

Electricity Commission

Clearing manager

Draft

Functional specification

Version 2

July 2006

This document reflects the draft Electricity Governance Rules 2003 (Rules) as at December 2005. Subsequent rule changes and transitional requirements have yet to be included.

Contents

1	INTRODUCTION.....	4
2	RULE REFERENCES	4
3	OVERVIEW	5
4	THIS DOCUMENT	5
5	INFORMATION FLOWS TO AND FROM THE CLEARING MANAGER.....	7
6	INITIAL START-UP REQUIREMENTS.....	8
	DEFINITIONS	9
7	PROCESS MAPS	10
8	SUB-PROCESS:ES	16
8.1	PRODUCTION OF INVOICES.....	16
8.2	MANAGEMENT OF PAYMENTS	42
8.3	MANAGEMENT OF DISPUTES AND DEFAULTS	44
8.4	MANAGEMENT OF PRUDENTIAL REQUIREMENTS	47
8.5	PUBLICATION OF INFORMATION AND PRODUCTION OF REPORTS.....	51
8.6	MAINTENANCE OF REFERENCE DATA.....	58

Revision history

Version	Release date	Description
Draft 1	January 2006	Initial draft version.
Draft 1.1	June 2006	Second draft version—addition of BCTI's.
Draft 2	July 2006	Change to front page and some document formatting.

Clearing and settlement system functional specification

1 Introduction

The responsibilities of the clearing manager role are defined in the Electricity Governance Rules 2003 (Rules). They are to be carried out by a service provider on behalf of the Electricity Commission. The terms and conditions under which service providers are appointed and must act are set out in the Electricity Governance Regulations 2003 (Regulations).

2 Rule references

This document describes the responsibilities and functions of the clearing manager role as described, mainly, in parts H, G and C of the Rules. Part H gives details of the clearing manager's responsibilities, part C section IV specifies the calculations required for ancillary services, and part G specifies the calculations for constrained-on and constrained-off amounts and the clearing manager responsibilities regarding the must-run dispatch auction. However, there are a number of rules in other parts of the Rules that make reference to the clearing manager. These Rules are:

Part E rule 24.1	Defines the responsibility of the registry to provide the clearing manager with retailer trading information.
Part J rules 4 and 9	Defines the responsibilities of the reconciliation manager to provide information to the clearing manager regarding any changes to the grid and reconciliation information pertaining to each reconciliation participant.
Part J rule 10	Defines the revision/wash-up process.
Part J schedule 4 rule 2	Defines the timing of delivery of reconciliation information.

The versions of the Rules used in this document are those that were released on the following dates:

Part C 1 September 2005
Part E 6 December 2005
Part G 7 December 2005
Part H 1 July 2004
Part J 7 December 2005

If there appear to be any conflict between this document and the Rules then the Rules take precedence.

3 Overview

The primary obligation of the clearing manager is to settle the purchases and sales of electricity in New Zealand. As part of this obligation, the clearing manager has a number of responsibilities defined in the Rules, including the following business functions.

1. The production of invoices for the purchase and sale of electricity.
2. The inclusion on invoices for amounts payable and receivable for ancillary services, hedge contracts, losses and constraint excesses, constrained-on compensation, must-run dispatch auction rights, fees and taxes.
3. The management of prudential requirements to ensure that payers can meet their financial obligations.
4. The management of payments from purchasers and to sellers.
5. The management of invoicing disputes and payment defaults.
6. The publication of reports and information to participants and the board.

Many of the business functions performed by the clearing manager require the delivery of information to and from other service providers and participants (*see next section*). The expectation is that the service provider of the clearing manager role will develop communication channels with all the relevant parties for the efficient and timely transfer of information.

4 This document

The clearing and settlement system is required to keep up to date with technological advances to ensure it delivers its functions efficiently and securely to participants. Therefore, this document assumes the service provider will use one or more computer systems to perform most of the business functions required by the clearing manager role.

Some of the process descriptions in this document include data descriptions. These show information content only, not the actual file formats. The clearing manager service provider is expected to agree formats, schedules and transfer mechanisms with each service provider and participant.

The Rules make reference to an 'information system' for the publication or transfer of information to participants. Currently, there are a number of systems that constitute the 'information system' and are owned and operated by a number of service providers and range from bespoke systems to internet websites to standard email. Participants are required to make arrangements with the different service providers for access to specific parts of the 'information system'. Participants need to understand which system provides which items of information. Since some information is published in more than one system, participants have developed their own preferences for inclusion in their own operations. Other than email and voice, the current systems used are:

Rule role (party responsible)	Rule part	IS system
Board	C, D, E, F G	Electricity Commission website Wholesale information and trading system
System operator	C G	Own website Wholesale information and trading system, SQLNet over TCP/IP
Registry	E G	Reconciliation manager's website Registry web application
Generator	G	Own website, Wholesale information and trading system, FTP
Purchaser	G	Own website, Wholesale information and trading system
Grid owner	G	Own website, SQLNet over TCP/IP
Ancillary-service agents	G	Wholesale information and trading system
Embedded generator	G	Wholesale information and trading system, FTP
Pricing manager	G	Wholesale information and trading system
Clearing manager	G, H	Wholesale information and trading system, FTP

