure figures. |
| Billing factors | 2.3 | Adequate | Not compliant | Nova uses the same temperature for each gas type rather than each gas gate. This approach will achieve compliance for some gas types where the relevant gas gates are all in the same region, but compliance will not be achieved for gas types where the gas gates are in different regions with different temperatures |
| Archiving of reading data | 3.1 | Effective | Compliant | Effective practices are in place for archiving of register reading data. |

| | | | | |
|---|---|---|---|---|
| Meter interrogation requirements | 3.2 | Adequate | Not compliant | There are at least 32 ICPs with the incorrect allocation group recorded in the registry. |
| Meter reading requirements | 3.3 | Effective | Compliant | Meter reading attainment processes are robust. |
| Non TOU validation | 3.4 | Effective | Compliant | A robust validation process is in place before and after invoicing. |
| Non TOU error correction | 3.5 | Adequate | Not compliant | Corrected data automatically flows through to the relevant revision files for stopped meters.<br><br>When meter pressure is found to be incorrect, adjustment is not made for prior periods. |
| TOU validation | 3.6 | Adequate | Compliant | Nova Energy is in the process of moving the validation responsibility from Wellington to Auckland and there is currently no check against volume derived from register readings. I recommend this process is re-implemented as soon as practicable. |
| Energy consumption calculation | 4 | Not adequate | Not compliant | The energy consumption calculation for TOU ICPs has the following issues:<br>• Compressibility factors are not applied for most ICPs<br>• Altitude factors are not applied<br>• Temperature adjustment is applied twice, once by the corrector and then again in Orion. |

| | | | | |
|---|---|---|---|---|
| TOU estimation and correction | 5.1 | Adequate | Not compliant | Nova Energy's processes achieve compliance with the requirement to provide its "best estimate of consumption information".<br><br>The existence of any estimated TOU consumption information is considered a matter of non-compliance. This issue is addressed on a monthly basis and breach allegations are in existence in all cases.<br><br>Nova has under recorded consumption information for an ICP at the DAN05001 gas gate by approx. 8,956 GJ for the period April 2013 to April 2014. The faulty meter at ICP 0002037101QT36C which resulted in the under recorded consumption has been removed and replaced; consumption at this ICP is now being recorded correctly. Nova Energy *are* currently working with the affected parties in order to resolve the under submission of gas consumption at the DAN05001 Gas Gate which may have occurred between the period of April 2013 – April 2014. |

| | | | | |
|---|---|---|---|---|
| Provision of retailer consumption information | 5.2 | Adequate | Not compliant | The process for preparing consumption information files is compliant; however the following issues have resulted in the submission of incorrect consumption information to the allocation agent.<br>• Over recording of consumption due to incorrect altitude information.<br>• Over recording of TOU consumption due to the altitude factor not being applied.<br>• Incorrect consumption information due to incorrect meter pressure.<br>• Incorrect consumption information due to the application of temperature correction twice for TOU ICPs.<br>• Under recording of consumption at the Dannevirke gas gate due to a faulty meter. |
| Initial submission accuracy | 5.3 | Effective | Not compliant | Nova Energy uses historic seasonal adjustment daily shape values to improve the accuracy of forward estimates. Although compliance has not been achieved, the process is robust. |
| Forward estimates | 5.4 | Effective | Compliant | Nova Energy uses historic seasonal adjustment daily shape values to improve the accuracy of forward estimates. |
| Historic estimates | 5.5 | Effective | Compliant | Compliance was achieved for all of the scenarios provided during the audit. |
| Proportion of HE | 5.6 | Effective | Compliant | Reporting has been provided as required. |

| | | | | |
|---|---|---|---|---|
| Billed vs consumption comparison | 5.7 | Effective | Compliant | Small variances exist between billed and consumption information. Although these figures cannot be directly compared, they provide a useful indicator to ensure that under reporting of consumption information is not occurring. |

# Persons Involved in This Audit

Auditor:

Steve Woods
**Veritek Limited**

Nova Energy personnel assisting in this audit were.

| Name | Title |
|---|---|
| Charles Tiechert | Manager |
| Natasha Dauphin | Operations Manager |
| Neill Deppe | Energy Analyst |
| Rob Duncan | Metering and New Connections Team Leader |
| Nigel Gallagher | Operations Analyst |
| Pankaj Kumar | Billing co-ordinator |

Service providers assisting with processes within the audit scope:

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

# Contents

# 1. Pre-Audit and Operational Infrastructure Information

## 1.1 Scope of Audit

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

65. Industry body to commission performance audits

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

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

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

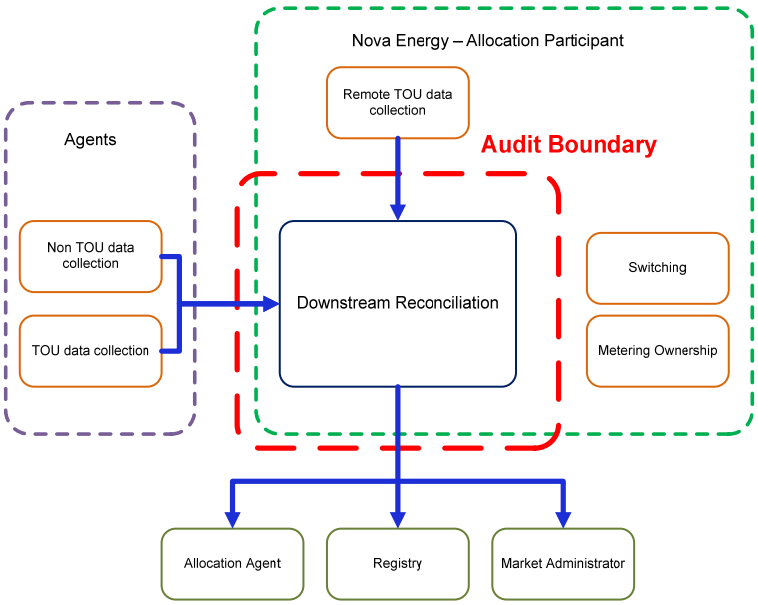
65.2.2 The systems and processes of the allocation agent or that allocation participant that have been put in place to enable compliance with these rules.

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

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

- Auckland – 29/07/14 and 30/07/14
- Wellington – 30/07/14 and 31/07/14

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



## 1.2 Audit Approach

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

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

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

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

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

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

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

## 1.3 General Compliance

### 1.3.1 Summary of Previous Audit

Nova Energy provided a copy of their previous audit conducted in 2011 by Veritek Ltd. Twelve of the seventeen areas evaluated were found to be compliant. Five breach allegations were made in relation to the remaining areas. The resolution of these matters is summarised in the table below.

| Breach Allegation | Rule | Section in this report | Resolution |
|---|---|---|---|
| An altitude factor of "1" is used for all ICPs. This does not achieve compliance for approximately 4,850 ICPs. | 26.2.1, & 28.2 | 2.1.2 | This matter is mostly resolved; however there are still 1,354 ICPs with an altitude factor of "1". |
| The use of incorrect meter pressure information has led to the submission of incorrect consumption information to the allocation agent for 1,143 ICPs. | 26.2.1, & 28.2 | 2.2, & 5.2 | This matter is mostly resolved; however there are still at least 14 ICPs with incorrect meter pressure factors. |
| There are approximately 1,700 ICPs with the incorrect allocation group recorded in the registry. | 29 | 3.2 | This matter is mostly resolved; however there are still at least 32 ICPs with incorrect allocation groups. |
| Estimated TOU consumption information has been provided on a number of occasions. Nova Energy's processes achieve compliance with the requirement to provide its "best estimate of consumption information"; however, the existence of estimated information is considered a matter of non-compliance. This issue is addressed on a monthly basis.<br><br>Some estimated data is not correctly identified. | 30.3 | 5.1 | Estimated TOU consumption data has still been supplied to the allocation agent. |
| The initial submission accuracy did not meet the required accuracy percentage for every gas gates for the period October 2008 to January 2011. | 37.2 | 5.3 | This matter is still present for a small number of gas gates. |

