Gas Allocation Agent

Performance Audit Report

Prepared for

Gas Industry Company

by

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Date Audit Report Complete: 3 February 2012

Contents

1. Executive summary

Audit ratings are allocated as follows:

Rating	Description	Performance level
5	Very good	Proactive, providing a high level of service and contributing to the success of the allocation process.
4	Good	Adequate to comply with the requirements under all reasonable circumstances.
3	Adequate	Adequate to comply with the requirements most of the time.
2	Poor	Inadequate to comply with the requirements under all reasonable circumstances.
1	Very poor	Significantly inadequate.

1.1 Summary of findings

The table below provides an overview of the findings of this audit at the time the audit was completed. Auditor comment is provided where it is considered relevant.

Subject	Section	Rating	Auditor comment
Contract Administration			
Personnel	3.1	4 : Good	Adequate to comply with the requirements under all reasonable circumstances.
Governance Policies	3.2	4 : Good	
Web site	3.3	4 : Good	Web site content and performance was improved during the audit.
Insurance	3.4	4 : Good	
Documentation	3.5	4 : Good	Maintenance of the system functional specification is a minor issue, this is being addressed.
Updating documentation	3.6	3 : Adequate	Adequate to comply with the requirements most of the time. Needs some improvement, refer section 3.5 above.
Managing exemptions	3.7	4 : Good	
Service management			Service management was significantly improved during the course of this audit with the re-introduction of the required service methodology.

Subject	Section	Rating	Auditor comment
Service methodology	4.1	4 : Good	
Help desk	4.2	4 : Good	
Performance standards	4.4	3 : Adequate	We expect actions taken during this audit will result in the required improvement.
Performance monitoring	4.5	3 : Adequate	We expect actions taken during this audit and those still proposed will result in the required improvement.
Incident reporting	4.6	4 : Good	
Identified issues	4.7	4 : Good	
Performance reviews	4.8	3 : Adequate	We expect actions taken during this audit will result in the required improvement.
Change management	4.9	4 : Good	
Relationship management	4.10	4 : Good	
Ensure specified system capacity	4.11	4 : Good	
Robustness of systems	4.12	4 : Good	
Allocation process			
Audit trails	5.3	4 : Good	
Receive consumption information	5.4	3 : Adequate	Automated checking for missing or extra information is not possible as the allocation system is not fully aware of the information it should expect. Consequently risk associated with human error is high, this would be reduced through integration with the registry.
Receive injection information	5.7	3 : Adequate	Allocation of injection quantities to retail gas gates is not entirely clear exposing the process to human error. This would be reduced through integration with the registry.
Perform allocation	5.9	4 : Good	
Annual reconciliation	5.12	4 : Good	
Allocation process tests	5.16	4 : Good	
Risk management			

Subject	Section	Rating	Auditor comment
Risk assessment	6.1	2 : Poor	Inadequate to comply with the requirements under all reasonable circumstances. Risk assessment process has been initiated.
Maintain data environment	6.2	4 : Good	
Data backup and recovery	6.3	1 : Very Poor	This rating is based on a lack of evidence that the sub contract for performing this task is in place with all parties clearly understanding their responsibilities.
Disaster recovery testing	6.4 & 3.5	4 : Good	Encompasses recovery of computer servers and data only.
Business continuity planning	3.5	1 : Very poor	Significantly inadequate. The service provider agreement is unclear as regards responsibility for business continuity planning for the allocation process. No relevant plan is in place, this matter should be addressed by the Industry body with the allocation agent contractor.

1.2 Summary of recommendations

The following recommendations describe specific areas where improvements could be made.

Section	Recommendation
3.5	Industry body urgently review business continuity planning for the Gas Allocation process.
7	a. Confirmation of injection and consumption values. b. Identifying the need for estimation of values. c. operation of the gate.

2. Introduction

2.1 About this audit

This audit has been planned and conducted in accord with the following documents:

- Standards published by the NZ Institute of Chartered Accountants (adapted).
- Gas (Downstream Reconciliation) Rules 2008.
- Gas industry Company guideline regarding audits.
- Gas Industry Company Allocation Agent (audit) terms of Reference .

2.2 Audit design criteria

The gas allocation agent performance audit is designed according to the following criteria.

From Gas rules 65 (paraphrased).

The purpose of a performance audit of the allocation agent is to assess;

- the performance of the allocation agent in terms of compliance with the rules, and
- the systems and processes of the allocation agent that have been put in place to enable compliance with the rules.

The adequacy of the systems and processes that have been put in place by the allocation agent is measured against the Gas Allocation Service Provider Agreement.

From NZICA standards (paraphrased and adapted).

In achieving this purpose the auditor will seek to obtain reasonable assurance[1] of;

- the accurate performance of each obligation required of the allocation agent under the rules and the allocation agent contract, and
- the robustness of the systems and procedures put in place by the allocation agent to meet those obligations.

The auditor will obtain reasonable assurance of compliance by gathering audit evidence using the following means as considered necessary and appropriate by the auditor;

- **inspection,** examination of records or documents including internal controls.
- **observation,** of processes or procedures (including internal controls).
- **external confirmation,** from external parties (including external controls),
- **recalculation,** Includes re-performance and analytical procedures,
- **enquiry**, asking people internal or external to the organization.

[1] As defined by the NZICA standards, refer ISA (NZ) 200.

2.3 Scope of audit

The scope of this audit encompasses the 30 months prior to commencement of the audit in June 2011, this period includes all activity since the inauguration of the gas allocation service. There is no previous audit to consider.

This audit examines a wide range of factors associated with business practice, risk mitigation and technical implementation. This audit does not attempt to replicate full technical testing of allocation process functionality as this would be a major undertaking and is considered beyond the scope of the audit.

2.4 Audit procedure

In early 2011 the present manager was appointed to head the NZX Energy group and a review of policies and procedures was undertaken. As a result of this review some desirable changes were identified and a staff member was employed to head service delivery.

This audit commenced in early June 2011 with a request for information followed by a site visit undertaken during the week of 13 June 2011. During that site visit, shortcomings were identified in NZX processes and procedures as measured against the requirements of the gas allocation agent service provider agreement. This provided useful clarification of the changes NZX needed to make.

The auditor, NZX and the Gas Industry Company agreed it would be appropriate to delay completion of this audit in order to encompass changes made by NZX to processes and procedures, ensuring the audit accurately reflects the present status of compliance against the service provider agreement.

During the period August to December 2011 significant procedural changes were implemented by NZX and relevant documentation was forwarded to the auditor. A further one day site visit was undertaken by us on 6 December 2011, and followed by release of this audit report in draft form.

This audit report focuses on all potential breaches of the rules by the Allocation Agent during the past 30 months, and while comment is made on compliance against the service provider agreement over that period, the primary focus in that respect is on the level of compliance achieved at the time of the second site visit.

2.5 Auditors ratings

The auditors conclusions are summarised at the end of each audit section according to the following table.

Rating	Descriptor	Performance level
5	Very good	Proactive, providing a high level of service and contributing to the success of the allocation process.
4	Good	Adequate to comply with the requirements under all reasonable circumstances.
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2	Poor	Inadequate to comply with the requirements under all reasonable circumstances.

1	Very poor	Significantly inadequate.

Alleged rule breaches are identified separately.

2.6 About the allocation agent contract

The allocation agent contract was initiated with The Market Place Company who constructed the custom built computer system that performs the allocation processing. The initial allocation was performed in November 2008.

The gas allocation contract and infrastructure was transferred by sale to NZX in June 2009.

Two important components are identified throughout this audit:

1. The computer system processes that gather information and calculate allocated quantities.
2. The Allocation Agents business processes associated with delivery of the allocation service as described in the Service Provider Agreement.

3. Contract administration

3.1 Personnel

Section 5 of the service provider agreement describes the personnel requirements the service provider must meet in order to provide the deliverables and services as and when necessary.

The NZX Energy Team Staffing Plan defines the level of staffing NZX provide to support the gas allocation agent contract. This staffing plan is supportive of the objectives for staffing set out in the service provider agreement.

Our findings regarding the implementation of the NZX Energy Team Staffing Plan are described below:

Management staff

The NZX Energy team has an overall manager responsible for the delivery of services across the NZX Energy portfolio including electricity and gas markets, and electricity distribution networks.

The NZX Energy Manager is a recent appointment (early 2011), performs the relationship management role for the gas contract and is listed as a key person under clause 5.4 of the service provider agreement.

Service delivery staff

Tasks necessary to the production of allocation process results and front line service delivery are undertaken by analysts who must have detailed knowledge of the allocation process and the fundamentals of front line service delivery.

These tasks are supported by computer systems including the allocation processing software and ITIL[2] help desk incident management and reporting software.