5 Information flows to and from the clearing manager

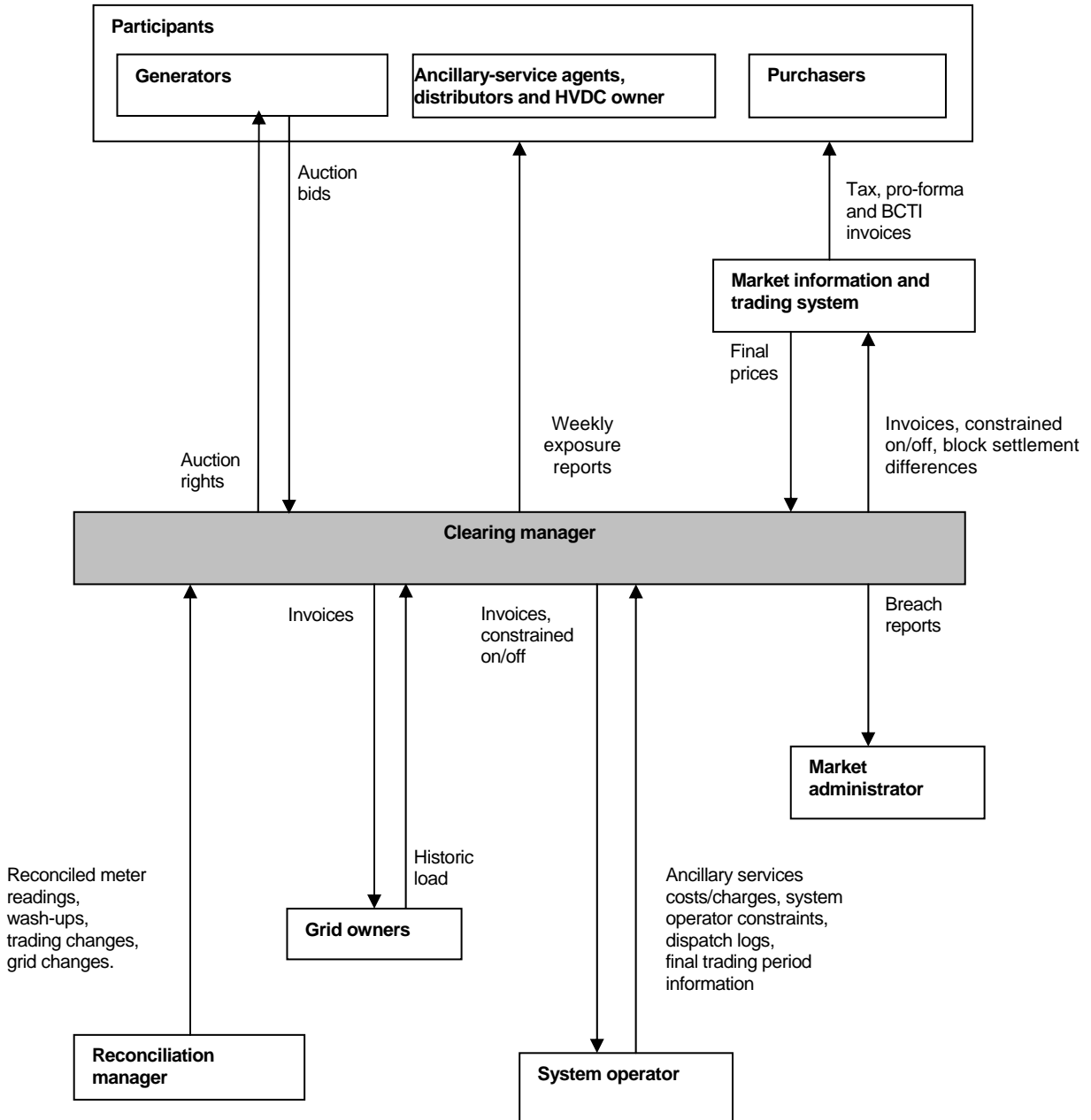


Fig 1. Information flows between the clearing manager, other service providers and participants.

6 Initial start-up requirements

There are a number of initial start-up requirements for the clearing manager role, the most important of which are:

1. The creation of a company, limited by shares, with a constitution limiting its powers as specified in part H rule 14.
2. The establishment of two or more interest-bearing cash deposit accounts for the management of cash deposits held in trust as specified in part H rule 2.6.
3. The establishment of an operating account as specified in part H rules 7.11 and 7.12.
4. The establishment and maintenance of fidelity insurance as specified in the Regulations.
5. GST and resident withholding tax registration with the IRD.

Definitions

Billing period/consumption period

In parts of the Rules, specifically in part J, the term ‘consumption period’ is used but in part H the term ‘billing period’ is used instead. They are equivalent and both mean a period of one calendar month. Because the focus of this document is on clearing and settlement, the term ‘billing period’ will be used throughout this document.

Note: the Rules have attempted to make these terms generic so that in future, if billing changes from a monthly cycle to a weekly or even daily cycle, only the definition in part A would change. Any proposed system would need to be able to change to a new cycle length without any significant disruption.

Reconciliation period

At present, the term ‘reconciliation period’ means the current month. Invoices are produced in the current month for the previous billing period and for any earlier billing periods for which revised reconciliation information has been received (see wash-ups below).

Wash-ups

‘Wash-up’ is the term used by the industry to describe prior billing periods for which revised reconciliation information has been provided to the clearing manager. In the current reconciliation period, reconciliation information will be provided for the previous billing period and revised reconciliation information may be provided for these specific previous billing periods: three months prior, seven months prior and 14 months prior. However, it is possible for revised reconciliation information to be provided 18 months prior and 24 months prior, if the board requires it.

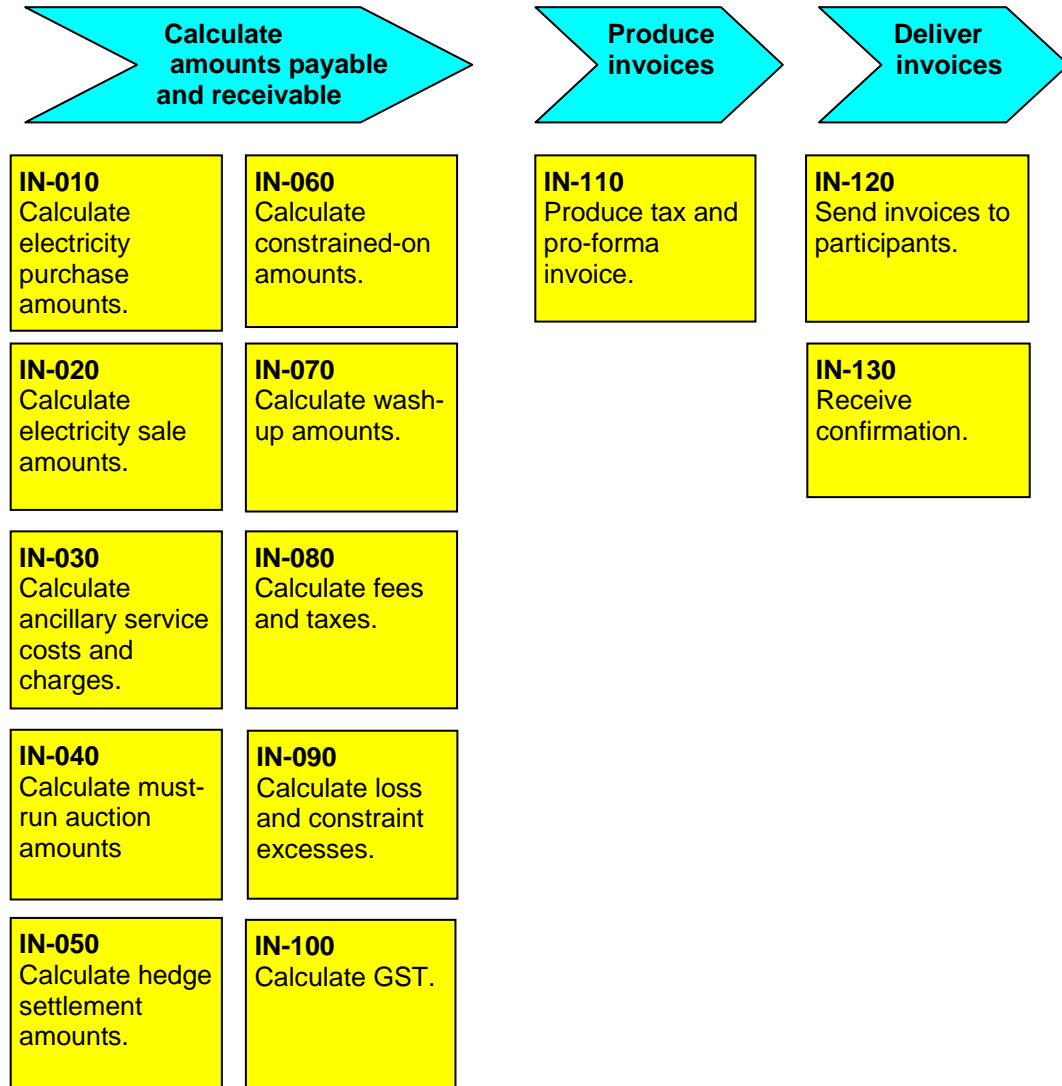
Other revised information can be received for ancillary services. These can be for any prior billing periods of up to 24 months.