### 1.3.2 Breach Allegations

Nova Energy has 744 alleged breaches recorded by the Market Administrator between March 2011 and June 2014. These are summarised as follows:

| Nature of Breach | Rule | Quantity | Section in this Report |
|---|---|---|---|
| Switching Breaches | | 49 | Not within audit scope |
| Submission of estimated TOU data | 30.3 31.1, 32.1 & 33.1 | 197 | 5.1 |
| Initial vs final allocation variances | 37.2 | 479 | 5.3 |
| Late submission | 31 | 2 | 5.2 |
| Incorrect submission information | 26.2.1, 31 & 31.1 | 8 | 5.2 |
| Incorrect pressure factors and altitude information used | 26.2.1, & 28.2 | 2 | 2.1.2 & 2.2 |
| Incorrect allocation group | 29 | 1 | 3.2 |
| Late meter reading reports | 40.2 | 4 | 3.3 |
| Incorrect quantities billed information | 26.2.1, 52.2.1 | 1 | 5.7 |
| Late trading notification | 39.2.3 | 1 | |

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

| Breach Allegation | Rule | Section in this report |
|---|---|---|
| An altitude factor of "1" is used for 1,354 ICPs resulting in errors greater than those allowed by NZS 5259:2004 | 26.2.1, & 28.2 | 2.1.2 |
| The use of incorrect meter pressure information has led to the submission of incorrect consumption information to the allocation agent for at least 14 ICPs | 26.2.1, & 28.2 | 2.2, & 5.2 |
| Nova uses the same temperature for each gas type rather than each gas gate. This approach will achieve compliance for some gas types where the relevant gas gates are all in the same region, but compliance will not be achieved for gas types where the gas gates are in different regions with different temperatures. Variations greater than approx. 3º Celsius will result in conversion errors greater than 1.1% as allowed by NZS 5259:2004. | 26.2.1, & 28.2 | 2.3.1 |
| There are at least 32 ICPs with the incorrect allocation group recorded in the registry. | 29 | 3.2 |
| When meter pressure is found to be incorrect, adjustment is not made for prior periods. | 26.2.1 and 26.3 | 3.5 |
| Estimated TOU consumption information has been provided on a number of occasions. Nova Energy's processes achieve compliance with the requirement to provide its "best estimate of consumption information"; however, the existence of estimated information is considered a matter of non-compliance. This issue is addressed on a monthly basis. | 30.3 | 5.1 |

| Breach Allegation | Rule | Section in this report |
|---|---|---|
| The energy consumption calculation for TOU ICPs has the following issues:<br>• A compressibility factor is only applied to three ICPs, although 92 of 125 ICPs have a meter pressure greater than 50kPa. This will result in conversion errors greater than the allowable error of 0.2% allowable in accordance with Table 3 of NNS 5259:2004.<br>• An altitude factor is not applied, although most ICPs have correction for gauge pressure and temperature, not absolute pressure and temperature. Nova Energy has over recorded consumption information for TOU ICPs by approximately 0.2%, assuming an average meter pressure of 300 and an average altitude of 60m. Whilst this is within the allowable threshold of ± 0.5% recorded in Table 3 of NZS 5259:2004, I recommend altitude adjustment is applied.<br>• All TOU metering systems have correction for temperature; however Orion is also applying a temperature factor, so the temperature factor is applied twice. This will result in under recording of consumption information when the temperature is above 15º Celsius and over recording when the temperature is below 15º Celsius.<br>Compliance is not achieved with rule 28.2, which requires that *"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 for metering equipment installed at each consumer installation for which the retailer is the responsible retailer."* | 26.2.1, & 28.2 | 4 |
| Nova has under recorded consumption information for an ICP at the DAN05001 gas gate by approx. 8,956 GJ for the period April 2013 to April 2014. | 26.2.1 and 26.3 | 5.1 |
| The initial submission accuracy did not meet the required accuracy percentage for some gas gates for the period May 2012 to April 2013. | 37.2 | 5.3 |

I have also made breach allegations against some distributors in relation to incorrect altitude figures on the registry. They are shown in the table below.

| Breach Allegation | Participant Identifier | Rule(s) | Section in this report |
|---|---|---|---|
| Altitude figure incorrect for one ICP. | UNLG | 26.5.1 & 26.5.4 | 2.1.2 |
| Altitude figures incorrect for two ICPs. | POCO | 26.5.1 & 26.5.4 | 2.1.2 |
| Altitude figures incorrect for 15 ICPs. | NGCD | 26.5.1 & 26.5.4 | 2.1.2 |

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

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

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

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

## 1.5 Draft Audit Report Comments

A draft audit report was provided to the industry body (GIC), the allocation agent, and allocation participants that I considered had an interest in the report. In accordance with rule 70.3 of the 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 response was received.

| Party | Response | Comments provided | Attached to this report |
|---|---|---|---|
| Contact Energy | Yes | Yes | No |
| Nova Energy | Yes | Yes | Yes |

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

- In Section 5.1, I have clarified that the breach allegation for under submission of TOU consumption information only relates to the month of February 2014.
- In Section 5.1, I have noted that under submission of TOU consumption information has the potential to lead to incorrect SADSV files and AUFG factors.
- In each relevant section, I have inserted Nova's comments in relation to each recommendation and breach allegation.

## 1.6 Transmission Methodology and Audit Trails (Rule 28.4.1)

The audit trail was evaluated for all data gathering, validation and processing functions. This rule requires that "The consumption information supplied to the allocation agent in accordance with rules 29 to 40 is transferred in such a manner that it cannot be altered without leaving a detailed audit trail..." Compliance is confirmed with this rule in relation to consumption information supplied to the allocation agent. During the previous audit I found that when consumption information was replaced, the original file was not retained. Nova Energy adopted my recommendation that all versions of files are retained for audit trail purposes and all files are now retained.

The supporting information for TOU corrections is now appropriately filed and was easy to access.

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

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

Compliance with this rule 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 22/12/11 when examining the set up and maintenance of information.

## 2.1 ICP Set Up Information

### 2.1.1 New Connections Process

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

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

A check of ICPs that are in the submission file but not active on the registry is carried out regularly. The list file contains 633 ICPs with a status of ACTV. All ACTV ICPs remain in the meter reading cycle and all consumption information is included in submission files to the allocation agent. A check of a sample of ACTV ICPs showed that many had customers registered and therefore should have had a status of ACTC. Whilst there is no impact on the accuracy of consumption information, there would be an effect on the winning retailer if any of these ICPs switched out. I recommend that Nova Energy checks all ICPs at ACTV and updates the registry to ACTC for all ICPs with a customer recorded.

The event detail report for March and April 2014 was analysed. 167 ICPs were reconnected (status change to ACTC). The average time to update the registry was 8.3 days. Six ICPs took greater than 20 days to be updated. A check of these ICPs found that three were delayed due to backdated switches where the vacant status was changed to active once the switch was completed. The remaining three were updated as soon as the paperwork had been received from the field.