A primary analyst is dedicated to the Gas Allocation function. We note that this is a relatively new appointment who has attained medium qualification level on the NZX scale. Training and support is ongoing with the aim of this appointee achieving high qualification level.

The first alternate analyst listed in the staffing plan is outside the NZX Energy team and has primary responsibility to another division of NZX.

Two further analysts with primary responsibilities toward other functions within the NZX Energy team and having medium and low qualification level for gas, are available to this position in an emergency.

Technical support staff

The service provider agreement calls for the provision of custom designed software to perform the allocation processing along with the necessary infrastructure including hardware, database management, data retention and recovery, and computer performance management to facilitate the ongoing production of allocation results.

Technical support is provided in two categories.

[2] ITIL is an internationally recognized service delivery standard. The Allocation Agent is required by the service provider agreement to implement such a service management system.

- **Generic**: Much of the support is of generic infrastructure such as hardware, network connectivity and database administration which requires no specific knowledge of the gas allocation process and can readily be provided by persons trained in such tasks.
- **Specialised**: The most critical function is support[3] of the specialist software associated with the unique requirements of the gas allocation system. This support is provided by software development staff familiar with software tools and aided by the system documentation.

This support is provided by the NZX information technology team where various staff members are well qualified to attend to the generic matters arising. Two software developers are assigned to the gas process supporting each other in a buddy system.

In practice an in depth knowledge of the operation of the allocation process is very important, this knowledge is shared between service delivery staff and technical support staff.

Key persons and relationship manager

The service provider agreement clause 5.3 requires appointment of a relationship manager by both parties to the agreement. Clause 5.4 describes the requirements for key persons.

Our enquiries of the industry body as to compliance with these requirements revealed some concerns on their behalf at the high turnover of key persons over the past 3 years and the lack of familiarity with the gas industry and the allocation system when a key person has been appointed.

The service provider agreement clause 5.4.2 requires the allocation agent to provide the industry body with full details of proposed replacement key persons, and to obtain industry body approval prior to replacing key persons. The industry body advise us this process has not been followed in the past.

By the completion of this audit, NZX Energy are aware of the need to comply with this requirement for future appointments.

Observation and comment

The service provider agreement clause 5 requires the allocation agent to provide an adequate number of properly educated, trained, skilled, experienced and fully qualified staff for the obligations they perform.

The task of the allocation agent is highly specialised and while suitable human skills are available in the employee marketplace, suitable knowledge is not, and must be developed in house, this fact is recognised in the conditions of the service provider agreement[4]. The provision of suitably trained and qualified staff to perform the obligations of the allocation agent is therefore largely a matter of internal succession planning and staff training.

At the commencement of the audit we found there was no formal training for new staff and staff understanding of the allocation process was poor

We recommended a planned documented training program be created to impart to new staff a complete and accurate understanding of the gas industry, market operation and allocation process, and that staff not be placed on the “front line” until a satisfactory knowledge of this material is demonstrated (this should be monitored, at least for key persons, by the industry body under clause 5.4.2 of the service provider agreement).

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[3] Resolution of malfunctions and creation of new or modified functionality.

[4] By many employment standards these conditions may be considered excessive, however in the light that the gas allocation process determines very high values of financial exchange and is nationally important we consider them appropriate.

At the time of completing this audit a satisfactory staff planning process is in place and staff understanding of the allocation process has increased considerably. We are now confident that NZX Energy has processes in place to adequately train new staff.

Conclusion

At the completion of this audit our rating of contract administration (staffing) is:

4	Good	Adequate to comply with the requirements under all reasonable circumstances.

3.2 Governance policies

It is desirable that policies are in place to guide managers and staff as to the standards that are expected by those responsible for governance of an organisation. We consider this highly desirable when the organisation is implementing contractual arrangements that carry national significance as does the gas allocation contract.

Although no formal policies are in place we have observed material indicating to us that senior management have provided direction that NZX will provide excellent service to or exceeding the level described in the service provider agreement.

We consider the NZX Energy team is well supported and directed from the governance level to provide the level of service required under the service provider agreement.

This section is rated:

4	Good	Adequate to comply with the requirements under all reasonable circumstances.

3.3 Web site

The allocation agent is required to provide a web site for public information and for file exchanges with participants. The requirements for the web site are set out in rule 8 and in the service provider agreement.

Performance of web site

We initially experienced considerable difficulty using the web site because of long response delays and error messages. We reported this to the allocation agent and had to curtail of examination of the web site until satisfactory performance was regained.

An examination revealed that poor web site performance had gone undetected for some time. This was investigated and corrected by NZX Energy. Performance monitoring was instigated as discussed elsewhere in this audit report.

Content of web site

Rule 9.3 requires the allocation agent must ensure the information on the website is accurate and up to date. We initially noted a number of items not up to date including contact details, however during the course of the audit these have been corrected.

A change request is still outstanding to alter site functionality so as to make help available for users of the public site, and to update historic unaccounted for gas (UFG) figures as required.

Observation and comment

The primary purpose of the web site is to facilitate the exchange of information files between the allocation agent and participants. In terms of functionality this requirement has been well served, however in terms of website performance (availability and response time) it had not for some time.

We note that performance of the web portal had arisen as an issue in the past two annual allocation agent reports to the industry body and our brief survey of users indicated that performance had been an issue of concern for some time.

During this audit the web site performance was fully restored and a process introduced to monitor and report response times in the monthly report to the industry body. This, combined with the improved incident monitoring process through the ITIL compliant help desk, is expected to ensure ongoing performance meets the required standards.

At the completion of this audit we rate this section as :

4	Good	Adequate to comply with the requirements under all reasonable circumstances.

3.4 Insurance

Rule 10 and the service provider agreement clause 19.9 require that the allocation agent hold at a minimum public liability insurance of $10M and professional indemnity insurance of $10M.

Insurance documents were requested and provided.

Document 1: Comprehensive crime and liability (directors and officers) to the sum of $10M for any single loss and in the aggregate, and civil liability to the sum of $20M for any loss and in the aggregate.

Insurance is valid from 31 December 2010 to 31 December 2011.

The insurance is underwritten 50% by Lloyd's Underwriter Syndicate and 50% by XL Insurance Company Limited, London.

Document 2: General Liability Insurance to the value of $10M for any loss and in the aggregate.

Insurance document signed and dated 25 January 2011.

Insurance underwritten by Lumley General Insurance.

Notes:

a. A list of insured entities is included in the contract, this list does not include NZX Energy. We queried this with NZX and are assured that NZX Energy is not a separate entity and the insurance is valid under the NZX umbrella..

b. Exclusions in document 2 include (but are not limited to) any damage arising directly or indirectly out of internet usage, damage to computer data or programs arising through the use of any computer system or hardware. The matters excluded from document 2 appear to be covered by document 1.

It appears to the auditor that the conditions prescribed in the rules and the SPA are met by the policies held by NZX, however we cannot warrant this is so and recommend the industry body have the documents examined by an insurance expert if any doubt remains.

Based on our observation and understanding we rate this section as:

4	Good	Adequate to comply with the requirements under all reasonable circumstances.

3.5 Documentation

The service provider agreement clause 10 requires provision and maintenance of the documents listed in schedule 1.11 of the service provider agreement. The purpose and standard of this documentation is described in clause 10.2 of the agreement:

"The Service Provider must ensure that it and, where appropriate, all of its Subcontractors maintain such records and documentation to a standard and containing sufficient detail to allow an experienced information technology service provider to use the Deliverables and to perform the Services or any similar services in the event the Service Provider ceases to do so in whole or in part".

The documentation described is required in case the allocation agent and their knowledgeable personnel become unable to continue delivering the allocation agent service. The documentation must be of adequate completeness and quality that others may pick up if necessary the obligations of the allocation agent as seamlessly as possible.

Each document requirement is described and evaluated below.

Allocation User and Administrator Guide

The requirement for the allocation user and administrator guide is described in clause 1.11 (a) of schedule 1 of the service provider agreement, as a guide for allocation participants and the Gas Industry Company to interacting with the allocation agent and its systems.

The document history indicates the guide was reviewed and updated in November 2010, the current copy examined in this audit was updated in May 2011.

The document provides a brief background to the gas allocation process along with instructions for the required interaction with the web site (the major activity performed by participants).

The content of the document is up to date and all internet references worked correctly.

We rate this section as:

4	Good	Adequate to comply with the requirements under all reasonable circumstances.

Technical Specification of allocation system

The requirement for the technical specifications is described in clause 1.11 (b) of schedule 1 of the service provider agreement. This document exists as the functional specification of the allocation system software and in the form of a technical Wiki document describing the software implementation of the functional specification.

The functional specification document revision history indicated the last update was performed in May 2009. Two documents were provided in addition to, and separate from the functional specification;

a. An update of GAU070 as a result of exemption DR09-08-T dated 2009.

b. A new process GAU085 produced as a result of exemption DR09-08-T dated 2009.