Grid points and NSP

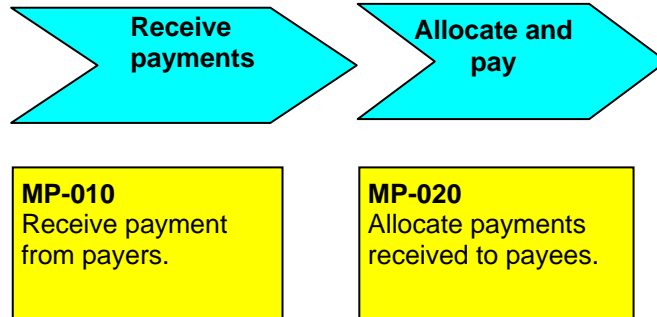
Reconciliation information is provided at the network supply point (NSP) level. This NSP is a two-part field consisting of the grid point (injection or exit)—the connection point on the network at which electricity was injected or extracted—and the network code. The network code indicates the owner of the network that conveyed electricity from the consumer or generator to the grid point. The network code does not have any relevance in any calculations required to be performed by the clearing manager. Final prices are provided at the grid point level not at the NSP level.

7 Process maps

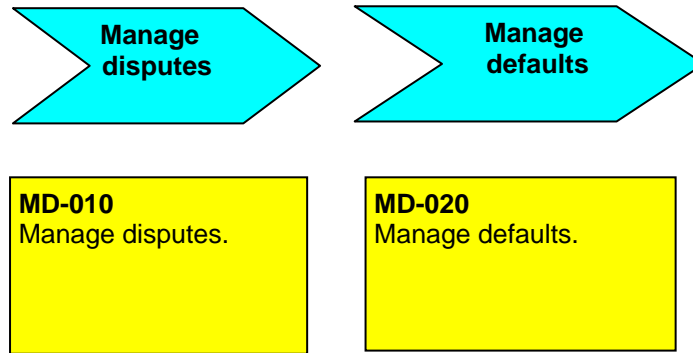
Process map—production of invoices



Process map—management of payments



Process map—management of disputes and defaults



Process map—management of prudential requirements

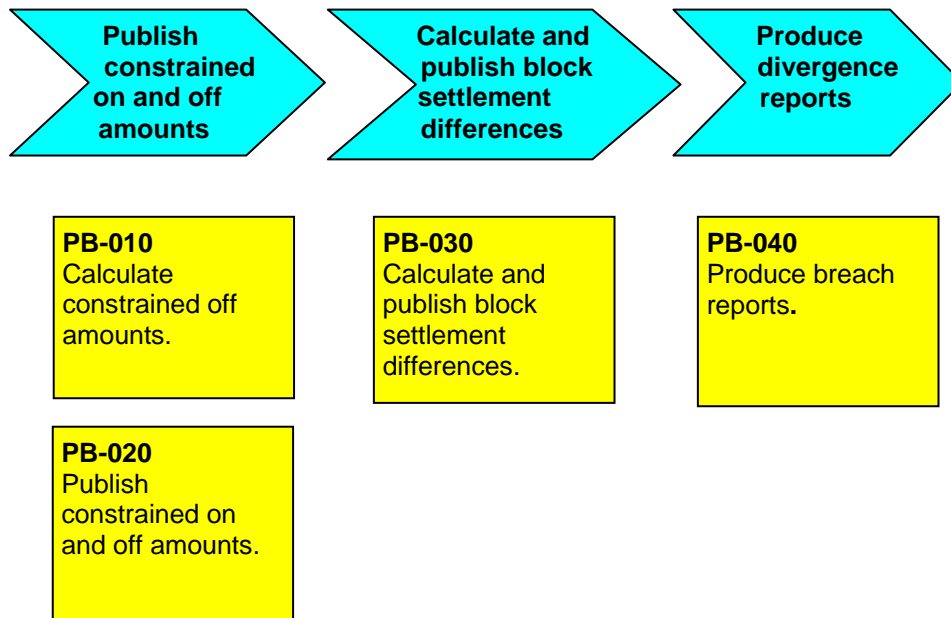


PR-010
Monitor credit
ratings and
security.

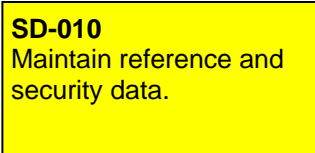
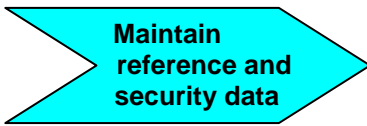
PR-020
Determine payers
current exposures.

PR-030
Provide weekly
reports.

Process map—publication of information and production of reports



Process map—maintenance of reference data



8 Sub-processes

8.1 Production of invoices

Sub-process:	IN-010 Calculate electricity purchase amounts
Process	Calculate amounts payable/receivable
Rule references	Part H rules 7.1, 7.6. part G section V rule 2. part J schedule 4 rules 2 and 15.3.
Dependencies	

Description
The clearing manager calculates for each purchaser of electricity (payer), the amount due for each trading period and grid exit at which they extracted electricity.

Business requirements
<p>The reconciliation manager must provide the clearing manager with the quantities of electricity extracted (reconciliation information) by 1600 hours on the seventh business day of each month for the previous billing period, and by 1200 hours on the last business day for wash-ups.</p> <p>The pricing manager must deliver final prices for the previous trading day, which are used to calculate the purchase amounts, to the clearing manager daily by 1200 hours, unless a provisional pricing situation occurs when final prices may be delayed by, at most, two days and be provided no later than 1800 hours on that day.</p> <p>Two business days after receiving reconciliation information for the prior billing period, the clearing manager must issue to each payer (purchaser) an invoice detailing the quantity of electricity purchased, the price charged and the payment due from the payer for each trading period and grid exit point.</p>

Data inputs															
<p>Final prices from the pricing manager provided per trading day, trading period and GIP/GXP; final prices are per MWh.</p> <p>Reconciliation information from the reconciliation manager (buyer file) as follows.</p>															
<table border="1"> <thead> <tr> <th>Field</th> <th>Format</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>GIP/GXP</td> <td>Char 7</td> <td>Valid grid exit point.</td> </tr> <tr> <td>Network ID</td> <td>Char 4</td> <td>From the NSP code (not used in this system).</td> </tr> <tr> <td>Buyer</td> <td>Char 4</td> <td>Valid purchaser code.</td> </tr> <tr> <td>Seller</td> <td>Char 4</td> <td>clearing manager code.</td> </tr> </tbody> </table>	Field	Format	Description	GIP/GXP	Char 7	Valid grid exit point.	Network ID	Char 4	From the NSP code (not used in this system).	Buyer	Char 4	Valid purchaser code.	Seller	Char 4	clearing manager code.
Field	Format	Description													
GIP/GXP	Char 7	Valid grid exit point.													
Network ID	Char 4	From the NSP code (not used in this system).													
Buyer	Char 4	Valid purchaser code.													
Seller	Char 4	clearing manager code.													

