SYSTEM CHANGE AUDIT

PAN PAC

Date of commencement: 10 September 2025

Report completed: 29 October 2025

Under the Gas (Downstream Reconciliation) Rules 2008 the Gas Industry Company commissioned Langford Consulting to undertake a performance audit of Pan Pac Forest Products Limited. The purpose of the audit is to assess whether, after the implementation of proposed system changes, the retailer will be able to be compliant with the rules.

Auditor Julie Langford

Executive Summary

This performance audit was conducted at the request of the Gas Industry Company (GIC) in accordance with rule 65 of the Gas (Downstream Reconciliation) Rules 2008. The audit was commissioned under rule 65.5 and its scope was therefore limited by rule 65.6 to the impact of the system change proposed by Pan Pac Forest Products Limited (Pan Pac) on the allocation agent or allocation participant's systems, processes and procedures.

The audit was conducted 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 the GIC in June 2013.

The engagement commenced on 10 September 2025 and was conducted remotely without a site visit. Pan Pac contract Energybridge to provide day-to-day management services. Energybridge representatives were therefore the main point of contact for this audit.

The purpose of the audit is to assess whether, after the implementation of the intended change, Pan Pac will be able to be compliant with the rules, with particular emphasis on the production of GAS040 and GAS050 files.

The auditor found no issues during the audit that should prevent Pan Pac from using their new system. It is anticipated that the implementation of the system change will enable Pan Pac to be compliant with the rules. The proposed controls were expected to be effective.

The auditor made the following recommendations:

> **RECOMMENDATION**: That Pan Pac establish a system for identifying if data has changed so that it can be reviewed and the best available data be used. This is likely to be the most recent data, but not necessarily.
>
> Pan Pac implemented this recommendation during the course of the audit.
>
> **RECOMMENDATION:** That an additional check that the date of the meter read is a valid date i.e. after the date of the previous read, be added to the system verifications.
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> This suggestion was implemented during the audit.
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> **RECOMMENDATION:** The auditor recommended that the existence of the temperature and gas type tables should be noted in the system documentation, along with where they had been sourced from and the need to confirm from time to time that the tables being used by DataBridge were up to date.
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> **RECOMMENDATION:** The Pan Pac validation process works well currently now because of the small amount of data being managed by a tight team with a close relationship to the business operations and the gas nominations. However, on the assumption that the system may be used for a larger number of sites in the future it is recommended that as the quantity of data managed is increased more formal systems and processes should be developed to validate the metering data.

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1. Pre-Audit and Operational Infrastructure Information

1.1 Proposed System Change and Scope of Audit

Under the Gas (Downstream Reconciliation Rules) Rules 2008 (the Rules) the Gas Industry Company (GIC) has commissioned Langford Consulting to undertake a performance audit of Pan Pac Forest Products Limited (Pan Pac) in its role as retailer. The audit was commissioned under rule 65.5 and its scope was therefore limited by rule 65.6 to the impact of the proposed change on the allocation agent or allocation participant's systems, processes and procedures.

The purpose of the audit is to assess whether, after the implementation of the intended change, Pan Pac will be able to be compliant with the rules.

In preparing the report, the auditor used the processes set out in the guideline note issued on 1 June 2013: *Guideline note for rules 65 to 75: the commissioning and carrying out of performance audits and event audits, version 3.0* (http://www.gasindustry.co.nz/dmsdocument/2858).

Pan Pac informed the GIC that they proposed to make a system change that affects its processes for the supply of information to the allocation agent under the Rules. The GIC asked the auditor to make enquiries about the nature of the proposed change and assess the risks to be reviewed. Pan Pac had recently undergone routine audits for both the downstream reconciliation and switching and registry processes so this audit is contained to the risks associated to the system change. The change was to add a database into their processes for managing TOU data and to create a system for managing non-TOU data.