The content of the functional specification is very good, however in our opinion it is short on overview information that is necessary to put the technical detail into context. (Compare with the electricity reconciliation system functional specification). With this addition the functional specification would better meet the requirements of the service level agreement which is to facilitate the implementation of the service by others in a disaster recovery situation.

Few significant changes have been made to the system that would require updating of the functional specification, however clearly the document has not been reviewed and updated as required. The document should have corrected updated information incorporated and should also receive a technical review for continued relevance and accuracy as soon as is practical.

We rate this section as:

3	Adequate	Adequate to comply with the requirements most of the time.

Training Materials

The requirement for training materials is described in clause 1.11 (c) of schedule 1 of the service provider agreement. This requirement refers to paragraph 1.2 of the schedule which relates to establishment services and therefore may not be considered relevant, however clause 1.12 of the service provider agreement requires maintenance of the documents listed including the training materials.

We are advised that the training materials exist in the form of the above mentioned Allocation User and Administrator Guide and the Functional Specification. Given that allocation participants know the gas business and the functionality of the web site is well presented and quite simple we consider this documentation adequate.

4	Good	Adequate to comply with the requirements under all reasonable circumstances.

Service Provider Disaster Recovery Plan

The requirement for a service provider disaster recovery document is described in 1.11 (d) of schedule 1 of the service provider agreement.

Service Provider Disaster Recovery Plan – a copy of the disaster recovery plan, which (without limitation) sets out the processes in place to be followed by the Service Provider in the event of the occurrence of a disaster, both to minimise its impact and to recover any lost data and restore the Allocation System as quickly as possible.

There are three elements to disaster recovery as required for the gas allocation processes.

1. Recovery of lost or corrupt data.
2. Replication of working dataset at a remote standby site, and failover to that standby site.
3. Business recovery planning for implementation of service delivery following a disaster.

Recovery of lost or corrupt data

This function (and relevant documentation) is examined in section 6.2 of this report.

Replication and standby site

A computer system recovery guide as produced by M-Co was provided and reviewed. This guide describes item 2 above, the replication of a working dataset at a remote standby site and the failover to that standby site.

The testing performed is of the replication and failover. Tests have been performed every 12 months as required, the latest being completed on 24 May 2011. The test results indicate conformity with the plan which is to implement failover to the standby site.

Business recovery

Business recovery planning (the provision of suitable staff and facilities in the case of a disaster such as the Christchurch earthquake) is not considered part of this agreement by NZX and none exists.

Conclusion

In terms of the replication and standby site we rate the documentation provided as;

4	Good	Adequate to comply with the requirements under all reasonable circumstances.

Given the national importance of the allocation agent service we consider the level of disaster planning presented for audit to be inadequate in that it is focused purely on recovering from IT data events and makes no provision for the continuance of the allocation agent function following disasters.

We acknowledge that the service provider agreement is not specific in this regard and recommend an urgent review of the situation by the industry body.

In terms of business continuity planning we rate the documentation provided as;

1	Very poor	Significantly inadequate noting that the obligation on the Allocation Agent is not contractually clear and requires review.

3.6 Updating the required documentation

Clause 1.12 of the service provider agreement requires that the documentation be updated no less frequently than annually. During the initial stages of this audit we observed the latest update to any documentation was in 2009, with some documentation having clearly out of date material, and other documentation having material waiting to be included.

During the extension to the production of this audit report significant advances were made in updating much of the required documentation, there are as noted still some outstanding issues which we expect will be addressed prior to the next audit.

We rate updating documentation as:

3	Adequate	Adequate to comply with the requirements most of the time.

3.7 Managing exemptions

The rules provide that the industry body may exempt participants from any part of the rules and the service provider agreement schedule 1 clause 1.5 (c) requires the allocation agent perform tasks necessary to give effect to those exemptions.

The industry body asked us to examine the measures taken by the allocation agent to give effect to current exemptions and to evaluate their ability to continue this in the future.

The current exemptions were examined and 5 were identified as requiring some action by the allocation agent.

DR10-02 and DR10-03 Direct connect gas gates

Both of these exemptions relate to gas gates that supply single customers directly connected to the gas transmission system. These gates are therefore exempt from participation in the downstream allocation process and no quantities of gas are to be allocated to any retailer.

The vector OATIS system provides a single file containing injection quantities for all gas gates including the direct connected gates identified as exempt. Functionality built into the allocation software allows operator specification of any gate as exempted from allocation and publication.

To give effect to such an exemption the analyst selects the required gate and selects the appropriate function which is equipped with a date range so changes may be made over time while preserving revision of earlier allocations.

From our overview testing of the performance of the allocation system (reported in section 5 of this report) we conclude the allocation agent has adequately given effect to these exemptions.

DR10-04 Global 1 month UFG methodology

This exemption allows participants to submit TOU metered consumption to a group 3 profile (STOU).

To give effect to this exemption the allocation agent created the profile STOU with its custom processing software. The retailers then simply submit consumption files for this profile ad they are appropriately processed. The allocation analyst performs a manual check that each known retailer has submitted a file against this profile.

From our observations we conclude the allocation agent has adequately given effect to this exemption.

DR10-07 Exempts unmetered gates

This exemption provides a list of unmetered gas gates where the transmission provider is not required to submit consumption information.

Functionality built into the allocation software allows the analyst to select unmetered for any gate, in which case the special processing software takes over and uses the retailer provided consumption as a surrogate for injection information.

We note that in all such cases an expected error occurs when the reconciled information is returned to the OATIS system because the reconciled quantity does not match that posted in OATIS by Vector.

The analyst has a checklist of all unmetered gates in the system and manually confirms the correct gates are processed as unmetered. From our observations we conclude the allocation agent has adequately given effect to this exemption.

DR10-12 Greater Hamilton UFG decision

The allocation agent is instructed in this exemption to recalculate the annual UFG factor applicable to the greater Hamilton gas gate from 1 October 2010, and to apply the recalculated value until 1 October 2011.

Corrected information was loaded into the allocation software and the software used to recalculate the annual UFG for the gate. This value was then applied and will be replaced by the automated system on 1 October 2011.

Some issues arose as a result of the updating of this UFG factor, however we conclude the issues described arose from processing that was compliant with the functional specification but unexpected by the industry body.

We conclude that the allocation agent has adequately given effect to this exemption, however a broader knowledge of the processes and improved communication with the industry body regarding the potential effects of such a change could have prevented the issues arising.

Conclusions

The process of the allocation agent giving effect to exemptions will either be a manual intervention, allocation software configuration or a change to the allocation software.

The above exemptions required allocation software configuration with the exception of the Hamilton gas gate UFG adjustment which was a manual intervention. These exemptions were largely well supported by the allocation agent however we note none required software change intervention.

The ability for the allocation agent to give effect to future exemptions depends on the ability of allocation agent personnel and providing the relevant requirements of the service provider agreement are complied with there should be no problems.

We rate this section :

4	Good	Adequate to comply with the requirements under all reasonable circumstances.

4. Service Management

4.1 Service management methodology

Clause 2.13 of schedule 1 of the service provider agreement states " the service provider should employ industry service methodologies such as Information Technology Infrastructure Library (ITIL) ..."

The previous allocation agent operated such a service methodology for the gas allocation contract. At the time of our initial audit site visit NZX had some ITIL functionality within their information technology group, however this did not extend to the NZX Energy Management team and the service management functions being provided under the gas allocation agent contract.

Following the initial audit site visit NZX Energy implemented ITIL methodologies into the NZX Energy team and the gas allocation agent contract. The implementation included the service management tool previously operated by the NZX IT group along with appropriate processes and procedures to capture service related information and facilitate appropriate responses including escalation of service incidents if necessary.

During the second site visit we observed this process working and could readily identify issues that had arisen along with the current status and actions undertaken.

We rate this section as:

4	Good	Adequate to comply with the requirements under all reasonable circumstances.

4.2 Help Desk

Clause 1.10 of schedule 1 of the service provider agreement requires that the allocation agent provide a help desk to respond to faults and problems encountered by allocation participants.

The help desk is implemented in the form of a telephone number and an email address generally responded to by the lead analyst. At the time of the first site visit an incident recording system was not in place, this was implemented soon after this visit as part of the ITIL initiative described in section 4.1 above.

The industry body asked us to examine the help desk log of calls and to comment on any recurring themes or other matters that could be addressed. During the second site visit the log of calls available since implementation of the help desk recording process was examined and no matters were identified that we consider require further attention.

We rate the performance of this function as:

4	Good	Adequate to comply with the requirements under all reasonable circumstances.

4.3 Logs of user interactions

Clause 2.7 of schedule 3 of the service provider agreement requires that "the allocation system must provide logs of user interactions with the system and include alerts of repeated unsuccessful logons".