There were 25 new connections with an average time to update the registry of 7.16 days. Four of these took longer than 10 days to be updated in the registry. These were checked and it was found that three were due to a backlog of work and one was delayed due to the new connection commencing with another Retailer which required Nova to have to manually request the connection information from Powerco. When an ICP is established in Orion for a proposed new connection, a “proposed connection date” field is populated. Monitoring is in place to identify those ICPs where this date has passed without the receipt of a livening notification. There is also monitoring of situations where a livening notification has been provided but a meter docket has not been received. Customer information is provided by the distributor at the time the ICP is first established for the proposed new connection. This process includes appropriate steps to minimise the late notification to the registry and to ensure consumption information is provided to the allocation agent at the earliest opportunity.

There were 31 ICPs with a status change to ACTV with an average update to registry of 13 days. One ICP took 244 days to be updated. The delay in updating this ICP was due to late confirmation from AMS that the meter had been removed.

There were 56 ICPs with a status change to INACT with an average update to registry of 87 days. 24 of these took greater than 20 days to be updated. The registry status update process is manual. A sample was checked and it was found they were updated late because the status had been changed in Orion but not updated on the registry. A report is run regularly to check for status mismatches and it appears that the status comparison is not identifying these. I recommend that the report is reviewed to ensure these are being captured.

| Recommendation | Audited party comment |
|---|---|
| Nova Energy checks all ICPs at ACTV and updates the registry to ACTC for all ICPs with a customer recorded. | Response: Recommendation accepted.<br><br>Comments:<br>• Nova Energy is currently investigating ACTV and ACTC Registry Status'.<br>• Updates to the Registry will be made when we are satisfied the status changes are correct.<br>• Time frame for completion is 1 February2015. |

| Recommendation | Audited party comment |
|---|---|
| Regularly monitor the status mismatch reporting to identify differences between Orion and the registry, specifically where Orion has been updated with a status change but the registry has not. | Response: Recommendation accepted.<br><br>Comments:<br>• Nova Energy is monitoring the status of any/all mismatches within Orion and the registry on a daily basis.<br>• Updates to the Registry will be made when we are satisfied the status changes are correct.<br>• Time frame for implementation of regular status changes will occur from 1 February2015. |

### 2.1.2 Altitude Information

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

NZS 5259:2004 Amendment No1, which was published in November 2009, contains the following requirements regarding the way that altitude information should be managed.

1. The maximum permissible error has been reduced from ± 1.5% to ± 1.0% where the meter pressure is below 100kPa and ±0.5% where the meter pressure is greater than 100kPa.

2. The following note is also included "To minimise uncertainty due to altitude factor the aim should be to determine the altitude to within 10m where practicable."

Nova Energy's policy is to use the altitude figures on the registry for ICPs with an altitude above 100m. I checked Nova Energy's non TOU records and found the following issues with the use of altitude:

- 33 ICPs have a meter pressure greater than or equal to 100kPa and are above 45m, but have an altitude factor of 1. This will not achieve compliance with point 1 above.

- 1,321 ICPs have a meter pressure less than 100kPa and are above 90m, but have an altitude factor of 1. This will not achieve compliance with point 1 above.

- Nova Energy's policy is to adjust for altitude for ICPs above 100m but there are still 922 ICPs where this has not been applied.

Nova Energy provided a registry list file and a random sample of ICPs per distributor was checked against "google earth" data. The sample was selected by firstly looking for obvious outliers and then increasing the sample size through random selection. The "google earth" data is based on the "Shuttle Radar Topography Mission" (SRTM) results and a number of recent studies indicate an accuracy of ± 10m for altitude. An evaluation against this data is considered an appropriate test for "reasonableness". Altitude figures that are within approximately 90m of the actual altitude will ensure an accuracy of ± 1.0%. Point 2 above recommends altitude figures are determined to within 10m where practicable. An evaluation of altitude data on the registry was conducted to check whether this recommendation had been met. As noted above, the margin of error of the "google earth" data appears to be approximately ± 10m, therefore, to allow for this margin, I have checked that the registry data is within 20m of "google earth" data.

As shown in the table below the altitude data on the registry for non TOU ICPs appears to be very accurate in most areas. NGCD has 15 ICPs where the altitude figure differs by more than 20m and also by more than 90m.

| Distributor | Total ICPs | ICPs checked | Quantity outside 20m | Quantity outside 90m |
|---|---|---|---|---|
| UNLG | 6,968 | 25 | 0 | 0 |
| NGCD | 4,356 | 25 | 15 | 15 |
| POCO | 19,353 | 25 | 0 | 0 |
| GNET | 296 | 20 | 0 | 0 |
| Total | 30,973 | 95 | 15 | 15 |

A further evaluation was conducted of ICPs where the altitude figure was zero on the registry. This data appears to be less accurate than when a figure other than zero is populated. The results are shown in the table below. There are 54 of 68 ICPs with an altitude difference of more than 20m and three of these ICPs have an altitude difference of more than 90m.

| Distributor | Total ICPs | ICPs with altitude of zero | ICPs checked | Quantity outside 20m | Quantity outside 90m |
|---|---|---|---|---|---|
| UNLG | 6,968 | 285 | 30 | 30 | 1 |
| NGCD | 4,356 | 0 | 0 | 0 | 0 |
| POCO | 19,353 | 81 | 38 | 24 | 2 |
| GNET | 296 | 0 | 0 | 0 | 0 |
| Total | 30,973 | 366 | 68 | 54 | 3 |

I have considered whether distributors have potentially breached any rules by populating the registry with inaccurate altitude information. Distributors have responsibility for populating the registry with altitude figures[2] and for maintaining the accuracy of this information. Distributors must also comply with rule 26.5 of the Gas (Downstream Reconciliation) Rules 2008, which requires them to ensure that any information on the registry is accurate and complete and supports compliance with NZS 5259. There are 18 ICPs where the incorrect altitude figure has resulted in consumption information being high, and outside the threshold allowed by NZS 5259, by between 1.1% and 4.6%. I have

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

alleged a breach of rules 26.5.1 and 26.5.4 by UNLG (1 ICP), NGCD (15 ICPs) and POCO (2 ICPs). Nova Energy is not in breach of the same rules but is in breach of rule 28.2, which requires retailers to comply with NZS 5259 when converting volume to energy.

Nova Energy is required to correct the altitude factors in their systems and they must ensure corrections are made for at least those ICPs where the altitude difference is greater than 90m. These corrections are required to flow through to the relevant revision files.

I recommend that Nova Energy liaise with distributors to determine whether many of the ICPs with an altitude of zero should have more accurate figures populated.

Nova Energy does not adjust for altitude for any TOU ICPs. Some metering systems may correct for absolute pressure and therefore altitude adjustment is not required, but in most cases correction will occur for gauge pressure and therefore altitude adjustment is required. Nova Energy has over recorded consumption information for TOU ICPs by approximately 0.2%, assuming an average meter pressure of 300 and an average altitude of 60m. This is within the allowable threshold of ± 0.5% recorded in Table 3 of NZS 5259:2004, but I recommend adjustment for altitude is conducted.

| Non Conformance | Description | Audited party comment |
|---|---|---|
| Regarding: Rule 26.2.1, & 28.2<br><br>Control Rating: Adequate | An altitude factor of "1" is used for 1,354 ICPs resulting in errors greater than those allowed by NZS 5259:2004 | Response: Non Conformance accepted.<br><br>Comments:<br>• Nova Energy plans to apply an altitude factor to the 1354 identified ICP's by 1 March 2015.<br>• If errors in altitude factors are identified as part of the GIC/RAIG working group Nova Energy will remedy any errors in July2015. |

## 2.2 Metering Set-up Information

During the previous audit, 1,143 meter pressure discrepancies were identified between Nova Energy's information and that provided by the meter owner. Meter dockets, or other records, were requested from meter owners to confirm the accuracy of their data for a sample of 129 discrepancies. This analysis showed that the meter pressure information originally supplied by the meter owner was incorrect for nine ICPs. I concluded that retailers could not rely on the meter pressure data in meter owner's databases to correct their databases, without further supporting information from either meter dockets or site visits.