1.2 The current system

Pan Pac commenced as a retailer registry participant on 21 February 2024 and has been audited once in February 2025. At that time, they were responsible for 1 TOU ICP so only produced GAS050s (not non-TOU GAS040s).

The previous audit described the Pan Pac system as follows:

> "All ICP data is held in a Master Metering Database, which is an Excel workbook. Pivot tables are used to interrogate the database. There is a separate workbook that uses the Master Metering Database data to create the GAS050 consumption information for submission. Metering data is handled by Bluecurrent and arrives via email as an HDR or DDR attachment.
>
> Excel spreadsheets are however prone to human error – either through transposition errors when data is entered or in the ability of the user to change data without a record being maintained.
>
> It should be emphasised that no instances of such errors occurring were found during this audit, but nonetheless the risk remains. The risks are mitigated by embedded checks and management review.
>
> Pan Pac is actively working on a plan to develop a cloud based database system which would include having an audit trail. The auditor highlighted the need to notify GIC of the system change prior to implementation.

As data services are provided by Bluecurrent who have demonstrated in past audits that their systems have appropriate audit trails, the auditor judged Pan Pac processes sufficient for now, although recommended more robust audit trails be made a priority in the new system."

That audit made the following observation and recommendation that were pertinent to this audit:

Observation

Pan Pac are planning system changes which will require notice to be given to GIC and an additional audit of the changes to occur.

Recommendation

The introduction of audit trails should be a priority for the system changes planned by Pan Pac.

Since the last audit Pan Pac had taken on responsibility for 2 non-TOU ICPs so part of the purpose of the system change was to build systems and processes to manage these sites, as well as to introduce a database to manage both the new non-TOU data and the existing TOU data.

1.3 Provision of Information to the Auditor (rule 69)

In conducting this audit, the auditor may request any information from Pan Pac, the Allocation Agent and any allocation participant.

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

The auditor considers that all parties have complied with the requirements of this rule.

2. System change – TOU sites

The proposed system change by Pan Pac was to establish a PostgreSQL database, rather than using Excel spreadsheets to manage the data. Other aspects of the system would stay the same.

Pan Pac would continue to receive HDRs and DDRs from Bluecurrent, so there is no requirement for the new system to begin doing data conversions for TOU data.

The database has an Excel front end to enable more user friendly access, it enables users to both view and change data in the database. The new system was called DataBridge.

As the previous system had only just been audited this system change audit could focus on ensuring that the new system produces the same result as the established/audited system, with an improvement in robustness/resilience such as improved audit trails and reduced opportunity for human error.

Pan Pac had done a parallel run of the new system and the old system and made the results available to the auditor. They provided the auditor with an Excel file used to capture the parallel run of the old and new systems as well as the resulting GAS050s. Initially it could be seen that the test had demonstrated a tiny difference between the GAS050 produced by each system (a trivial difference in the third decimal place). Further analysis by Pan Pac

demonstrated this was the result of the new system using HDR data and aggregating to daily figures, compared to using the DDR supplied by Bluecurrent. Pan Pac concluded using the HDR data was the better option and the auditor agreed. No other issues arose from review of the parallel run.

The auditor asked what happened if Bluecurrent pushed new data to DataBridge for a period where data had already been provided. The outcome is that the earlier data would be overwritten on the assumption that the most recent data is the best data available.

> **OBSERVATION**: That Bluecurrent data could be pushed to DataBridge and overwrite existing DataBridge data, the inherent assumption being that new data should be considered the best available data. However, it is possible this might not be the most desirable outcome.
>
> **RECOMMENDATION**: That Pan Pac establish a system for identifying if data has changed so that it can be reviewed and the best available data be used. This is likely to be the most recent data, but not necessarily.
>
> Pan Pac implemented this recommendation during the course of the audit.

The auditor discussed the backup arrangements for the new system with Pan Pac. There are two main components to the system: the PostgreSQL database hosted by Neon, and a set of Excel 365 front ends that live on Sharepoint. These Excel files interact with the database (in both directions - import and export), but all retailer data is stored in the database, there is no data stored in any Excel workbook.