Records of user logins are incorporated in computer system logs along with thousands of other system events, these are not monitored or reported on.

While the service provider agreement requires monitoring of these events, this is not a normal activity for computer system managers because computer users generally take responsibility for their own login usernames and passwords.

Monitoring of computer system performance as is now provided by NZX will identify system related issues that would prevent users logging in, and the provision of a responsive help desk is an appropriate mechanism for responding to and resolving issues with user login accounts.

We therefore rate this function as:

4	Good	Adequate to comply with the requirements under all reasonable circumstances.

4.4 Performance standards

Rule 11 requires establishment of a set of agreed performance standards against which the allocation agents performance must be reported and measured at the end of each year. The performance standards are listed in schedule 3 of the service provider agreement.

Rule 11 applies to self reporting by the allocation agent, and in addition, rule 14 provides that the industry body may also review the manner in which the allocation agent has performed its duties.

Self reporting

As required to date two allocation agent annual reports have been provided. We review these reports under the required headings found in schedule 3 of the service provider agreement.

Help desk response times

Are not mentioned

Allocation system performance

In both reports the allocation system availability performance standard is stated as achieved, however we note there is no measure in place or any record available to us that might indicate and allow us to quantify system availability.

Our initial investigations revealed that allocation system performance was sub standard. Performance has since been improved and satisfactory performance reporting is now presented in monthly reports.

Operations performance, timeliness

Known breaches of report delivery timing are identified. Based on our investigation of incidents as required by the industry body we consider these incidents to be inadequately described and generally understated, although we do note that none have been identified as having had a material impact on any participant or the market.

Management reporting requirements

Incident, monthly and annual reports have been provided as required and on time.

Observations

No means has historically been identified by which these performance standards have been measured, however through the implementation of the ITIL service methodology NZX are working to remedy this. There remains considerable scope for improving reporting by providing information from which report recipients may determine computer and service provider performance.

Conclusions

The introduction of the ITIL service methodology with improved reporting tools is contributing positively to the reporting objectives.

Overall we rate the performance of this function as:

3	Adequate	Adequate to comply with the requirements most of the time.

4.5 Monthly performance monitoring and reporting (rules 12 and 13)

Rule 12 requires that the allocation agent perform a self review on a monthly basis. Rule 13 requires provision of a written report on the results of the review to the industry body. The focus of the review and the minimum content of the report is prescribed by the rules.

The allocation agent provided all monthly reports produced since September 2008. A sample of these was examined for compliance.

We confirm that the monthly reports address the matters required by rule 13.2 and the industry body advise all matters requested by them (rule 13.2.3) are adequately addressed. We are advised by the industry body that the allocation agent have been very responsive to requests for additional information and have added elements to the report as requested.

We note the reports are very light on proposals to improve the system or process and recommendations for rule changes. The reports provided of incidents lack detail as to why each incident occurred and what has or might be done to prevent reoccurrence.

Conclusion

We rate the performance of this function as:

3	Adequate	Adequate to comply with the requirements most of the time.

4.6 Incident reporting

The service provider agreement clause 1.13 requires the allocation agent report any breaches of the rules by any participant within 5 business days of awareness and any breach by the allocation agent within 2 business days of awareness.

These incidents as identified by the allocation agent are reported to the industry body and further reported in monthly reports. We rate the performance of this function as:

4	Good	Adequate to comply with the requirements under all reasonable circumstances.

4.7 Measures taken in response to identified issues

The industry body identified a list of specific incidents occurring over the past 3 years and asked us to evaluate the allocation agents response and to identify the measures taken to correct the situation and prevent reoccurrence. These incidents are identified and discussed in the following paragraphs.

December 2008 (breach 2008-18)

M-co emailed a report to a participant, the email was generated by accidentally applying the email command reply / all to a previously received email and consequently the report was also sent to parties who should not have received it.

The primary cause of this breach was that a file was emailed rather than being delivered via the web portal. The secondary cause was simply human error.

We observed a high awareness of this matter and note that its importance and the need to preserve confidentiality is highlighted in the analysts operational procedure documentation.

There have been no further incidents identified and we conclude the measures taken by the allocation agent to prevent reoccurrence have been successful.

December 2008 (breach 2008-19)

Problems were encountered uploading the allocation result files back to the transmission provider system operated by Vector Transmission (OATIS). Adjustments were made to the allocation agent software to correct the issue, however final delivery of the required information was outside the time limit required by the rules and allegedly caused upstream issues for Vector.

This breach occurred soon after the commencement of gas allocation and resulted from software issues that had not previously emerged. The software issues were fixed, however this could not be achieved in time to comply with the rules.

The market administrator declined to pursue this rule breach because of its insignificant impact and we note that no further instances of this breach have been reported indicating a successful resolution by the allocation agent.

March 2009

The allocation agent advised in their March 2009 monthly report that they had implemented:

- Improved sanity checking of the monthly allocation results prior to publication, and
- a new check has been implemented to capture any TOU data submitted as estimates.

We remain unclear as to how these changes were prompted, they are apparently actions the allocation agent has taken to improve service delivery rather than matters arising from reported incidents requiring investigation.

Over time there have been changes to the manual spreadsheet based checking procedures and the check list that accompanies each allocation processing run. These reported items are a small part of that development.

May 2009

A participant identified during May 2009 that the rolling annual aggregation report (GAR030) provided to participants was being calculated with an incorrect aggregation level (too detailed)

and revised consumption provided for interim and final allocations was not being captured into the report.

The resolution of this issue is recorded as a request for change and identifies that the report extraction query was corrected and that all previously generated reports were reproduced.

Having implemented the fix in the allocation software, no further reoccurrences of this incident have been reported.

March 2010 (breach 2010-95)

The allocation agent self reported a breach in that they had published an allocation run (for February 2009) without using the latest revision of injection information.

The later revision of injection information had been provided by Vector, the file was downloaded by the analyst but was not allowed through the gate between the information gathering and verifying software, and the database. Consequently the allocation run used the best available data being the previous revision.

This was operator (analyst) error and has been highlighted in the operator procedure documentation. We note this was caused by the operator having to manually allow files through "the gate' and that the potential exists for further occurrences. We recommend a review of operation of "the gate'.

May 2010 (breach 2010-162)

This is a repeat of the march 2010 incident where an allocation run was performed without allowing the latest version of received information through the gate. It was operator error and the potential for further occurrences remains. This issue relates to use of "the gate" and we recommend a review of this procedure.

January 2011 (breach 2011-17)

Anomalies were noted in the results for the interim allocation of September 2010, resolving these errors caused delayed delivery of final reports.

We are advised the apparent anomalies arose within the allocation software due to unforeseen effects caused by the previous republication of annual unaccounted for gas figures (AUFG) for the greater Hamilton gas gate.

The software was corrected and the reports were rerun and re published. Operator procedures were altered to include checks for duplicate AUFG factors which would be an indicator of the problem reoccurring. No reoccurrence of this incident has since been recorded .

February 2011

Seasonal adjustment daily shape values (SADSV) for the November 2010 interim allocation run published by the allocation run were identified as incorrect.

Previously, a special allocation run (following the initial allocation of November 2010) had been requested by the industry body and run by the allocation agent.

When the interim run was performed it processed as designed and incorporated the results of the latest run (being the special run requested) to contribute to the SADSV calculation. It transpired that it was necessary to pick up the SADSV calculation inputs from the initial run, and the resolution was for the allocation agent to restore the SADSV figures from the initial run.

This issue has arisen because of manual intervention in the designed process. This situation can be expected to arise again whenever adjustments are made to the normal processing, the only solution for this type of incident (which can arise in many guises) is for allocation agent staff to be very familiar with the details of the system processes, and to ensure clear understanding of the requirements of their customer.

June 2011

During this audit we were asked by the industry body to add a further item to our audit investigation.

During an audit of a retailer another auditor has reported to the industry body anomalies observed by them between retailer submitted consumption and billed verses consumption reporting by the allocation agent.

The report concerned provides a comparison of participant as billed quantities against submitted quantities for a trailing 12 months period. Anomalies were identified in the report that required explanation.

On investigation we found the anomalies arose when a late submission of consumption data from the retailer was held back at the allocation system gate, while a consequent system generated zero out file (zeroing out the previously submitted quantities) was inadvertently allowed through the gate.

This resulted in allocation processing being performed on a zero consumption for the retailer concerned, and the consequent anomalies appearing in the comparison file. We note that this would also have resulted in the outstanding quantity being allocated to all retailers as UFE. The error occurred in an interim allocation and was corrected in the final allocation after the files were allowed through the gate.

Again “the gate” (or more correctly operation of the gate) is identified as causing problems. In this instant we are advised the gate operation has been changed to ensure the zero out file will be held at the gate, and operator check lists have again been updated.