I conducted the same analysis during this audit and found 138 discrepancies, as shown in the table below.

| Meter Owner | Total ICPs | Meter Pressure Discrepancies | Meter Dial Discrepancies |
|---|---|---|---|
| NGC | 22,360 | 106 | 291 |
| Powerco | 8,760 | 31 | 69 |
| Gas Net | 385 | 1 | 18 |
| Total Discrepancies | | 138 | 378 |

I checked meter dockets or other information on-site for six ICPs and found Nova was correct in two instances, the meter owner had correct information in two instances and two were being investigated further to confirm if the whose data was correct.

Meter dockets, or other records, were requested from meter owners to confirm the accuracy of their data for a further sample of 19 discrepancies. This analysis showed that the meter pressure information originally supplied by the meter owner was incorrect for five ICPs. A summary of this analysis is shown below.

| Meter owner | Discrepancies Evaluated | Meter Owner Data Incorrect |
|---|---|---|
| NGCM | 8 | 4 |
| Powerco | 10 | 1 |
| Gas Net | 1 | 0 |
| Totals | 19 | 5 |

Nova Energy conducted field pressure tests for nine ICPs and found the following:

- The meter owner and Nova Energy figures were incorrect for two ICPs
- The meter owner and Nova Energy figures were correct for one ICP
- Nova Energy was incorrect and the meter owner was correct for six ICPs

I consider that this sample size is sufficient to draw the conclusion that retailers cannot rely on the meter pressure data in meter owner's databases to correct their databases, without further supporting

information from either meter dockets or site visits. I recommend that Nova Energy check the meter dockets for all discrepancies to determine the correct meter pressure.

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

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

| Non Conformance | Description | Audited party comment |
|---|---|---|
| Regarding: Rules 26.2.1 & 28.2.<br><br>Control Rating: Adequate | The use of incorrect meter pressure information has led to the submission of incorrect consumption information to the allocation agent for at least 14 ICPs | Response: Non Conformance accepted.<br><br>Comments:<br>• Nova Energy is currently part of the GIC/RAIG project which is validating all data mismatches within the GIC Registry.<br>• It is intended that part of this work will capture meter pressure discrepancies.<br>• It is envisaged that when the data is 'clean' all/any meter pressure information errors will be adjusted.<br>• The time frame for completion of the GIC/RAIG project is 1 July 2015. |

| Recommendation | Audited party comment |
|---|---|
| 138 meter pressure discrepancies were found between Nova Energy's and meter owners' records. 28 meter pressure discrepancies were examined through field checks or by checking meter dockets. Meter owner figures were incorrect for seven of 28 examples. I Meter dockets be checked for all remaining discrepancies prior to making changes. | Response: Recommendation accepted.<br><br>Comments:<br>• Nova Energy is part of the current GIC/RAIG project that is validating all data mismatches within the GIC Registry.<br>• It is part of the intent of Nova Energy to capture and resolve all of the 138 Nova Energy-specific meter pressure discrepancies identified as part of this audit when the data clean-up has occurred.<br>• The time frame for completion of the GIC/RAIG project is 1 July 2015. |

| Recommendation | Audited party comment |
|---|---|
| 378 meter dial discrepancies were found between Nova Energy's and meter owners' records. I recommend that validation occurs on a monthly basis with meter owners to address this matter. | Response: Recommendation accepted.<br><br>Comments:<br>• Nova Energy is part of the current GIC/RAIG project that is validating all data mismatches within the GIC Registry.<br>• It is part of the intent of Nova Energy to capture and resolve all of the 378 Nova Energy-specific meter dial discrepancies identified as part of this audit when the data clean-up has occurred.<br>• The time frame for completion of the GIC/RAIG project is 1 July 2015. |

## 2.3 Billing Factors

### 2.3.1 Temperature Information

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

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

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

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

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

Nova Energy has chosen option (c) and they apply the daily weighted average temperature for the billing/read-read period. Option (c) seems to be the most logical choice because it matches the majority of GMS installations. Nova Energy has advised that the source of the data is a file from NIWA, although it is unclear what date this data was provided. Nova uses the same temperature for each gas type rather than each gas gate. This approach will achieve compliance for some gas types where the relevant gas gates are all in the same region, but compliance will not be achieved for gas types where the gas gates are in different regions with different temperatures. Gas type X covers South Auckland to Whangarei and NIWA's National Climate Database shows temperature differences on the same day and time of 4º Celsius. Gas type T covers Belmont to Hastings and these temperatures can vary by 6º Celsius. Variations greater than approx. 3º Celsius will result in conversion errors greater than 1.1% as allowed by NZS 5259:2004.

I recommend the temperature data is refreshed and applied per gas gate rather than per gas type.

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

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 NZS5259.

This also reinforces that adjustment for the Joule Thompson effect is desirable. Nova Energy applies the Joule Thompson effect adjustment and the formula was checked and confirmed correct. However the network pressure is populated with the same figure as the meter pressure for approx. 23,000 ICPs so there will be no adjustment applied for these ICPs. There are 95 ICPs where the pressure reduction, based on registry figures, would result in a change of temperature greater than 3º Celsius and therefore greater than the 1.1% error permissible in Table 3 of NZS5259:2004. I have not recorded a breach allegation because I am not certain of the accuracy of the network pressure populated in the registry.

The accuracy of the adjustment is reliant on correct meter pressures and correct network pressures. Several participants have stated that the accuracy of network pressure information is not of a high enough standard for them to rely on it to for the purposes of Joule Thomson adjustment. Compliance with Table 3 of NZS 5259:2004 is a retailer responsibility and there are approx. 100 ICPs where the pressure reduction would result in a change of temperature greater than 3º Celsius and therefore greater than 1.1%. Confirming the accuracy of network pressure is not within the scope of this audit, so I recommend Nova Energy, in conjunction with Gas Industry Company, liaises with network owners to ensure network pressure is populated correctly on the registry.

| Non Conformance | Description | Audited party comment |
|---|---|---|
| Regarding: Rules 26.2.1, & 28.2<br><br>Control Rating: Adequate | Nova uses the same temperature for each gas type rather than each gas gate. This approach will achieve compliance for some gas types where the relevant gas gates are all in the same region, but compliance will not be achieved for gas types where the gas gates are in different regions with different temperatures. | Response: Non Conformance accepted.<br><br>Comments:<br>• Nova Energy is in the process of initiating a project to refresh all billing temperature data within the Orion database and as part of this will investigate options to allocate temperature data to more refined regions.<br>• The time frame to complete the project is 1 July 2015. |

| Recommendation | Audited party comment |
|---|---|
| Temperature data to be refreshed and applied per gas gate rather than per gas type in each region. | Response: Noted<br>Comments:<br>• For resolution plan see response to Rules 26.2.1, & 28.2above. |

| Recommendation | Audited party comment |
|---|---|
| Nova Energy in conjunction with the Gas Industry Company is to liaise with network owners to ensure network pressure is populated correctly on the registry. | Response: Recommendation accepted.<br>Comments:<br>• Nova Energy is part of the current GIC/RAIG project that is validating all data mismatches within the GIC Registry.<br>• It is intended that when the registry data is clean-up is completed the Network Owners will be contacted to verify all network pressures populated in the registry are true and correct.<br>• The time frame to complete this work is 1 July 2015. |

### 2.3.2 Calorific Values

Gas composition data is sourced from the Open Access Transmission Information System (OATIS) and is loaded into Orion. Each day is originally populated with the figure for the same day of the previous year, which is replaced by the actual figures from OATIS. The accuracy of the Orion information was confirmed by comparing an OATIS file with the contents of Orion.