Unit	Char 3	Always 'kWh'.
Status	Char 1	I = Interim, F = Final.
Trading date	Dd/mm/yyyy	
Half-hour reconciliation quantity (1...46/48/50)	Numeric 8	Normally 48 values but 46 or 50 at daylight saving. Each value is the reconciliation quantity for the relevant trading period, ie the first value is for trading period 1, the second is for trading period 2, etc.
Checksum	Numeric 10	Sum of all half-hour values.

Processing

Validate the reconciliation information and final prices:

- a final price must exist for every grid exit point, trading date and trading period of the reconciliation information;
- grid exit points must be valid, ie there must be associated reference data; and
- buyers must be known to the system, ie there must be associated reference data.

Convert the final price to a price per kWh and calculate the purchase amount per purchaser, grid exit point and trading period.

Data outputs

Purchase of electricity record details

- if the reconciliation quantity is zero, no output is produced.

Field	Format	Description
GIP/GXP	Char 7	Valid grid exit point
Buyer	Char 4	Purchaser code.
Trading date	dd/mm/yyyy	
Trading period	Char 2	Normally 48 values but 46 or 50 at daylight saving.
Reconciliation quantity	Numeric 8	In kWh.
Final price	Numeric 8.2	In New Zealand dollars.
Purchase amount	Numeric 10.2	Calculated.

Exceptions

Invoice amounts cannot be produced if any final prices are missing.

Sub-process	IN-020 Calculate electricity sale amounts
Process	Calculate amounts payable/receivable
Rule references	Part H rules 7.1, 7.6; part G section V rule 2; part J schedule 4 rules 2 and 15.3.
Dependencies	

Description
The clearing manager calculates for each generator of electricity (payee), the amount due for each trading period and grid injection point at which they injected electricity.

Business requirements
<p>The reconciliation manager must provide the clearing manager with the quantities of electricity injected (reconciliation information) by 1600 hours of the seventh business day of each month for the previous billing period and by 1200 hours on the last business day of each month for wash-ups.</p> <p>The pricing manager must deliver final prices for the previous trading day, which are used to calculate the sale amounts, to the clearing manager daily by 1200 hours, unless a provisional pricing situation occurs when final prices may be delayed by at most two days and be provided no later than 1800 hours on that day.</p> <p>Two business days after receiving reconciliation information for the prior billing period, the clearing manager must issue to each payee (seller) a pro-forma invoice giving the sale quantity, price and amount due to the payee for each trading period and grid injection point.</p>

Data inputs																					
<p>Final prices from the pricing manager: final prices for energy are provided per trading day, trading period and GIP/GXP, where the final price is per MWh.</p> <p>Reconciliation information from the reconciliation manager, ie the seller file in the following format.</p>																					
<table border="1"> <thead> <tr> <th>Field</th> <th>Format</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>GIP/GXP</td> <td>Char 7</td> <td>Valid grid injection point.</td> </tr> <tr> <td>Network ID</td> <td>Char 4</td> <td>From the NSP code (not used in this system).</td> </tr> <tr> <td>Buyer</td> <td>Char 4</td> <td>clearing manager code.</td> </tr> <tr> <td>Seller</td> <td>Char 4</td> <td>Valid generator code.</td> </tr> <tr> <td>Unit</td> <td>Char 3</td> <td>Always "kWh".</td> </tr> <tr> <td>Status</td> <td>Char 1</td> <td>I = Interim, F = Final</td> </tr> </tbody> </table>	Field	Format	Description	GIP/GXP	Char 7	Valid grid injection point.	Network ID	Char 4	From the NSP code (not used in this system).	Buyer	Char 4	clearing manager code.	Seller	Char 4	Valid generator code.	Unit	Char 3	Always "kWh".	Status	Char 1	I = Interim, F = Final
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Unit	Char 3	Always "kWh".																			
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Trading Date	Dd/mm/yyyy	
Half hour reconciliation quantity (1...46/48/50)	Numeric 8	Normally 48 values but 46 or 50 at daylight saving. Each value is the reconciliation quantity for the relevant trading period, ie the first value is for trading period 1, the second is for trading period 2, etc.
Checksum	Numeric 10	Sum of all half hour values.

Processing

Validate the reconciliation information and final prices:

- a final price must exist for every grid injection point, trading date and trading period of the reconciliation information;
- grid injection points must be valid i.e. there must be associated reference data; and
- sellers must be known to the system as generators i.e. there must be associated reference data.

Convert the final price to a price per kWh and calculate the sale amount per generator, grid exit point and trading period.

Data outputs

Sale of electricity record details

- if the reconciliation quantity is zero, no output record is produced.

Field	Format	Description
GIP/GXP	Char 7	Valid grid exit point.
Seller	Char 4	Generator code.
Trading date	Dd/mm/yyyy	
Trading period	Char 2	Normally 48 values but 46 or 50 at daylight saving.
Reconciliation quantity	Numeric 8	In kWh.
Final price	Numeric 8.2	In New Zealand dollars.
Sale amount	Numeric 10.2	Calculated.

Exceptions

Invoice amounts cannot be produced if any final prices are missing.

Sub-process	IN-030 Calculate ancillary services costs and charges
Process	Calculate amounts payable/receivable
Rule references	Part H rules 7.1.2, 7.6.5, part C section II rule 6, part C section III rule 7.3.1, part C section IV rule 11
Dependencies	

Description

The clearing manager sends invoices to grid owners, purchasers, generators, the HVDC owner and distributors for ancillary services on behalf of the system operator for costs incurred in the provision of ancillary services. The system operator also uses the clearing manager to make payments to ancillary service agents.

There are five types of ancillary service:

- black start;
- over-frequency reserves;
- frequency keeping;
- instantaneous reserves; and
- voltage support.

For each ancillary service, the system operator provides four types of costs to the clearing manager identifying the payer or payee:

- procurement;
- administrative;
- contribution from dispensation; and
- identifiable.

These costs are recovered from grid owners, HVDC owner, purchasers, generators or distributors, depending on the type of ancillary service.

Firstly, the costs are aggregated to obtain the allocable costs for each ancillary service. Then, the total allocable cost is recovered as follows.

Ancillary service	Payer(s)	Allocation calculation
Black start	Grid owners (currently, there is one)	Currently, the total allocable cost is assigned to the grid owner. If, in future, there is more than one grid owner, the amount will be apportioned according to their ODV valuations as per rule 11.2.
Over-frequency reserves	HVDC owner	The total cost is allocated to the HVDC owner.