We conclude that operation of the gate is at the heart of many issues arising and recommend it be reviewed.

Conclusion

From our analysis of the above incidents we conclude that the process of gas allocation, while simple in principle is complex in practice. No significant software changes have been undertaken by NZX and the majority of issues arise from human error or human inexperience.

The operation of “the gate” (a manually operated software mechanism that controls which files are accepted into the system when) is at the heart of many reported incidents and has given rise to several identified issues. The solution to date has revolved around operator training and check lists which has had mixed success. We recommend a review of this operating regime which is further discussed in section 7 of this report.

Communication of the issues has in the past been poor. We note at the conclusion of this audit that NZX now have staff (and training processes) in place whom we believe are better equipped to explain these matters to participants and the Industry Body.

We rate the current ability of NZX in responding to issues arising as:

4	Good	Adequate to comply with the requirements under all reasonable circumstances.

4.8 Annual performance review

The service provider agreement clause 1.13 requires that the allocation agent provide an annual performance review report at the end of each financial year. The content of the report is prescribed by the service provider agreement under the following headings.

Three annual reports are available. All were overviewed and the October 2009 – September 2010 report was examined in detail against the relevant performance standards published in the service provider agreement schedule 3:

1. **Assessment of performance against standards**
   - **Helpdesk:** Not reported
   - **Allocation system:** Is reported in the required detail.
   - **Ongoing operations performance:** Is reported in the required detail..
   - **Management reporting:** Is reported in the required detail.
2. **Summary of key activities**

   A good summary of key activities is provided.
3. **List of extraneous costs**

   These are reported.

Suggested amendments

No amendments have been proposed to the performance standards, some changes have been proposed to the rules.

Conclusion

With the exception of reporting the required help desk performance standards all requirements are met. We therefore rate the performance of this function as:

3	Adequate	Adequate to comply with the requirements most of the time.

4.9 Change and upgrade management

Schedule 7 of the service provider agreement describes the change control process to be used by both parties when bringing about any change to the services, specifications or deliverables that cannot be accommodated by another process in the agreement, or any new deliverables or services.

Some performance improvement software changes had been made in the past along with a small number of minor functional software changes. None of these were performed using the change management procedure required by the service provider agreement.

Following the initial site visit NZX implemented an ITIL service management methodology across both the IT and Energy Operations groups for the gas allocation contract. This methodology has included the change management procedure required by the service provider agreement.

We have observed three change requests using this change management process since and are satisfied the process used now meets the requirements of the service provider agreement.

The industry body has asked us to comment on the ability of the allocation agent service provider to implement changes to information exchange file formats as required by rule 25.

Modification of these formats, or creation of new formats and adding them to the allocation system software is quite straightforward and would be conducted as a system change under

the change control process. NZX has good software development resources and the relevant software functionality is well described in the technical Wiki.

We rate the ability to deliver software changes as:

4	Good	Adequate to comply with the requirements under all reasonable circumstances.

4.10 Relationship management

Clause 5.3 of the service provider agreement requires provision of relationship managers.

The industry body note that the turnover of relationship manager is high, there have been 3 different relationship managers in the past 2.5 years.

Clause 6 of the service provider agreement describes relationship management responsibilities. Clause 6.4 defines expected levels of responsiveness. The industry body advise us that responsiveness is very good and no notices of inadequate responsiveness have been issued under clause 6.5.

We therefore rate the performance of this function as:

4	Good	Adequate to comply with the requirements under all reasonable circumstances.

4.11 Ensure specified system capacity

Clause 2.3 of schedule 2 of the service provider agreement stipulates the maintenance of system capacity. The measure identified for system capacity is 50 concurrent users, 200 gas gates, 250,000 ICPs and 15 separate retailers. The only performance standard associated with this requirement is completion of reports within the time required by the rules.

The specification of required system capacity falls short in that it does not specify performance (response times) required at the rated capacity. It may be possible to have 50 participants logged on to the system, but response times for those participants may have degraded to the point the system is effectively unusable.

Prior to and during the first site visit we found that logging into the web portal and performing tasks was very difficult due to the long delays we experienced receiving responses to our commands from the computer system. Over the following few weeks NZX implemented fixes for the performance issues identified and also implemented server response time monitoring which is now presented in monthly reports to the Industry Body. Reporting of allocation run timing is also proposed which will further indicate system health.

We are confident this reporting along with the renewed emphasis on help desk response will ensure system capacity is proactively retained in the future and therefore rate performance of this function as:

4	Good	Adequate to comply with the requirements under all reasonable circumstances.

4.12 Robustness of systems

Performance issues associated with the web portal server are discussed in section 3.3 of this audit report, this relates to management of the systems not system robustness. The core software and operating system is robust and the database platform (Oracle) is very robust and performing well.

On the basis of our observations of the core allocation processing we rate the performance of this function as:

4	Good	Adequate to comply with the requirements under all reasonable circumstances.

5. Allocation Process

5.1 Upstream processes

It is useful to understand the upstream allocation process when examining the allocation agent processes.

Gas is sold by producers to customers under undisclosed contracts. Those customers include gas retailers who participate in the retail gas market along with other customers who do not participate in the retail gas market.

The transmission provider Vector conveys gas to wholesale supply points known as gas gates. Some gas gates supply gas retailers and other gates supply customers who do not participate in the retail gas market.

Vector are responsible for allocation and settlement of gas purchases at ALL gas gates, while the downstream allocation system (the subject of this audit) allocates gas only to gates at which retailers purchase gas.

The upstream allocation metering system that interacts with the downstream allocation system (OATIS) contains metering information for all gas gates but does not know which retailers trade at each gas gate. This information is provided separately to the downstream allocation system as reference information.

The OATIS system determines how much gas has been sold at each gate, the downstream allocation process determines the proportion of that gas that is allocated to each retailer at gas gates that supply retailers.

5.2 Overview of systems and processes

The gas allocation agent function was established by The Market Place Company (M-Co) in September 2008 and following the sale of M-co was transferred to NZX in June 2009.

Along with gas allocation, NZX acquired other contract obligations including electricity market allocation (reconciliation) and settlement, and some electricity distributor billing. These functions essentially utilise the same systems and processes as for gas allocation.

Process overview

The purpose of the allocation system is to determine the quantity of gas each retailer has purchased at each market supply point (gas gate). As quantities of gas delivered at the gate cannot be directly identified by retailer, it must be derived and allocated using the measured quantities of gas consumed by each end customer as measured and reported by each retailer.

The allocation process receives the metered quantities of gas that is injected at each wholesale gas supply point (gas gate), and it receives end consumer consumption derived from consumer premise metering and supplied by retailers.

All quantities of gas supplied through retail gas gates is allocated to retailers, either by retailer submission or by allocation of unaccounted for gas (UFG). The allocation process must resolve discrepancies between quantities injected at gas gates and quantities reported by retailers.

Systems overview

Hardware and database

The processing hardware is owned and operated by NZX as part of the service agreement with the industry body. Duplicated hardware and databases are operated with the production equipment located in Auckland and the secondary standby equipment located in Wellington.

The equipment is housed in a commercial facility designed for the purpose and operated by a Telecom New Zealand subsidiary company. This arrangement is purely for housing the equipment in a suitably controlled and protected environment, all maintenance including upgrades and data recovery remain the responsibility of NZX.

At each site separate computers are used for the web server and the database server functions, and firewalls protect both the web server and the database server from internet incursion.

The normal operational site is Auckland and the data replication system continuously transmits blocks of information describing database transactions to the Wellington site where it is applied to the Wellington database.

A time lag exists while transaction information is transferred from the primary site to the secondary site meaning a short delay is experienced before the secondary database can be fully synchronised with the primary database. A typical worst case delay before a transaction fully updates on the secondary database is a small number of minutes but could be up to 30 minutes during a busy period.

Should the equipment at the primary site fail, full functionality can be delivered very quickly out of the standby site. Failover to the standby site is manually controlled and must wait until all replication files have been transferred.

Software

The allocation software architecture incorporates a highly functional web based operator interface. All software processes have operator screens that very clearly identify the process running, the percentage completed and the presence or otherwise of errors. Further information about sub sections of each process (details of sub processes, process completion, errors etc) are accessed by clicking on the screen.

All allocation functions are performed automatically within the allocation software which also performs a number of checks as it processes.

Very detailed process logging can be turned on for debugging purposes, this does not normally run as it severely impacts computer performance and process run times[5]. All processes can be backed out and rerun as many times as required until all warning and error messages are either resolved or fully understood.

5.3 Data transfers

Audit trails

The service provider agreement section 2.10 requires full audit trails for all file transfers. The allocation system web portal is designed for transfer of files to and from participants and provides the required audit trails.