# 3. Meter Reading and Validation

## 3.1 Archiving of Register Reading Data (Rule 28.4.2)

Retailers are required to keep register reading data for a period of 30 months. Data was examined during the audit and it is confirmed that Nova Energy securely archives data for a period in excess of 30 months.

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

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

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

Nova Energy conducts analysis of consumption every 6 to 12 months to ensure ICPs are in the correct allocation groups. The most recent analysis by Nova found the following:

- 97 ICPs have annual consumption exceeding 250GJ with allocation group 6 recorded in the registry. Not all of these ICPs have a full year of consumption and the 250GJ threshold may not be reached for the full year, but there are still 15 ICPs with consumption exceeding 350GJ and 5 where the consumption exceeds 1,000GJ.
- 102 allocation group 4 ICPs have consumption less than 250GJ per annum but most of these are only just below the threshold and Nova Energy intends to leave these as allocation group 4 in case their consumption increases.
- 12 allocation group 4 ICPs have consumption greater than 10TJ and most of these have consistent consumption which is likely to remain over 10TJ per annum.

The use of incorrect allocation groups is alleged as a breach of rules 29.1 to 29.3. I recommend Nova Energy conducts allocation group validation on a monthly basis.

| Non Conformance | Description | Audited party comment |
|---|---|---|
| Regarding: Rule 29<br><br>Control Rating: Adequate | There are at least 32 ICPs with the incorrect allocation group recorded in the registry. | Response: Non Conformance accepted.<br><br>Comments:<br>• An allocation group 4 and 6 updates have been completed, which includes resolving the 20 allocation group 6 ICPs identified during the audit as exceeding 350 GJ.<br>• Nova Energy will undertake discussions with each of the allocation group 4 customers who have reached an annual consumption exceeding 10 TJ to determine whether their usage profile is expected to continue to exceed this level.<br>• Nova Energy confirms that regular reporting of all allocation groups will be implemented, including identifying future customers who exceed the 10TJ annual consumption threshold. |

| Recommendation | Audited party comment |
|---|---|
| Nova Energy to conduct analysis of consumption to ensure ICPs are in the correct allocation groups monthly. | Response: Recommendation accepted.<br><br>Comment:<br>• See response for Rule 29 above. |

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

All consumer installations with non-TOU meters must have register readings recorded at least once every 12 months unless exceptional circumstances prevent such an interrogation.

Nova Energy provided a copy of the GAS080 reports for April 2014.

| Target | Reading Percentage (GAS080) |
|---|---|
| Rolling 4 months (target 90%) | 97.09 |
| 12 months (target 100%) | 97.21 |

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

There were only two ICPs that have not been read for 12 months. Nova has attempted to gain access on several occasions for both these unread sites and I consider that exceptional circumstances exist for both.

## 3.4 Non TOU Validation

Meter reading validation occurs at multiple levels.

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

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

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

- Meter not found for a premise
- High reading
- Low reading
- Meter reading already present in the system
- Another reading exists for the same day
- Meter could not be read

- Meter reading date is earlier than existing billed reads

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

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

- High dollar amount
- Negative dollar amount
- Long billing days
- Short billing days
- High percentage variation from previous bill
- Electricity consumption without gas consumption

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

## 3.5 Non TOU Error Correction

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

Error correction was examined by a "walk through" of the process and by examining three examples where meters had stopped recording and five examples where the meter pressure was corrected.

The correction process for stopped meters has been changed since the beginning of 2014 and now includes a step to remove the old meter from Orion at a higher estimated reading to cater for the estimated unrecorded volume. This process results in consumption information appearing in the relevant revision files. Prior to 2014, estimation was not conducted for the period the meter was not recording, although the process was correct during the 2011 audit.

The correction process for meter pressure was also examined. From sampling five examples it was determined that there was no correction applied to previous periods. This is a breach of rules 26.2.1 and 26.3. I recommend a process is established to ensure meter pressure correction results in correct consumption information for prior periods.

| Non Conformance | Description | Audited party comment |
|---|---|---|
| Regarding: Rules 26.2.1 and 26.3<br><br>Control Rating: Adequate | When meter pressure is found to be incorrect, adjustment is not made for prior periods. | Response: Non Conformance accepted.<br><br>Comments:<br>• Nova Energy is currently reviewing the Standard Operating Procedures and related training materials. This review will ensure that good processes are in place to ensure meter pressure correction results in correct consumption information for prior periods |

| Recommendation | Audited party comment |
|---|---|
| Nova Energy to establish a process to ensure meter pressure correction results are recording correct consumption information for prior periods. | Response: Recommendation accepted.<br><br>Comment:<br>• See response for Rules 26.2.1 and 26.3 above. |

## 3.6 TOU Validation

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

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

Whilst the Account Managers review each invoice each month to identify any anomalies, there are no other validation checks against volume derived from register readings.

Nova Energy is in the process of moving the validation responsibility from Wellington to Auckland and I recommend the process to validate attains volume derived from register readings is re-implemented as soon as practicable.

| Recommendation | Audited party comment |
|---|---|
| Nova Energy to ensure the process for checking volume derived from register readings is re-implemented as soon as practicable following the relocation of the validation responsibility from Wellington to Auckland. | Response: Recommendation accepted.<br>Comments:<br>• Monthly TOU Validation checking is now in place prior to monthly invoices being processed.<br>• A volume validation process is being developed that also includes checking possible accuracy errors.<br>• The time frame to complete this work is 1 July 2015. |

# 4. Energy Consumption Calculation (Rule 28.2)

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

Nova should adjust for compressibility for all ICPs where the meter pressure is above 50 kPa; however there are 25 non TOU ICPs with meter pressure above 50 kPa where compressibility is not applied. I recommend Nova Energy adjusts for compressibility for these 25 ICPs.

The calculation for TOU ICPs has the following issues:

- A compressibility factor is only applied to three ICPs, although 92 of 125 ICPs have a meter pressure greater than 50kPa. This will result in conversion errors greater than the allowable error of 0.2% allowable in accordance with Table 3 of NNS 5259:2004.
- An altitude factor is not applied, although most ICPs have correction for gauge pressure and temperature, not absolute pressure and temperature. Nova Energy has over recorded consumption information for TOU ICPs by approximately 0.2%, assuming an average meter pressure of 300 and an average altitude of 60m. Whilst this is within the allowable threshold of ± 0.5% recorded in Table 3 of NZS 5259:2004, I recommend altitude adjustment is applied.
- All TOU metering systems have correction for temperature; however Orion is also applying a temperature factor, so the temperature factor is applied twice. This will result in under recording of consumption information when the temperature is above 15º Celsius and over recording when the temperature is below 15º Celsius.