Frequency keeping	Purchasers	In proportion to each purchaser's off-take, less any frequency keeping provided, as per rule 11.4 (<i>see details below</i>).
Instantaneous reserves	The cost is split into three: 1. availability costs are paid by generators and the HVDC owner; 2. event costs are paid by those who caused the events; and 3. event rebates are paid to causers (as payees) with a dispensation.	The calculations are detailed in rule 11.5 (<i>see details below</i>).
Voltage support	The cost is split into three parts: 1. nominated peak charge is paid by distributors and generators holding a dispensation; 2. monthly peak-penalty charge is paid by distributors; and 3. residual charge is paid by distributors and generators holding a dispensation.	The calculations are detailed in rule 11.6 (<i>see details below</i>).

Business requirements

The clearing manager must make arrangements with the system operator to agree the format, schedule and transfer mechanism for the delivery of all necessary ancillary service information required to calculate ancillary service amounts to be paid by payers and paid to payees.

The system operator must provide the clearing manager with details of the allocable costs for each ancillary service and any other additional information required to carry out any calculations specified in part C section IV rules 11.1 to 11.6.

Two business days after receiving the reconciliation information for the prior billing period from the reconciliation manager, the clearing manager must issue an invoice to each payer and a pro-forma invoice to each payee giving the amounts of any costs for any ancillary services and/or any ancillary services administrative costs.

The clearing manager must be able to process any revisions of ancillary services costs and charges (wash-ups) and include them in the next invoice run.

Data inputs

Procurement costs per ancillary service and ancillary service agent.

Administrative costs incurred by the system operator per ancillary service.

Contributions from dispensation costs per ancillary service and asset owner.

Identifiable costs per ancillary service and participant.
Reconciliation information from the reconciliation manager (buyer file, see IN-010).
Frequency-keeping quantities per purchaser and trading period.
Island availability costs per island and trading period.
Electricity injection quantities per generating unit, grid injection point or island, and trading period.
Grid point reference data detailing the grid point, whether exit or injection, island and zone.
Instantaneous reserve quantities per generating unit and trading period.
At risk HVDC transfer quantities per island and trading period.
Instantaneous reserve quantities for at risk HVDC transfer per trading period.
Electricity loss quantity and causer (participant) per event, event time, and grid or HVDC injection point.
Payer availability costs paid per participant and billing period (for the current billing period and the two preceding).
Peak rate (\$) per kvar applicable to billing period.
Nominated peak demand quantity in kvar per zone, distributor and distributor kvar reference node applicable to the billing period (also called 'nominated kvar').
Non-compliance dispensation quantity per zone, generator, generating station and billing period.
Penalty rate (\$) per kvar applicable to billing period.
Kvar demand quantity per zone, distributor, distributor kvar reference node and trading period.
Metering information per zone, distributor, distributor kvar reference node and trading period.

Note: 'distributor kvar reference node' means either one grid point or a group of grid points.

Processing

Validate all the expected information has been received from the system operator.
Determine who is the payer or payee for each of the individual types of costs (procurement, administrative, contribution from dispensation, and identifiable) per ancillary service and output.
Calculate the total allocable cost as:
procurement + administrative – contribution from dispensation – identifiable.
Allocate the total allocable costs to the appropriate participant as payee or payer as described in part H rules 11.2 to 11.6 for each type of ancillary service noting that for:

Frequency keeping

The calculation for the allocation to purchasers uses the following information:

- reconciliation information from the reconciliation manager (buyer file, see IN-010); and
- frequency-keeping quantity per purchaser and trading period.

Instantaneous reserves

There are three parts to the allocation but the total allocable cost, calculated above, is not used directly. Instead, the system operator splits the total allocable costs into availability costs and event costs provided separately as:

- island availability costs per island and trading period; and
- electricity loss quantity and causer (participant) per event, event time, and grid or HVDC injection point.

These are allocated to the relevant participants using the calculations described in part H rules 11.5.1, 11.5.2 and 11.5.3 using the following additional information:

- electricity injection quantity per generating unit, grid injection point or island, and trading period;
- grid point reference data detailing the grid point, whether it is exit or injection, island and zone;
- instantaneous reserve quantity per generating unit and trading period;
- at-risk HVDC transfer quantity per island and trading period;
- instantaneous reserve quantity for at-risk HVDC transfer per trading period; and
- payer availability costs paid per participant and billing period (for the current billing period and the two preceding ones).

Note: rebates for under-frequency events are payments made to payees.

Voltage support

There are three parts to the allocation, and the total allocable costs calculated, above, is used only in the final part (part H rule 11.6.3) after the calculation of the nominated peak kvar charge and the monthly peak penalty charge. The basis for all the calculations described in part H rule 11.6 is provided by the system operator in the following information:

- peak rate (\$) per kvar applicable to billing period;
- nominated peak-demand quantity in kvar per zone, distributor and distributor kvar reference node applicable to the billing period (also called 'nominated kvar' in part H rule 11.6.2);
- non-compliance dispensation quantity per zone, generator, generating station and billing period;
- penalty rate (\$) per kvar applicable to billing period;
- kvar demand quantity per zone, distributor, distributor kvar reference node and

- trading period (used in part H rule 11.6.2 as 'kvar above'); and
- metering information per zone, distributor, distributor kvar reference node and trading period.

Data outputs

Procurement costs per ancillary service and ancillary service agent (as payee).
Administrative costs incurred by the system operator (as payee) per ancillary service.
Contribution from dispensation costs per ancillary service and asset owner (as payer).
Identifiable costs per ancillary service and participant (as payer).
Black start costs allocated to grid owners (as payers).
Over-frequency reserve costs allocated to the HVDC owner (as payer).
Frequency-keeping costs allocated to purchasers (as payers).
Instantaneous reserve availability costs allocated to generators and the HVDC owner (as payers).
Under-frequency event charges allocated to causers (as payers).
Under-frequency event rebates to be paid to causers holding a dispensation (as payees).
Nominated peak kvar charges allocated to distributors and generators holding a dispensation (as payers).
Monthly peak penalty charges allocated to distributors (as payers).
Residual charges allocated to distributors and generators holding a dispensation (as payers).
Also
Payee availability costs paid per participant for this billing period (stored for the processing of under-frequency rebates in the next 2 billing periods).

Exceptions

Invoice amounts cannot be produced if any reconciliation information is missing.
Depending on the type of ancillary costs, any missing pertinent information stops the process from completing.