We initially noted that due to performance issues files were always emailed to Vector Transmission and sometimes emailed to other participants. We advised NZX that emailed files

[5] Would typically be invoked n the test environment where it would have no operational impact.

do not provides the audit trail intended and over the course of the audit the performance problems were resolved and files are now being provided to Vector Transmission and all participants via the web portal process.

Following re establishment of web portal transfers we rate the performance of this function as:

4	Good	Adequate to comply with the requirements under all reasonable circumstances.

5.4 Receive Consumption information (rules 31, 32 and 33)

Overview

Retailers provide consumption information to the allocation agent by logging into the allocation system web site. The retailer selects the files to upload on their computer and initiates the upload process which then transfers the selected file(s) to the allocation agent web portal and logs the event.

At the time the files are transferred to the allocation agent, file format checks are performed and any files failing the checks are rejected with an error message to the sending retailer who must then correct the file and load it again.

Submission files that pass the validation tests are then automatically placed into the information gathering system and identified as ready for transfer to the allocation database. The transfer into the allocation database is performed automatically by the computer, however it is only initiated when the analyst confirms to the computer it has appropriate files to transfer. This is performed by opening “the gate” which is the subject of some discussion in this audit report.

The waiting files are observed by the analyst which we are advised serves as a check that only expected files are being transferred into the allocation database.

Checks performed

The allocation software has inbuilt functionality to check the loaded consumption data for completeness prior to running the allocation process. These checks are initiated by analyst menu selection.

Two checks are identified. Firstly the system checks that for every retailer submission there is a submission (trading) notice for the retailer at the relevant gas gate, and secondly the consumption volumes submitted by retailer and allocation group are compared to the previous months volumes, and discrepancies are flagged for analyst attention.

Observations

The receiving of consumption submission files was observed for the May interim allocation run, however typically the above checks are not performed for interim or final runs because the system has inadequate knowledge of what to expect.

Checks for complete information are performed for interim and final allocation runs after the allocation processing. These checks compare interim or final results with the previous run and hopefully pick up any major discrepancies. Again this is not a certain process and is open to interpretation of the results and human error.

We consider that significant risks arise with the checking of the delivery of consumption information, these arise because the computer system is not made aware of which submissions it expects and cannot report missing or incorrect submissions.

This issue is further discussed in section 7 of this report where recommendations are made for integration of registry information that could bring greater certainty to the checking of input information.

3	Adequate	Adequate to comply with the requirements most of the time.

5.5 Receive retailer gas gate trading information (rule 39)

Gas gate information is provided by retailers to the allocation agent using a form available on the public section of the allocation agent web site. The form has excellent instructions describing the information retailers must provide under rule 39.

When received by the allocation agent this information is manually updated by the analyst in the allocation system. We consider this process satisfactory as very few changes occur to retailer gas gate trading information.

5.6 Receive retailer reports (rule 40)

Rule 40 requires that when providing consumption information retailers must also provide additional information.

Proportion of historical estimates

The proportion of historic estimates contained within the consumption information is provided within the consumption information files and is received into the allocation system. This information is used by the allocation agent to report to the industry body. see GAS080 (receive meter reading frequencies), GAR 100 (report of meter reading frequencies) and GAR110 (report percentage of historical estimates).

We confirm that proportion of historic estimates is being provided by retailers and is being reported by the allocation system in the appropriate files.

We confirm that the percentage of validated meter readings is being reported by the allocation system as required.

4	Good	Adequate to comply with the requirements under all reasonable circumstances.

5.7 Receive transmission injection information (rule 41)

Overview

Vector Transmission provide metering information for all metered gates on the network. The information is placed by Vector on the Vector Open Access Transmission System (OATIS)[6] and NZX download a zipped file containing all the provided information.

[6] Vector is the only supplier of injection information to the allocation process.

The downloaded zip file is identified by the analyst to the allocation system which then automatically extracts all gate injection files, performing file format validity checks during the extraction.

Files that pass the validation tests are then automatically placed into the information gathering system and identified as ready for transfer to the reconciliation system. Any files that fail the file format validation tests are not loaded into the information gathering system and are identified to the analyst on screen as requiring attention.

The transfer into the allocation system is performed automatically by the computer, however it is only initiated when the analyst confirms to the system (by opening "the gate") it has appropriate files to transfer. The waiting files are observed by the analyst which serves as an initial sanity check that only expected files are being transferred.

Transmission injection files are downloaded before each of the initial, interim and final allocation calculations. Between these calculations the transmission metering quantities may or may not be updated, we note there is no information in the file to indicate whether any updates have occurred, however the system is reloaded with information for all gas gates for each revision thus ensuring the most up to date injection information is used for each allocation calculation run.

Checks performed

A number of gas gates are unmetered and information is not provided by the OATIS system for these gates.

Vector Transmission also provide (by default) injected quantities for a number of notional gas gates where the injected quantities for downstream connected gas gates are repeated. The injection files for these notional gas gates are also rejected by the system to prevent doubling up of injected quantities.

Injection information is also provided for some gates where retail trading does not take place. This information is filtered out according to the allocation system static information.

Transmission injection information is supplied by gate and is compared in the allocation system with trading notifications recorded in the system static information identifying which gates are expected to be included in the allocation process. Transmission injection information submitted for gates that do not have a valid injection notification are rejected and an error is notified to the analyst.

An analyst manually checks all rejections according to a checklist and deals with any unexpected rejections.

Observations

The performance of checks of injection information received for interim and final allocations is hampered by the lack of an identifier that information has been updated after the initial allocation run. We consider it unlikely that this will ever have any material impact on allocation results as the allocation agent simply reloads all transmission injection information prior to each allocation revision.

The process of obtaining transmission injection information was observed for an interim allocation. Prior to downloading the file from OATIS the analyst checked with Vector Transmission in case they had any late changes to the files. None were noted and the transmission files were processed with the expected file rejections being noted by the analyst and checked on the checklist.

Excellent information is provided on screen about the processing and any warnings or errors that may arise are clearly identified to the analyst.

It is of some concern that the analyst must accept expected file rejections and notice if any others are present. A more robust process would be for the allocation system to only identify file rejections where it is not expecting that file. It is unclear to us whether or not the allocation

system alerts the analyst to any files that are expected but not received (as indicated by the presence of an injection notification).

We consider it appropriate that a review is conducted of this checking process in conjunction with a review of the operation of "the gate" and integration with the Gas Registry which is discussed in section 7 of this report.

We rate the performance of this function as:

3	Adequate	Adequate to comply with the requirements most of the time.

5.8 Estimate and correct consumption (rule 43 and 44)

Rule 43 requires that the allocation agent estimate consumption or injection information if the retailer or transmission provider fails to provide the consumption information or actual daily energy quantities as required.

To the extent the system knows what consumption or injection information is expected (this is further discussed in section 7 of this report) the system will perform missing information checks and where missing information is identified will prompt the analyst to initiate the estimate process.

The analyst will make a decision based on all available information as to whether an estimate should be performed or not.

If an estimate is to be produced the allocation software uses historical information as described in the GAU020 specification to calculate the missing quantities. In depth testing of the estimation functionality is appropriate for system acceptance testing but is beyond the scope of this audit.

4	Good	Adequate to comply with the requirements under all reasonable circumstances.

5.9 Perform global allocation (rules 45 and 48 to 50)

Overview

Once all the above information is assembled in the allocation database the allocation processing run is initiated and automatically performs the following tasks and creates the resulting reports.

1. Create injection quantities for unmetered gas gates
2. Calculate Monthly UFG.
3. Allocate groups 1 and 2 (TOU).
4. Allocate groups 3 and 5 (deemed profiled).
5. Calculate gate residual profiles.
6. Allocation groups 4 and 6 (residual profiled).
7. Final balancing process ensures all injection is allocated and zero negative UFG results.

Full logging of the status and progress of each stage of processing is provided. Processing errors are identified to the analyst and the process can be rerun as many times as is necessary to identify and correct all the errors.

The complete processing run takes approximately 30 minutes.

Checks performed

Following successful processing of the allocation run a number of checks are performed by the analyst using spreadsheets.

The number of possible exceptions that can arise is too high for full automated programmatic checking of the allocation results[7], it is therefore necessary to have a skilled analyst familiar with the process examine the allocation results for anomalies.

This examination is performed using spreadsheets equipped with macro code to support the checking process. Some spreadsheets directly access the allocation database, while others are loaded with report files produced by the allocation process.