Compliance is not achieved with rule 28.2, which requires that *"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 for metering equipment installed at each consumer installation for which the retailer is the responsible retailer."*

| Non Conformance | Description | Audited party comment |
|---|---|---|
| Regarding: Rules 26.2.1, & 28.2 | The energy consumption calculation for TOU ICPs has the following issues:<br><br>Compressibility factors are not applied for most ICPs<br><br>Altitude factors are not applied<br><br>Temperature adjustment is applied twice, once by the corrector and then again in Orion. | Response: Non Conformance accepted.<br>Comments:<br>• Nova Energy is part of the current GIC/RAIG project that is validating all data mismatches within the GIC Registry. It is part of the intent of this project to ensure that all compressibility and altitude errors will be corrected.<br>• All owners of TOU equipment have been requested to provide the transducer types (Gauge or Absolute) and model numbers so that validation of when to apply an altitude factor at a TOU customer site can be validated.<br>• All owners of TOU equipment have been requested to provide confirmation of where there is a TOU installed so that single temperature adjustment can be applied correctly.<br>• The time frame for completion of the GIC/RAIG project is 1 July 2015. |

| Recommendation | Audited party comment |
|---|---|
| Altitude adjustment occurs for all ICPs, TOU and Non TOU | Response: Recommendation accepted.<br><br>Comment: See response for Rules 26.2.1, & 28.2 above. |

| Recommendation | Audited party comment |
|---|---|
| Review TOU conversion factors to ensure compressibility, altitude and temperature factors are correct. | Response: Recommendation accepted.<br><br>Comment: See response for Rules 26.2.1, & 28.2. above. |

# 5. Estimation and Submission Information

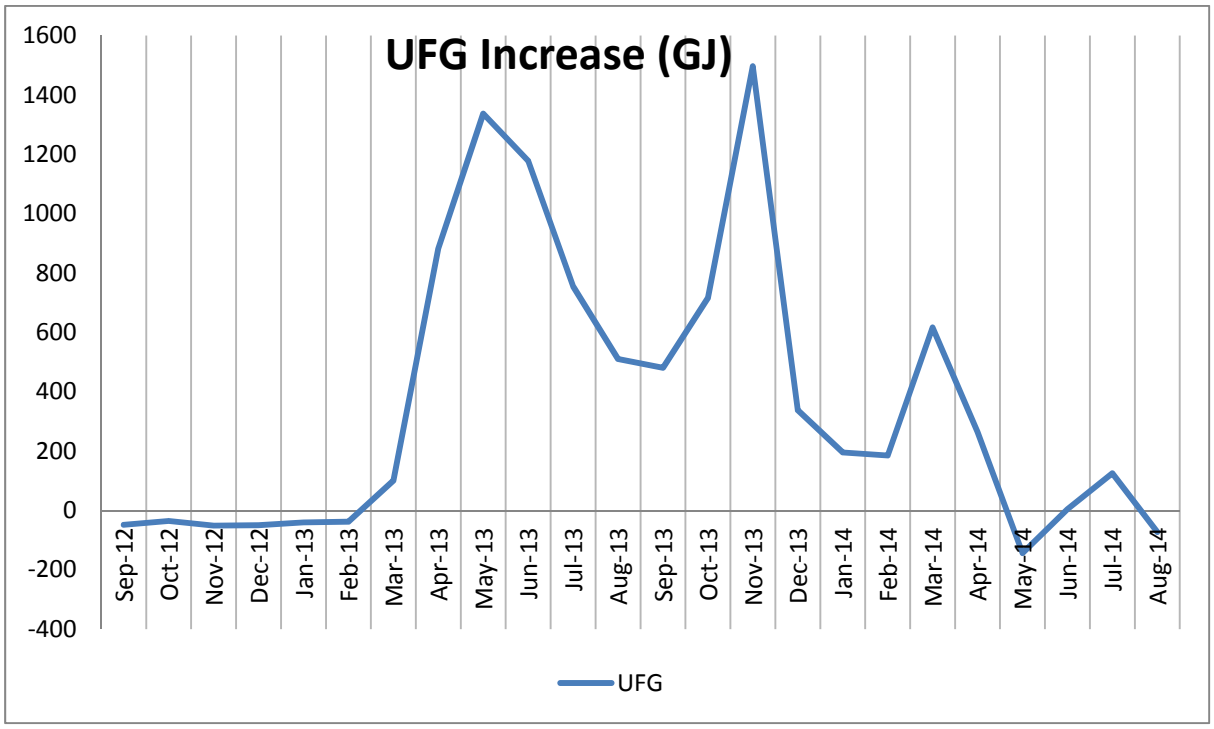
## 5.1 TOU Estimation and Correction (Rule 30.3)

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

Various methods are used depending on the nature of the issue. If data is missing and a register reading is available then a profile is created by using a similar previous period. The customer may be consulted if the profile is unclear. If data and register readings are missing then previous consumption periods are used in conjunction with customer liaison to determine a likely profile.

Ten examples were examined and I conclude Nova Energy's processes achieve compliance with the requirement to provide its "best estimate of consumption information" for nine ICPs.

A specific issue was examined in relation to a suspected faulty meter at an ICP at the DAN05001 gas gate. Data was estimated for the period November 2013 to January 2014, but the estimation was not conducted for February 2014 for the initial submission. The meter was not replaced until April 2014. Two issues are present here, firstly the meter should have been changed earlier and secondly an estimate should have been conducted for February 2014. A breach allegation (2014-049) has already been made in relation to an estimate not being conducted for February 2014. In addition to these points, the UFG at the DAN05001 gas gate increased sharply in April 2013 and remained high until April 2014, when the meter was changed. The graph below shows the increase.



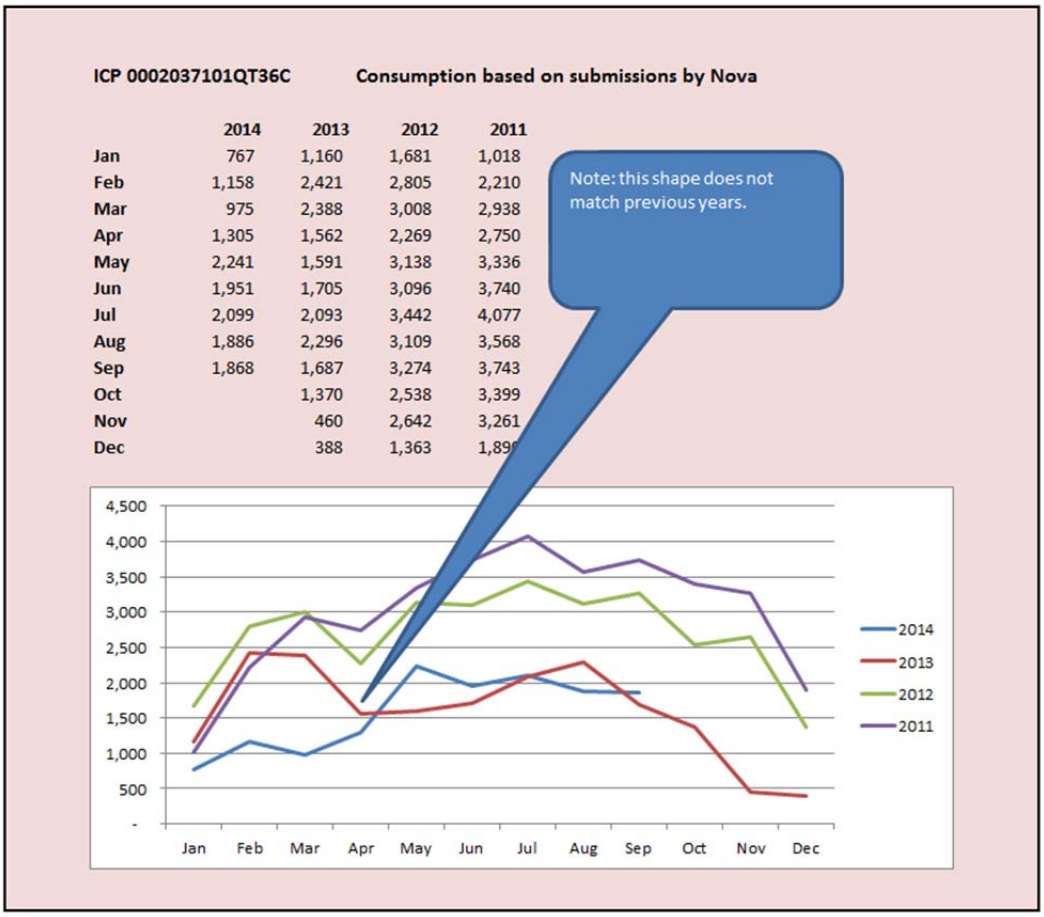

The meter owner reported that the meter was recording intermittently and that the amount of under recording could not be determined. Despite the inability to directly calculate the level of under recording from meter test results, I have conducted further investigations and I have concluded that