Sub-process	IN-040 Calculate must-run dispatch auction amounts
Process	Calculate amounts payable/receivable
Rule references	Part G section IV
Dependencies	

Description
<p>Every day, the clearing manager holds an auction for the right by generators to offer electricity at zero price for specific time blocks. The reason being that some generation plants cannot be easily switched off and are required to be dispatched even at zero price.</p> <p>The clearing manager calculates the quantity of auction rights available in each time block at each auction. Generators submit up to five bids for each time block. The bids are then ranked and matched against the rights available. Bids succeed if they are matched in whole or part and are paid for by the successful generators. The revenue received from the auction is paid to purchasers according to the proportion of electricity purchased by them during each trading period.</p>

Business requirements
<p>The clearing manager must conduct a must-run dispatch auction every day.</p> <p>The clearing manager must specify the format that bids should be offered and must reject any bid not in the format.</p> <p>The clearing manager must advise generators, by 1100 hours every day, of the quantity of auction rights that will be available in the auction due to be held on the following day and invite bids for those rights.</p> <p>The clearing manager must only accept positive bids.</p> <p>The clearing manager must allow generators to change or cancel their bids up to 0900 hours on the day of the auction.</p> <p>The clearing manager must accept bids that are just for one auction and also bids that are valid till cancelled.</p> <p>By 1100 hours on the day of an auction, the clearing manager must inform all bidders of the quantity and price of all successful bids made at the auction.</p> <p>The clearing manager must issue authorisations to all successful generators setting out the auction rights won and the price to be paid for them.</p> <p>All information exchanged during the auction must be passed through the Wholesale Information and Trading System (WITS) and the clearing manager must agree the mechanism with the wholesale information and trading system service provider.</p> <p>In the event that the WITS is unavailable, the clearing manager must use the alternative arrangements previously agreed by itself, the board and generators.</p> <p>The clearing manager must keep complete records of each auction for three years including all bids received, all rights offered and all prices achieved by time block, and be</p>

able to provide generators on demand with the details of their bids and the outcome of any auction within that period.

Data inputs

Bids from generators.

Historical load data from grid owners.

Reconciliation information from the reconciliation manager.

Processing

Calculate the quantity of auction rights available for auction for each time block by determining the lowest demand in the trading periods of the corresponding time block of the day after the auction day in the preceding year and multiplying it by a fixed factor (see formula in section IV rule 3.6).

Match the bids for each time against the available rights by ranking the bids in descending order by price per MWh then allocating the auction rights accordingly until there are none left (see section IV rules 3.10, 3.11, 3.12).

Calculate the amounts payable to each purchaser for each trading period of each time block by apportioning the total auction revenue for the time block equally to each trading period in the block then allocating that revenue to the purchaser according to their percentage of the total electricity purchased during the trading period (see formula in section IV, rule 2.6).

Calculate the amounts receivable from each generator for each time block from the price and quantity of auction rights acquired by the generator for the block.

Include amounts receivable and payable on the relevant party's invoice in the next invoice run.

Data outputs

Amounts receivable from generators.

Amounts payable to purchasers.

Authorisations to successful bidders specifying what quantities they may offer, during what trading periods and the amount they owe the clearing manager.

The outcome of the auction to all bidders.

The price and quantity of all successful bids to all generators and purchasers.

Exceptions

The auction cannot proceed if the historical load information is not provided by the grid owner.

Sub-process	IN-050 Calculate hedge settlement amounts
Process	Calculate amounts payable/receivable
Rule references	Part H schedule H5
Dependencies	

Description
<p>Purchasers and generators may arrange hedge contracts for the purchase and sale of a quantity of electricity at a fixed price. The difference between the fixed and floating price is paid by one party to the other. The settlement of this amount and management of the contract is conducted by the clearing manager.</p> <p>The hedge contracts specify the parties involved, fixed price and quantity in MWs for specific trading periods at specific grid points.</p> <p>Note: the Rules do not specify the basis for the closing price for hedge contracts. The current assumption is it is the appropriate final price(s). Confirmation by the Commission is necessary prior to any system development.</p>

Business requirements
<p>The clearing manager must calculate the amount payable for each billing period and notify both parties by the fifth business day of the relevant billing period.</p> <p>In the case of a dispute between the parties over the amount, the clearing manager must use reasonable endeavours to resolve the dispute by the ninth business day of the billing period.</p> <p>The clearing manager must include the amounts payable/receivable on the tax and pro-forma invoices of the appropriate party.</p>

Data inputs
<p>Final prices from the pricing manager.</p> <p>Hedge contract details.</p>

Processing
<p>Although not specified in the Rules, this document assumes that the price applicable to the hedge contract quantities is the difference between the hedge contract price and the appropriate final price.</p> <p>If the contract fixed price is less than the floating price, the difference is payable by the floating payer.</p> <p>If the contract fixed price is greater than the final price, the difference is payable by the fixed payer.</p> <p>The individual amounts payable are summed for all the trading periods in the billing period. Only the net amount is paid/received.</p>

Data outputs
Hedge settlement agreement settlement amount.

Sub-process	IN-060 Calculate constrained-on amounts
Process	Calculate amounts payable/receivable
Rule references	Part H rules 7.1, 7.6.2, 8.1, 8.2.2. part G section V rules 3.8, 5.3 to 5.9, 6. section III rules 3,8 and 4.9.1. part G schedule G1.
Dependencies	

Description
<p>The clearing manager calculates the compensation for each generator constrained on during any trading period of the billing period. The clearing manager allocates the constrained-on compensation that is not attributable to the system operator for payment by all purchasers.</p> <p>A constrained-on situation occurs in a trading period when the generator is given a dispatch instruction to generate a quantity of electricity that was offered at a price higher than the final price published for the grid injection point.</p> <p>The clearing manager determines whether a constrained-on situation occurred in any trading period and the quantity that was constrained on. Compensation is calculated for the constrained-on quantity within each offer band, at a price that is the difference between the final price and the offer price of the band.</p> <p>The clearing manager notifies the system operator of the constrained-on amounts attributable to them. The remainder is invoiced to purchasers in proportion to their market share.</p> <p>Note: currently, there are no precise definitions for the terms ‘scheduled quantity’ and ‘metered quantity’ in the Rules. Assumptions made as to their meaning in this sub-process will require confirmation by the Commission prior to any development undertaken.</p>

Business requirements
<p>The service provider must make arrangements with the system operator, reconciliation manager and pricing manager and agree the format, schedule and transfer mechanism for the delivery of all necessary information required by the clearing manager to calculate constrained-on compensation.</p> <p>By 1600 hours of the eighth business day of each billing period the clearing manager must calculate constrained-on amounts for the previous billing period and also send to the system operator details of the constrained-on amounts attributable to them.</p> <p>The reconciliation manager must provide reconciliation information to the clearing manager by 1600 hours of the seventh business day of each month for the previous billing period and by 1200 hours on the last business day of each month for wash-ups.</p> <p>The pricing manager must deliver final prices to the clearing manager daily by 1200 hours for the previous trading day, unless a provisional pricing situation occurs when final prices may be delayed by, at most, two days and be provided no later than 1800 hours on that day.</p>

Dispatch instructions and details of constrained-on situations attributable to the system operator must be delivered to the clearing manager by 1600 hours on the seventh business day of each billing period.

The system operator must provide trading period information to the clearing manager, including final bids and offers, daily by 0730 hours.

The system operator and generators must notify the clearing manager within five business days of the effective date, if offers are changed in terms of being offered by block, station dispatch group or by individual stations.

Two business days after receiving reconciliation information for the prior billing period, the clearing manager must issue an invoice to each payer and a pro-forma invoice to each payee detailing any constrained-on amounts due.

Data inputs

Final offers (*see below*).

Final prices per MW for energy provided per trading day, trading period and GIP/GXP.

Reconciliation information (buyer and seller files).