The backup arrangements are:

- Database: an overnight job that takes a complete copy of the Neon database, compresses it and saves the compressed file elsewhere, so the risk is contained to losing no more than what happened that day. It has been verified that the restore process works as expected.
- Excel: the team are in the process of developing an automated job that will take a copy of the working set of folders on Sharepoint and saving all files locally, so that team members have independent copies of the Excel workbooks to restore from.

By coincidence a system incident occurred part way through the audit that required Pan Pac to implement its backup procedures. The controls put in place proved sufficient to reinstate the system, but the team obtained some learnings from the incident which will enable them to improve their systems to allow for two alternate backup approaches, depending on circumstances, making the controls stronger.

The auditor also discussed the audit trail arrangements for the new system. There are audit logs on the metering and allocation tables in DataBridge that log the exact date/time a file or piece of data was imported/exported/updated and can track both update and delete actions in all these tables. This means the state of the data can be reconstructed at any point in time and it is known who made any changes and when.

These backup processes and audit trail arrangements apply to the system for both TOU and non-Tou processes.

3. New system – non-TOU sites

Pan Pac had taken on the responsibility of 2 more sites since the last audit. From 1 July 2025 they were now responsible for two non-TOU sites, so new processes were required for the production of GAS040s.

These non-TOU processes are still done within the DataBridge system (i.e. the PostgreSQL database with an Excel front end), but the non-TOU data is not initially managed by Bluecurrent. The whole process, including energy conversion, is performed by Pan Pac using DataBridge.

The Pan Pac process was to get photos of the meters from site which were received by email on or near the last day of every month. The readings were then entered into DataBridge. As confirmation of the source of the readings the site photos are saved in a folder. The system does basic checks on the read entry, such as the resulting volumes not being negative, before allowing the user to proceed.

> **RECOMMENDATION:** That an additional check that the date of the meter read is a valid date i.e. after the date of the previous read, be added to the system verifications.
>
> This suggestion was implemented during the audit.

The user then initiates the system to pull the correct gas type information from OATIS. The most recent gas type information is always pulled, and if any is missing this is flagged up to the user to take action before proceeding. The user then prompts the system to calculate the billing factors. The data, now calculated as energy, is then pushed to the database. The system creates a record showing the username and date that the data was pushed to the database, to create an audit trail. When the reading is calculated and saved back to the database a link to the meter read photo is included in the saved record.

When the user is ready to create the GAS040 the data is pulled from the database, ensuring the most recent data is used.

The auditor reminded Pan Pac that records are required to be kept for at least 30 months – Pan Pac confirmed that this was understood and it would be their policy to keep the on-site photos for at least that length of time.

Pan Pac had elected to develop their own energy conversion processes for the non-TOU sites. They had chosen to conform to the ISO12213 methodology, in accordance with the options allowed for in NZS5259.

Pan Pac had embedded two tables into DataBridge to assist with the conversion process. The temperature table as supplied by GIC and the gas gate to gas type mapping as supplied by Firstgas via OATIS. These tables were confirmed as accurate back to the current versions of each. DataBridge pulls the most recent gas type information from OATIS via webservices. A sample of gas type data was confirmed as accurate back to OATIS.

> **OBSERVATION:** The temperature table and gas gate to gas type table do not often change, but Pan Pac processes should allow for and be alert to the possibility that these tables could change. There is a need to keep the version used in their system aligned with the most current versions.
>
> **RECOMMENDATION:** The auditor recommended that the existence of the temperature and gas type tables should be noted in the system documentation, along with where they

had been sourced from and the need to confirm from time to time that the tables being used by DataBridge were up to date.

This recommendation was implemented during the course of the audit.

The auditor asked how DataBridge would behave if source data (including temperature or gas type data) was missing. Pan Pac demonstrated how the system would alert the user to the missing data and would not proceed with the calculation without it. The user could then investigate and rectify the situation before proceeding.