Nova has under recorded consumption information for their ICP at the DAN05001 gas gate by approx. 8,956 GJ for the period April 2013 to April 2014. My reasons are as follows:

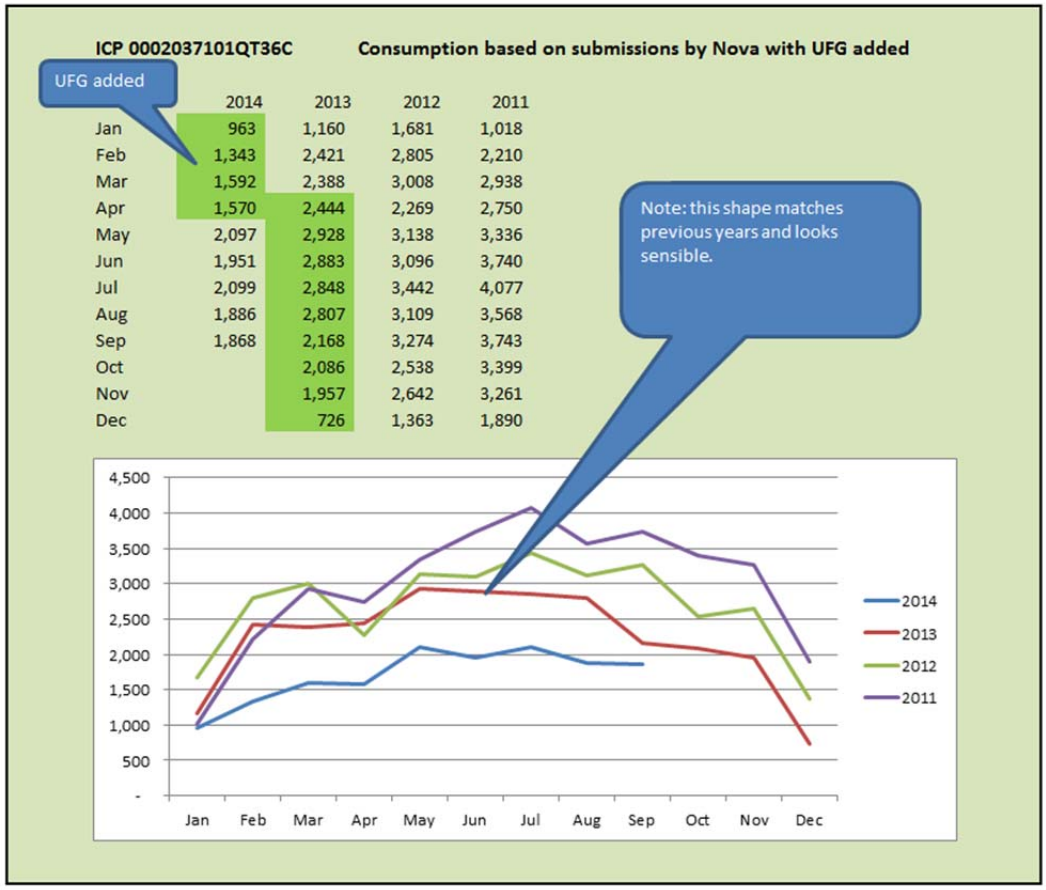
1. There are only two TOU ICPs at this gas gate, totalling 80% of the consumption for the gate.
2. The increase in UFG cannot be caused by any of the AG4 or AG6 ICPs because the consumption would need to drop to zero for all ICPs for all retailers to result in UFG of almost 9TJ.
3. The consumption pattern for the other TOU ICP closely matches historic consumption patterns and there is no indication the meter is recording low.
4. The graphs below show that the consumption information submitted to the allocation agent by Nova for the period April 2013 to April 2014 does not match the profile for previous years.
5. When I add the total UFG at the gate to the consumption information submitted to the allocation agent, the consumption profile closely matches that of previous years.

**ICP 0002037101QT36C** **Consumption based on submissions by Nova**

| | 2014 | 2013 | 2012 | 2011 |
|---|---|---|---|---|
| Jan | 767 | 1,160 | 1,681 | 1,018 |
| Feb | 1,158 | 2,421 | 2,805 | 2,210 |
| Mar | 975 | 2,388 | 3,008 | 2,938 |
| Apr | 1,305 | 1,562 | 2,269 | 2,750 |
| May | 2,241 | 1,591 | 3,138 | 3,336 |
| Jun | 1,951 | 1,705 | 3,096 | 3,740 |
| Jul | 2,099 | 2,093 | 3,442 | 4,077 |
| Aug | 1,886 | 2,296 | 3,109 | 3,568 |
| Sep | 1,868 | 1,687 | 3,274 | 3,743 |
| Oct | | 1,370 | 2,538 | 3,399 |
| Nov | | 460 | 2,642 | 3,261 |
| Dec | | 388 | 1,363 | 1,89 |



UFG




The faulty meter at ICP 0002037101QT36C which resulted in the under recorded consumption has been removed and replaced; consumption at this ICP is now being recorded correctly. Nova Energy is currently working with the affected parties in order to resolve the under submission of gas consumption at the DAN05001 Gas Gate which may have occurred between the period of April 2013 – April 2014. This issue also has the potential to lead to incorrect SADSV files and AUFG factors.

A second issue was also examined in relation to estimated data at TUK06501. Data was estimated for April 2014 immediately following switch in. The interim submission was 1,101.63GJ higher than the initial. The initial submission was low by 44%.

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

| Non Conformance | Description | Audited party comment |
|---|---|---|
| Regarding: Rules 26.2.1 and 26.3<br><br>Control Rating: Adequate | Nova has under recorded consumption information for their ICP at DAN05001 by approx. 8,956 GJ for the period April 2013 to April 2014 | Response: Non Conformance accepted<br><br>Comment:<br>• Nova Energy will initiate engagement with the GIC and other affected retailers and distributors to make the corrections and settle as appropriate and as soon as reasonably practicable. |

| Non Conformance | Description | Audited party comment |
|---|---|---|
| Regarding: Rule 30.3<br><br>Control Rating: Adequate | Estimated TOU consumption information has been provided on a number of occasions. The existence of estimated information is considered a matter of non-compliance. | Response: Noted.<br><br>Comments:<br>• Nova Energy will t investigate and put further processes in place to ensure that the factors leading to the estimation of TOU consumption information are minimised even further.<br>• As noted in the Audit Report Nova Energy's processes are adequate in this area. |

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

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

GAS040 and GAS050 files for June 2014 were examined and compared to the data in Nova Energy's system at ICP level; the totals matched which confirms compliance. This also proves that Nova Energy's consumption information provided to the allocation agent is calculated at ICP level and then aggregated.

The matter of "vacant consumption" was also examined. When an ICP is vacant but still active (ACTV on the registry), meter reading still occurs and any volume that is recorded is converted into validated consumption and is then included in the allocation process. When an ICP is vacant, a "dummy" customer is "moved in" to the account to ensure credit processes continue as expected and to ensure the consumption information is identified, validated and submitted.

As noted in previous sections, there are some issues which have led to the submission of incorrect consumption information to the allocation agent. The specific issues are as follows:

- Over recording of consumption due to incorrect altitude information.
- Over recording of TOU consumption due to the altitude factor not being applied.