Tests that are performed are:

1. Submissions for the STOU profile code (Time of use meters allocated to a monthly deemed profile) are provided only for expected gas gates and are submitted to allocation group 3.
2. The sum of daily allocations equals the sum of daily injections.
3. Check for negative allocated quantities.
4. Check for ICPs without trading contracts.
5. Identify gas gates (with trading notifications) that have zero or null injection.
6. Check for allocations to injection without trading notification.
7. TOU submissions (allocation groups 1 and 2) are saved to spreadsheet for later sanity checks.
8. Allocation results are uploaded to the Vector OATIS system where the total allocated to each gate is compared with the total metered quantity at that gate. Any failures are advised on the analyst operator screen. Unmetered gates fail because the allocation quantity is derived from retailer submissions and invariably differs from the Vector record. Failures of metered gates are investigated.
9. The UFG graph is updated with the latest calculated UFG values. The graphical display provides a sanity check of the resultant values and is used for reporting to the industry body.

Observation

We have observed the operation of the allocation process and related checking procedures. The programmatic checks built into the allocation software are appropriate as are the extensive checks performed post allocation by the analyst using spreadsheets.

We note that while the automated allocation processing takes approximately 30 minutes for each run, the analyst spends considerably more time examining the results of the run for errors or omissions. These checks are performed with the assistance of the checking spreadsheets.

We rate the performance of this function as:

[7] Practical levels of automated checking are implemented in the allocation software and appropriate warnings or error messages are raised to the analyst at run time.

4	Good	Adequate to comply with the requirements under all reasonable circumstances.

5.10 Calculate UFG factors (rule 46)

Unaccounted for gas (UFG) is the quantity of gas left at any injection gas gate after all reported retailer consumption quantities have been subtracted.

Annual UFG

In the global allocation process UFG calculated according to the annual UFG model is applied to allocation groups 1 and 2 being the time of use metered consumption.

Monthly UFG

In the global allocation process UFG calculated according to the monthly UFG model is applied to allocation groups 3,4,5 and 6. These are the non time of use metered consumption values.

Testing

Detailed confirmation of the UFG calculations would have been undertaken during system acceptance testing or at the time of any materially relevant software change. Such detailed testing is beyond the scope of this audit report, however overall testing of allocation process outputs against inputs has been undertaken and is relevant, refer section 5.16 of this audit report.

We rate the performance of this function as:

4	Good	Adequate to comply with the requirements under all reasonable circumstances.

5.11 Special allocation (rule 51)

The allocation software is designed to perform multiple global allocation calculation runs, each of which recalculates the allocation based on the latest information available in the allocation database.

The scheduled allocations are initial, interim and final, however at any stage a special allocation may be run which simply recalculates the allocation based on the latest information available in the allocation database.

It should be noted that discrete components of the global allocation process such as calculation of the monthly or annual UFG factors will be performed with the latest available input information or results regardless of whether these apply to or are from an initial, interim, final or special allocation run.

Detailed confirmation of this functionality would be undertaken in system acceptance testing or following material relevant software changes, and is beyond the scope of this audit report.

We note that before a special allocation can be performed the information technology staff must enable the special allocation on the analyst screens. We also note that some issues have arisen (section 4.7 of this report) following the performance of special allocation runs.

We rate the performance of this function as:

4	Good	Adequate to comply with the requirements under all reasonable circumstances.

5.12 Annual reconciliation (rule 52)

The annual reconciliation is a monthly comparison of 12 months of retailer submissions against 12 months of as billed information provided by the retailer and is reported by the allocation system in the GAR080 report.

We confirm the allocation system is performing this function. An error with this reporting was identified during the course of this audit, this is reported as the June 2011 issue raised in section 4.7 of this audit report. The matter was an isolated incident and is satisfactorily resolved.

We rate the performance of this function as:

4	Good	Adequate to comply with the requirements under all reasonable circumstances.

5.13 Allocation agent reports (rule 53)

Rule 53 requires the provision of various reports following each allocation. We confirm these reports are provided as required and within the timeframe specified.

5.14 Manage deemed profiles

Three deemed profiles were established at the inception of the allocation system in 2008, there have not been any subsequent changes and no management activity has been required.

5.15 Notice of force majeure event

No such event has occurred in the history of this contract.

The allocation agent appears to be aware of the need to advise of a force majeure event although we have not seen any documentation to that effect.

5.16 Allocation process tests

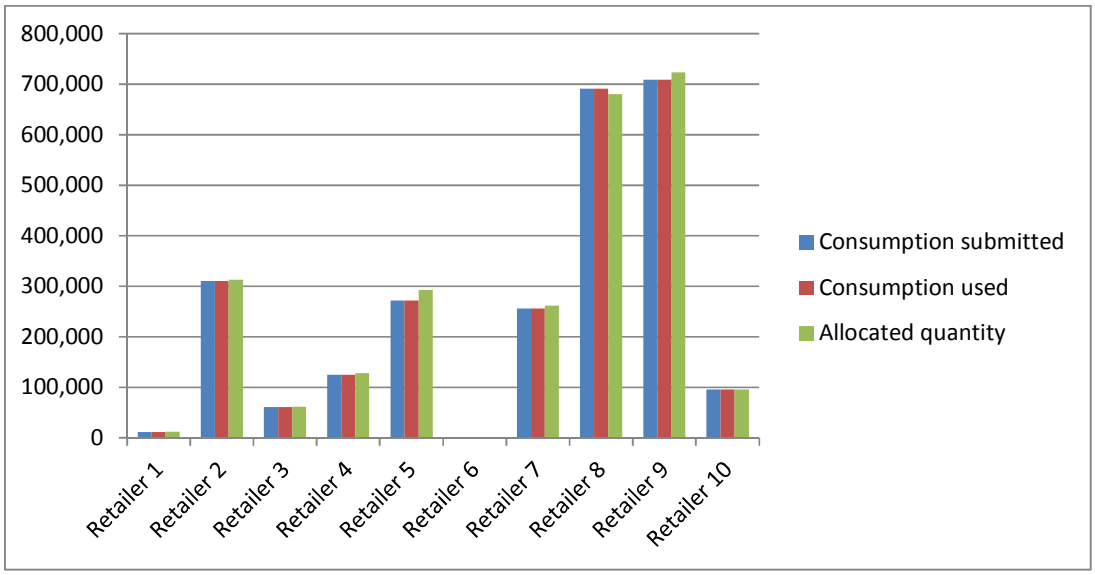
It is appropriate to perform some audit testing of the allocation process, however full functional testing of the individual process calculations is the domain of software testing such as that performed prior to acceptance of the system or following material software changes.

We have established that comprehensive testing was performed prior to initial release of the software and no material changes have been made to core processing since.

For our test we have taken all submission and processing files for the initial processing of the May 2011 consumption month.

Retailer submissions

Retailer submitted quantities were compared with the processed quantities within the allocation system and with the final allocated quantities. The results are shown below.



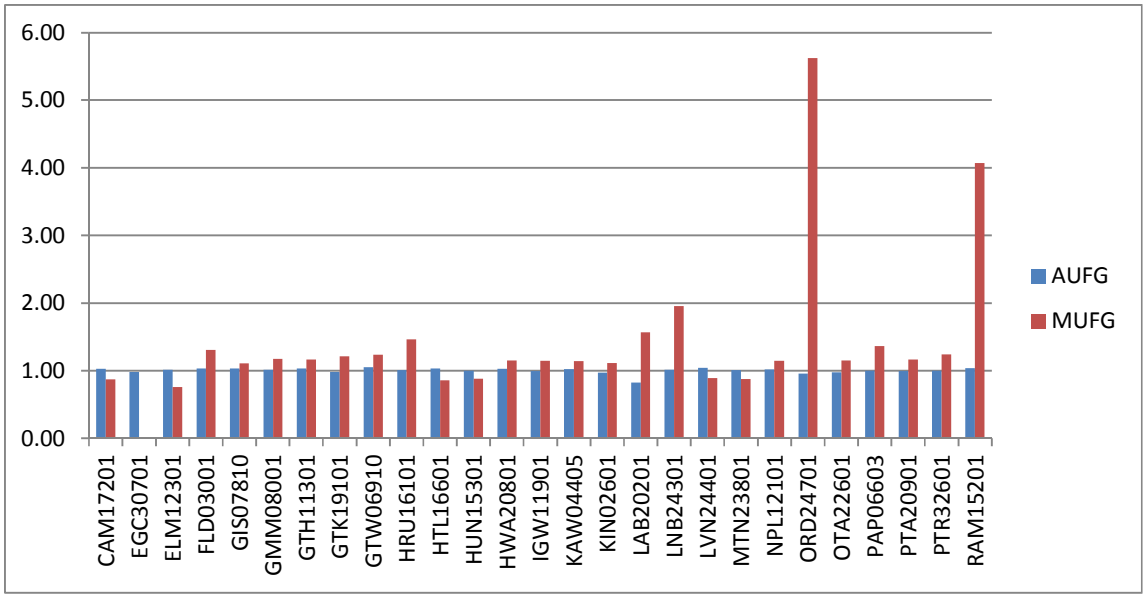
As expected there is a good correlation between the retailer submitted consumption and the quantities processed by the allocation system. Comparing these values with overall allocated quantities demonstrates reasonable quantities of overall UFG.