The auditor asked if DataBridge adjusted for Joule-Thomson as well as compressibility. They confirmed that it did and showed how the system calculated the amount of adjustment required and where this was inserted into the calculation.

The auditor confirmed all the inputs for a sample calculation back to source:

Temperature back to the GIC table

Network pressure, meter pressure and altitude back to the gas registry

Gas type back to OATIS

Pan Pac provided the auditor with the energy calculation engine. They demonstrated how they had already tested this by entering sample data as provided by ISO12213 and confirming the results were as expected. They had also tested their outcomes against the deviation factor received from Bluecurrent in their TOU data set.

The auditor checked that the temperature, pressure and altitude factors produced by the energy conversion system correlated to expected outcomes. She also reviewed the compression factor calculation against a NX-19 calculator. ISO12213 and NX19 use different logic and inputs so an identical match was not expected, but for all scenarios tested the NX-19 and ISO12213 compression factors were the same to the first 3 decimal places.

The auditor also performed compression factor calculations repeatedly isolating each input in turn and testing that the outcome varied as expected when the isolated input was changed up and then down.

The auditor concluded that the energy calculation engine was working as expected.

Pan Pac noted that they were in the process of developing an integrity check to confirm that the data in DataBridge that is sourced from the gas registry is up to date. The intent was that, once built, this check would be undertaken once a month before running the end of month process to build the GAS040s. The auditor was happy that as they currently had only 2 sites and they had only just been set up the risk of divergence was currently very small, and that the intent was there to have a check in the future.

The auditor had provided Pan Pac with historic estimate scenarios that are routinely confirmed during the audit process to ensure all gas is accounted for once, without gaps or double ups between retailers. None of these scenarios had occurred for Pan Pac yet, other than a straightforward pick up of the sites from the previous retailer from 1 July. Pan Pac was aware of the need to build capability for the system to manage these scenarios and had already started working on a solution and a test script. The auditor was content this work did not need to be finished prior to the end of this audit but could be confirmed as successfully implemented in the next routine audit.

As noted in the TOU system change section above, Pan Pac do not have formal validation processes. Pan Pac themselves are managing only a very small number of sites currently and are very familiar with the data. They have a strong sense of what they are expecting the data to be because of their close relationship with operational staff and their other responsibilities relating to gas nominations. The day's data is added into a forecasting tool used for nominations so is always reviewed every day. The team are in regular contact with operations and have a very close understanding of expected gas use and any actual operational issues that might arise.

If the resulting data from the metering process was very different it would stand out to this small team.

> **RECOMMENDATIONS:** The Pan Pac validation process works well currently because of the small amount of data being managed by a tight team with a close relationship to the business operations and the gas nominations. However, on the assumption that the system may be used for a larger number of sites in the future it is recommended that as the quantity of data managed is increased, more formal systems and processes should be developed to validate the metering data (both TOU and non-TOU).

4. Conclusion

The auditor found no issues during the audit that should prevent Pan Pac from using their new system. It is anticipated that the implementation of the system change will enable Pan Pac to be compliant with the rules. The proposed controls were expected to be effective.

It is noted that the current system is handling a very small number of ICPs and that the main user of the system is also the system developer, who therefore has a strong technical knowledge of the process and of the expected outcomes. It will be interesting to see how the system and processes develop should the size of the dataset increase and/or the team grow. It is likely that over time more controls will be required.

The auditor made the following recommendations:

> **RECOMMENDATION**: That Pan Pac establish a system for identifying if data has changed so that it can be reviewed and the best available data be used. This is likely to be the most recent data, but not necessarily.
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Appendix 1 – Control rating definitions[1]

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

[1] All relevant systems and processes in place

Appendix 2 – Impact rating definitions[2]

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

[2] These ratings are indicative and will be used as a guide only, to aid the Market Administrator's assessment of alleged breaches.

Appendix 3 – 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.