- Incorrect consumption information due to incorrect meter pressure.
- Incorrect consumption information due to the application of temperature correction twice for TOU ICPs.
- Under recording of consumption at the DAN05001 gas gate due to a faulty meter.

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

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

## 5.3 Initial Submission Accuracy (Rule 37.2)

Final allocations are complete for the months October 2008 to January 2010. Rule 37.2 requires that the accuracy of consumption information, for allocation groups 3 to 6, for initial allocation must be within a certain percentage of error published by the industry body.

Nova Energy did not meet this requirement for a number of gas gates during the 12 month period shown. The results are summarised in the table below.

| Month | Total Gas Gates | Number Within 10% | % Compliant | Within +/-10% or < 200 GJ | % Compliant or immaterial |
|---|---|---|---|---|---|
| May 2012 | 107 | 72 | 67% | 100 | 94% |
| June 2012 | 104 | 84 | 81% | 102 | 98% |
| July 2012 | 105 | 92 | 88% | 103 | 98% |
| August 2012 | 106 | 88 | 83% | 106 | 100% |
| September 2012 | 108 | 82 | 76% | 105 | 97% |
| October 2012 | 108 | 84 | 78% | 107 | 99% |
| November 2012 | 113 | 90 | 80% | 112 | 99% |
| December 2012 | 113 | 63 | 56% | 111 | 98% |
| January 2013 | 113 | 91 | 81% | 113 | 100% |
| February 2013 | 116 | 74 | 64% | 114 | 98% |
| March 2013 | 74 | 63 | 85% | 74 | 100% |
| April 2013 | 75 | 55 | 73% | 72 | 96% |

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

| Month | Initial Submission All Gas Gates (GJ) | Final Submission All Gas Gates (GJ) | Percentage Variation |
|---|---|---|---|
| May 2012 | 503,667 | 508,485 | -0.95% |
| June 2012 | 553,581 | 555,963 | -0.43% |
| July 2012 | 577,584 | 578,610 | -0.18% |
| August 2012 | 535,246 | 534,884 | 0.07% |
| September 2012 | 469,022 | 472,199 | -0.67% |
| October 2012 | 426,439 | 427,676 | -0.29% |
| November 2012 | 377,599 | 378,883 | -0.34% |
| December 2012 | 306,633 | 300,127 | 2.17% |
| January 2013 | 273,507 | 272,395 | 0.41% |
| February 2013 | 268,235 | 269,363 | -0.42% |
| March 2013 | 306,794 | 303,486 | 1.09% |
| April 2013 | 341,690 | 343,547 | -0.54% |

The tables above show that the consumption information submitted to the allocation agent for the initial submission was sometimes over estimated and at other times under estimated. This analysis does not show any specific trends that cause concern.

Nova Energy monitors variances at gas gate and ICP level and this reporting showed all of the variances reported in the tables above relate to seasonal loads.

| Non Conformance | Description | Audited party comment |
|---|---|---|
| Regarding: Rule 37.2<br><br>Control Rating: Effective | The initial submission accuracy did not meet the required accuracy percentage for some gas gates for the period May 2012 to April 2013. | Response: Noted.<br><br>Comments:<br>• Nova Energy's performance in respect of rule 37.2 is effective.<br>• There are processes in place to resolve these breaches across all industry participants. |

## 5.4 Forward Estimates (Rules 34 & 36)

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

## 5.5 Historic Estimates (Rules 34 & 35)

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

| Test | Scenario | Test Expectation | Result |
|---|---|---|---|
| A | ICP's become Inactive part way through a month. | Consumption is only calculated for the Active portion of the month. | Compliant |
| B | ICP's become Active then Inactive within a month. | Consumption is only calculated for the Active portion of the month. | Has not occurred |
| C | ICP's become Inactive, then Active, then Inactive again within a month. | Consumption is only calculated for the Active portion of the month. | Has not occurred |
| D | ICP's Starts on the 1st day of a month. | Consumption is calculated to include the 1st day of responsibility. | Compliant |
| E | ICP's Ends on the Last Day of the month. | Consumption is calculated to include the last day of responsibility. | Compliant |
| F | ICP's Starts part way through a month. | Consumption is calculated to include the 1st day of responsibility. | Compliant |
| G | ICP's End part way through a month. | Consumption is calculated to include the last day of responsibility. | Compliant |
| H | ICP's are Lost and Won Back in a month. | Consumption is calculated for each day of responsibility. | Compliant |
| I | ICP's Start on 1st and End on Last day of month. | Consumption is calculated for each day of responsibility. | Has not occurred |
| J | Rollover Reads | Consumption is calculated correctly in the instance of meter rollovers. | Compliant |

## 5.6 Proportion of Historic Estimates (Rule 40.1)

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

## 5.7 Billed vs Consumption Comparison (Rule 52)

The content of the GAS070 files was proved by selecting some gas gates and checking the bills in Orion for all ICPs at those gates, against the total in the GAS070 files. This confirmed the accuracy of the data.

The table below shows a comparison between quantities billed and consumption information submitted to the allocation agent for a three year period. The consumption information is lower than quantities billed by 0.36%. This minor difference can be explained by the fact that the revision and normalisation processes for billed data are different to those for consumption data. Although these figures cannot be directly compared, they provide a useful indicator to ensure that under reporting of consumption information is not occurring.

| Year ending | Billed GJ | Consumption GJ | Percentage Difference |
|---|---|---|---|
| April 2012 | 8,906,661 | 8,798,476 | -1.21% |
| April 2013 | 8,745,215 | 8,823,874 | -0.90% |
| April 2014 | 8,754,742 | 8,689,603 | 0.74% |
| **Total** | **26,406,618** | **26,311,953** | **0.36%** |

# 6. Recommendations

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

- I recommend that Nova Energy checks all ICPs at ACTV and updates the registry to ACTC for all ICPs where a customer is currently recorded.
- Regularly monitor the status mismatch reporting to identify differences between Orion and the registry, specifically where Orion has been updated with a status change but the registry has not.
- I recommend altitude adjustment occurs for all ICPs, TOU and non TOU.
- 138 meter pressure discrepancies were found between Nova Energy's and meter owners' records. 28 meter pressure discrepancies were examined through field checks or by checking meter dockets. Meter owner figures were incorrect for seven of 28 examples. I recommend that meter dockets be checked for all remaining discrepancies prior to making changes.
- 378 meter dial discrepancies were found between Nova Energy's and meter owners' records. I recommend that validation occurs on a monthly basis with meter owners to address this matter.
- Nova Energy uses the same temperature data for each gas type rather than each gas gate. This approach will achieve compliance for some gas types where the relevant gas gates are all in the same region, but compliance will not be achieved for gas types where the gas gates are in different regions with different temperatures. I recommend the temperature data is refreshed and applied per gas gate rather than per gas type.
- Nova Energy applies the Joule Thompson effect adjustment and the formula was checked and confirmed correct. The accuracy of the adjustment is reliant on correct meter pressures and correct network pressures. Several participants have stated that the accuracy of network pressure information is not of a high enough standard for them to rely on it to for the purposes of Joule Thomson adjustment. I recommend Nova Energy, in conjunction with Gas Industry Company, liaises with network owners to ensure network pressure is populated correctly on the registry.
- Allocation group validation occurs periodically. I recommend this occurs monthly.
- I recommend a process is established to ensure meter pressure correction results in correct consumption information for prior periods.
- Nova Energy is in the process of moving the validation responsibility from Wellington to Auckland and there is currently no check against volume derived from register readings. I recommend this process is re-implemented as soon as practicable.
- Review TOU conversion factors to ensure compressibility, altitude and temperature factors are correct.

# Appendix 1 – Control Rating Definitions

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