Injection submissions

Injection quantities were extracted from the Vector Transmission supplied injection files using the best available indication of the allocation system static data. Vector transmission do not provide the allocation system with quantities for unmetered gates. When the allocated quantity for unmetered gates was added to the quantities extracted from the Vector files the injection quantities were within 0.003% of the allocated quantities.

UFG per gate

Calculated UFG factors were examined per gate, the (filtered) results are shown below.



The graph is filtered to only indicate potential anomalies. Filtering eliminates any gates with monthly UFG factors outside the range 0.9 to 1.1 and any gates where the monthly injected quantity falls below 250 GJ[8].

Two anomalies are evident from the graph. As overall UFG is satisfactory these anomalies have not been investigated.

Conclusion

From the tests performed we conclude the allocation system is performing allocation calculations correctly.

We rate the performance of this function as:

4	Good	Adequate to comply with the requirements under all reasonable circumstances.

[8] Small quantities of residual profile allocation causes apparently anomalous MUFG values which are not reported here.

6. Risk Management

Risk management and disaster recovery planning is lightly covered in the service provider agreement and the allocation agent is required to provide a Service Provider Disaster Recovery Plan which is discussed in section 3.5 of this report.

- Main document: 1.11 Documentation
- Schedule 2: 2.12 recoverability and business continuity disaster recovery plan. Talks about recovering the system not about operating the service.

6.1 Risk assessment

Risk assessment information was requested and an assessment spreadsheet was provided which indicates that risk assessment activity has recently been undertaken, however it is incomplete.

We rate the performance of this function as:

2	Poor	Inadequate to comply with the requirements under all reasonable circumstances.

6.2 Maintenance of data environment

The systems and processes that determine data integrity were investigated.

Database management

Data is stored and managed in an Oracle database using the proprietary database management tools supplied. This data management regime is highly appropriate for this application.

We rate the performance of this function as:

4	Good	Adequate to comply with the requirements under all reasonable circumstances.

Data replication

Data replication at a remote site is provided for by the Oracle database tools, it should be noted that data replication and the standby site is not a replacement for data management and backups as it will replicate any corruption that occurs in the primary data.

We rate the performance of this function as:

4	Good	Adequate to comply with the requirements under all reasonable circumstances.

6.3 Data backup and recovery

Data recovery is performed from data backups. We are advised that data backup copies are created at the Auckland site which we have not visited.

We requested a copy of the contract NZX has with the service provider housing the computer systems and providing the data backup and storage services. A contract was viewed which simply states the description of service as;

"Twice weekly service of secure local and linehaul transportation for offsite remote storage of media to Palmerston North".

We have no evidence that satisfactory contractual arrangements are in place for the creation and retention of data backups or for the recovery of data in the event of data corruption.

Based on the audit evidence provided we rate the performance of this function as:

1	Very poor	Significantly inadequate.

6.4 Disaster recovery testing

Disaster recovery is discussed in full in section 3.5 under the heading Service Provider Disaster Recovery Plan.

Testing of replication and standby site.

The disaster recovery testing described in the service provider agreement and performed by NZX is of the replication and failover. Tests have been performed every 12 months as required, the latest being completed on 24 May 2011. The test results indicate conformity with the plan which is to implement failover to the standby site.

We rate the performance of this function as:

4	Good	Adequate to comply with the requirements under all reasonable circumstances.

6.5 Conclusion

As discussed in section 3.5 of this report we consider the technical matters related to disaster recovery are well implemented[9] however a major gap exists in business continuity planning which should be addressed.

As responsibility for this is not clear in the service provider agreement we believe this should be investigated by the Industry Body.

[9] Notwithstanding the inability to demonstrate contractual responsibility for data backups.

7. Identifying information inputs

In several sections of this audit we have identified issues related in some way to the processes of identifying information inputs to the allocation process. Relevant issues are:

- Checking all consumption and injection information is received rule: 30
- Identifying the need for estimation of values rule: 43
- Prevention of issues arising from operation of "the gate" and zero out files.

This section encompasses a general discussion of these issues.

7.1 Consumption submissions.

Some effort is made by the allocation system to check the quality of consumption submissions, this is important because it effects the accuracy of the allocation but also because it can potentially identify errors and rule breaches on the part of submitters.

During the audit we have observed the following:

At present the allocation system checks that each retailer submission for each gate has an applicable trading contract, and also looks to the previous months submissions to determine if possibly a retailer has not made a submission this month.

Contracts to trade are simply identified at a gate, not by allocation group at the gate. The system is therefore not aware of what individual (group) submissions to expect from retailers at any gate.

This process has limited value as customers and trading arrangements move between retailers, and the allocation system is never sure of what to expect, and therefore has limited ability to identify submission errors. When a gate level error is identified, the analyst has to hunt round to determine if it has been caused by retailer error or because contracting arrangements have changed. This is a manual process that is time consuming and subject to normal levels of human error.

The allocation system does not raise an error if a retailer submits information this month that it had not submitted last month. Such a submission could be valid as a result of a contractual change or could be an error, either way the submitted information enters the allocation system for processing. If the retailer decides the submission was erroneous, the retailer MUST submit a **zero value file** to remove the erroneous information from the allocation system otherwise it will continue to be processed.

The gate issue: The gate is kept closed because of uncertainty over what files should be allowed in, particularly as information submitted erroneously has to be zeroed out by the retailer.

This has caused problems[10] through allocation runs being performed with files still behind the gate and the zero out file process not being performed has caused erroneous reporting (and possibly allocation results as well).

[10] See section 4.7 of this audit report.

7.2 Injection submissions

Similar issues arise with transmission injection files which are also manually allowed through the gate. The system would benefit from obtaining static gate information from the registry.

7.3 Discussion

The following is offered as an alternative that would improve the accuracy of submission checking and provide a means of monitoring and auditing retailer submission compliance. It would allow the gate to be kept open (as in the electricity system) and avoid future errors caused by analysts not processing all files.

The input checking process implemented in the allocation system was introduced prior to the existence of a gas registry, and at the time was the best that could be done. Some documentation we have seen suggests the intention was to utilise the registry in the allocation process, this has not occurred.

Now that a registry is available and in use it could be used to determine for each gate which retailer should be submitting which consumption files for which allocation groups each day, and could be a definitive source of gas gate static information for the allocation process.

With this information the allocation system could build a table of expected submission inputs from each retailer and each gate, it could then accept only valid inputs and identify missing submissions with greater accuracy. The issue described above requiring retailer zero out files could be handled within the allocation system and “the gate” could be normally left open (as in the electricity reconciliation system) and closed during processing runs.

This would provide much higher certainty of the input consumption information, provide a readily auditable trail (and reporting if desired) of retailer compliance, and reduce the present reliance on human checking of reported potential submission errors.

With this process in place the gate could be kept open between the information gathering process and the database (as it is for electricity) which would eliminate the future potential for repeats of problems that have arisen.

We recommend further investigation of this option, it is our expectation the benefits would be found to outweigh the cost of implementation.

8. Conclusions

The initial findings of this audit were unsatisfactory in some regards, however we note that no material rule breaches or allocation inaccuracies have been identified and efforts by the NZX Energy team prior to completion of the audit have lifted the audit result to a generally satisfactory level.

The implementation by NZX Energy of the required service management regime (including elements of performance monitoring) during the course of this audit has considerably lifted the audit report results.

We note that many incidents identified are related to supplied injection files, supplied consumption files and operation of “the gate” that allows the files into the system. Our observations suggest the initial intent was that the allocation system would be integrated with the registry, however at the time the allocation system was commissioned the registry had not been built.

A number of uncertainties exist with the validation of these supplied files and the processes are prone to human error, this situation would be significantly improved by integrating the allocation system with the registry.

9. Allocation agent comments

NZX has reviewed and implemented changes to its processes and procedures for the allocation agent role to improve both the quality and robustness of service delivery. Further on-going work will include addressing those areas of poor performance identified by the audit as follows:

Business recovery planning: The service provider agreement defines the scope of business continuity planning to be provided by the allocation agent under Schedule 2, clause 2.12. This does not extend to business recovery planning as defined within the audit report. That said, we would be happy to work with the Gas Industry Company and participants to broaden our business recovery plan, following the service provider change control process.

Data backup and recovery: Working with the Gas Industry Company we will look to better clarify the scope of services described in the contract with our data backup and recovery service provider.

Risk assessment: We understand that the Auditor views our risk assessment for the service provider role as incomplete as it does not clearly identify planned responses to identified risks. This will be reviewed and addressed by January 27 2012.

Signature page.

3 February 2012
P M Troon
Auditor