Dispatch instructions/log providing the time and dispatch quantity requested per block/station dispatch group or individual station.

Constrained-on situations attributable to the system operator provided per trading period per block/station dispatch group or individual station for voltage support, non-security and frequency keeping (for non-security and frequency keeping a quantity is also provided).

Reference information on the organisation of blocks and station dispatch groups.

Offer details (refer part G schedule G1)

Information input	Format	Mandatory/optional	Comments
Generator code	Char 4	M	Code allocated by the reconciliation manager to the participant.
Grid injection point	Char 7	M	
Station	Char 3	M/O	Mandatory if no unit.
Unit	Numeric 2	M/O	Mandatory if no station
Trading date	Date	M	Trading Date to which the offer applies (DD/MM/YYYY)
Trading period	Numeric 2	M	Trading period to which the offer applies. 1 to 48 for standard day,

Information input	Format	Mandatory/optional	Comments
			1 to 50 for daylight saving end, 1 to 46 for daylight saving start.
Generator maximum output (including overload)	Quantity	M	MW Must be less than or equal the maximum that can be generated by the plant as recorded in the reference data.
Maximum generator ramp Up Rate	Quantity	M	MW/hr
Maximum generator ramp down rate	Quantity	M	MW/hr
Band 1 quantity	Quantity	M	The first quantity of MWs.
Band 1 price	Price	M	
Band 2 quantity	Quantity	O	For the second quantity of MWs.
Band 2 price	Price	O	
Band 3 quantity	Quantity	O	For the third quantity of MWs.
Band 3 price	Price	O	
Band 4 quantity	Quantity	O	For the fourth quantity of MWs.
Band 4 price	Price	O	
Band 5 quantity	Quantity	O	For the fifth quantity of MWs.
Band 5 price	Price	O	

Reconciliation information—buyer and seller file

Field	Format	Description
GIP/GXP	Char 7	Valid grid exit point.
Network ID	Char 4	From the NSP code (not used in this system).
Buyer	Char 4	Valid purchaser code for purchases or the clearing manager code for sales.
Seller	Char 4	Valid generator code for sales or the clearing manager code for purchases.
Unit	Char 3	Always 'kWh'.

Status	Char 1	I = interim; F = final.
Trading date	Date	
Trading period reconciliation quantities (1...46/48/50)	Numeric 8	Normally 48 values but 46 or 50 at daylight saving. Each value is the reconciliation quantity for the relevant trading period, ie the first value is for trading period 1; the second is for trading period 2, etc.
Checksum	Numeric 10	Sum of all trading period reconciliation quantities.

Processing

Determine if a constrained-on situation occurred for a trading period for a generator by:

- obtaining final offers for all generators and generating stations for all trading periods within the billing period;
- aggregating offers by block dispatch group or station dispatch group, if the system operator dispatches by block or station dispatch group rather than by individual generating station;
- ranking of (aggregated or non-aggregated) offers;
- extracting the ramp-up and ramp-down rates from the offers;
- extracting the relevant dispatch instructions for the block dispatch group, station dispatch group or individual station;
- calculating the dispatched quantity for each trading period from the dispatch instructions. (The dispatch instructions record only the time an instruction was given to the generator and the quantity of electricity required to be generated. Therefore, the calculation involves conversion of the time to the relevant trading period, including the correct conversion for daylight saving, and the application of the ramp-up and ramp-down rates to obtain a time-weighted average quantity for the trading period. Another element included in the calculation of the dispatch quantity is any quantity of frequency-keeping bandwidth provided);
- obtaining the 'metered quantity' from the reconciliation information of all purchases and sales for each trading period from the reconciliation manager;
- obtaining final prices for each grid injection point and trading period in the billing period from the pricing manager;
- finding the total 'scheduled quantity' from the aggregated offer quantity level (from the aggregated ranked offers) offered at a price at or below the final price; and
- finding the maximum aggregated offer quantity, ie the maximum quantity offered.

Note: a constrained-on situation occurs if the 'scheduled quantity' is less than the dispatched quantity and the 'metered quantity'.

Determine the constrained-on quantity by calculating the lower of the minimum

difference between the scheduled quantity and the dispatched quantity, the scheduled quantity and the metered quantity, the scheduled quantity and the maximum quantity offered.

Determine the constrained-on amounts attributable to the system operator by assigning the whole of the constrained-on amount to the system operator for those trading periods in which voltage support occurred, but assigning only that part of the constrained-on amount proportional to the maximum quantity for which the system operator was responsible for those trading periods in which non-security and frequency keeping occurred.

Determine the invoice amounts for generators, purchasers and the system operator such that generators are paid the whole of their constrained-on compensation by the system operator and the purchasers combined. Purchasers are allocated a portion of the constrained-on amount (not attributed to the system operator) in proportion to their purchase quantities as per the reconciliation information for the billing period.

Publish the details on the wholesale information and trading system of the constrained-on amounts in relation to each generator for the previous billing period per block/station dispatch group or individual station and trading period, and also publish the amounts applicable to the system operator.

Deliver details of the constrained-on amounts attributable to the system operator in the agreed format and manner.

Data outputs

Constrained-on amounts attributable to the system operator.

Total constrained-on amounts per generator and trading period

Constrained-on amounts payable (to payers) or receivable (to payees) to be included in invoices.

Additional extra information about the constrained-on calculations requested by any generator, purchaser or the board.

Exceptions

Invoice amounts cannot be produced if any final prices, dispatch instructions or reconciliation information are missing.

Sub-process	IN-070 Calculate wash-up amounts
Process	Calculate amounts payable/receivable
Rule references	Part H rules 7.1, 7.6.3, 8.2, 8.2.3 and 11. Part J schedule 4 rule 2. Part C section IV rule 11.8.
Dependencies	

Description
<p>The clearing manager recalculates for each purchaser and generator the invoice amounts for a previous billing period or periods. The differences between the original invoiced amounts and the new invoiced amounts are included in the next invoice run as either a credit or debit with interest applied.</p> <p>Revised reconciliation information impacts the invoice amount, calculations of electricity purchases, electricity sales, constrained-on compensation, must-run dispatch auction and ancillary services.</p> <p>A recalculation is also be required if revised information is provided by the system operator for ancillary services.</p>

Business requirements
<p>A wash-up run must be done whenever the reconciliation manager provides revised reconciliation information or the system operator provides revised ancillary services information.</p> <p>The reconciliation manager must provide revised information by 1200 hours on the last business day of each billing period for billing periods 3, 7 and 14 months prior to the current one.</p> <p>Note: the reconciliation manager always provides a complete set of reconciliation information not just changes.</p> <p>Invoices issued to payers and payees must include any wash-up amounts together with the associated interest amounts.</p> <p>Information must be provided to payers and payees, which includes the original invoiced amounts, the revised invoice amounts and the net wash-up amount payable or receivable together with the supporting details.</p> <p>Interest must be calculated on wash-up amounts.</p> <p>Interest must be accrued from the payment due date of the original invoice until the issue date of the next invoice in which the wash-up amounts are included. The issue date is the 9th business day of the billing period.</p> <p>Interest must be calculated daily at the bank bill bid rate, less any deductions for resident withholding tax, compounded at the end of each calendar month.</p>

Data inputs

Revised reconciliation information from the reconciliation manager.

Revised ancillary services information from the system operator.

Any other revised information that impacts the invoicing process, eg the organisation of block dispatch groups etc.

Daily bank-bill bid rates.

Processing

Re-run the invoicing process for the relevant billing period for which revised information has been received.

Obtain the invoicing amount information from the original invoicing run for the relevant billing period.

Calculate the differences between the original invoice run and the revised invoice run. These are the wash-up invoice amounts.

Deliver the wash-up run outputs to payers and payees.

Include the wash-up amounts in the next invoice and include details of the associated billing period.

Calculate any wash-up interest using the daily bank bill bid rate, compounding at month end.

Include the wash-up interest amounts in the next invoice.

Data outputs

Original invoiced amounts.

Revised invoice amounts.

Wash-up amounts, payable or receivable.

Wash-up interest amounts, payable or receivable.

Supporting details relating to the revised invoice amounts.

Supporting details relating to the wash-up interest amounts.

Exceptions

The calculation of wash-up interest cannot be completed if a bank bill bid rate is not present for each business day.

Invoice amounts cannot be produced if any final prices are missing.

Sub-process	IN-080 Calculate fees and taxes
Process	Calculate amounts payable/receivable
Rule references	Part H rule 2.6.8. and 7.6.7
Dependencies	

Description
The clearing manager includes payments for fees and extra taxes (in addition to GST) on invoices. These may include bank fees incurred by the clearing manager in the management of prudential requirements or additional taxes imposed by the IRD.

Business requirements
The clearing manager must be able to include fees and extra taxes on invoices and pro-forma invoices.

Data inputs
Fee or tax type, description, payer or payee, fee amount, GST amount (if applicable).

Processing
Validate the input and include it in the relevant invoice.

Data outputs
Invoice amounts for fees and/or taxes for the relevant party. Applicable tax returns to the IRD.

Sub-process	IN-090 Calculate loss and constraint excesses
Process	Calculate amounts payable/receivable
Rule references	Part H rule 12 and 8.4
Dependencies	

Description
<p>The clearing manager pays the grid owner for loss and constraint excesses. These are the differences between the electricity purchases and sales invoice amounts, subject to rule 8.4.</p> <p>The Board notifies the clearing manager what proportion of this difference is to be paid to the grid owner.</p>

Business requirements
<p>The clearing manager must pay the grid owner the loss and constraint excess subject to rule 8.4, and in accordance with the proportion notified by the board.</p> <p>If no notification is provided, the clearing manager must pay the full amount to the grid owner.</p>

Data inputs
Purchaser and generator invoice amounts for the purchase and sale of electricity.

Processing
<p>Calculate the difference between the total invoice amounts of electricity purchases and sales for each billing period, including wash-up billing periods.</p> <p>Include invoice amounts on the grid owner's pro-forma invoice for the current billing period and any wash-up billing periods.</p>

Data outputs
Invoice amounts for loss and constraint excess for the grid owner.

Sub-process	IN-100 Calculate GST
Process	Calculate amounts payable/receivable
Rule references	Part H rule 7.6.8 and 8.2.8.
Dependencies	

Description
The clearing manager calculates the goods and services tax (GST) payable on those invoiced amounts that attract it.

Business requirements
Invoices must show GST for those amounts on which it is payable. Currently, neither hedge settlement amounts nor interest payments attract GST. Completion of GST returns to the IRD.

Data inputs
Invoice amounts. Invoice amount categories that attract GST. GST rate applicable to billing/consumption month. GST rates specific to particular categories, eg fees and taxes.

Processing
Calculate GST on all invoice amounts that attract GST at the appropriate GST rate.

Data outputs
GST amounts for each applicable invoice amount. GST return.

Sub-process	IN-110 Produce tax and pro-forma invoices
Process	Produce invoices
Rule references	Part H rule 7.6, 7.6.9, 8.2, 8.2.9, 11.7
Dependencies	IN-010, IN-020, IN-030, IN-040, IN-050, IN-060, IN-070, IN-080, IN-090, IN-100

Description
<p>The clearing manager issues tax invoices to payers and pro-forma invoices to payees. Before it can be determined which type of invoice is to be issued, the net invoice amount must be calculated. If the net amount indicates that the amount should be paid to the clearing manager, a tax invoice is issued otherwise a pro-forma invoice is issued.</p>

Business requirements
<p>Tax invoices or pro-forma invoices must be generated according to the total invoice amount payable or receivable.</p> <p>Invoices must contain summary information, be printable, and conform to the standards and requirements of the Inland Revenue Department of New Zealand.</p> <p>Invoices must include GST and the net amounts payable and/or receivable.</p> <p>Supporting information must be provided in a file format for all invoice amounts.</p>

Data inputs
<p>Invoice amounts.</p> <p>GST amounts.</p> <p>Net amount payable or receivable.</p>

Processing
<p>Calculate the net amount payable or receivable and format the invoice accordingly.</p> <p>Create a printable version of the invoice.</p> <p>Generate in a file the supporting details for each invoice amount.</p>

Data outputs
<p>Tax invoices and pro-forma invoices.</p> <p>Supporting details for each invoice amount.</p>

Exceptions
<p>Note: payees or payers who have ceased to be a participant are still invoiced for any amounts receivable and payable calculated as a result of wash-ups for billing periods when they were still participants.</p>

Sub-process	IN-120 Send invoices to participants
Process	Deliver invoices
Rule references	Part H rule 7.7
Dependencies	

Description
The clearing manager delivers invoices and supporting information to payees and payers on the ninth business day of each month.

Business requirements
<p>The clearing manager must issue invoices to payers and payees two business days after receiving reconciliation information from the reconciliation manager.</p> <p>If the invoices are issued late, then the clearing manager must notify payers of the new payment date.</p> <p>The clearing manager must deliver the invoices and supporting information to payees and payers electronically via the wholesale information and trading system, or fax the details if the electronic facility is not available.</p> <p>The clearing manager must also deliver the invoices by mail if requested.</p> <p>Supporting information must be provided in a file.</p> <p>The clearing manager must ensure that invoices and supporting details are only delivered to the payee or payer to whom the information relates.</p> <p>Delivery must be via a secure electronic delivery mechanism.</p> <p>A backup secure fax facility must be available to be used to deliver invoices and supporting information if the secure electronic facility is unavailable.</p>

Data inputs
<p>Tax invoices and pro-forma invoices.</p> <p>Supporting details for each invoice amount.</p>

Processing
Deliver the invoices and the supporting information to the relevant payee and payer using the secure electronic facility or the backup secure fax facility.

Data outputs
<p>Tax invoices and pro-forma invoices.</p> <p>Supporting details for each invoice amount.</p>

Sub-process	IN-130 Receive confirmation
Process	Deliver invoices
Rule reference	Part H rule 7.7, 7.8, 7.9
Dependencies	

Description
Each payer is required to confirm the receipt of their invoice and its supporting details to the clearing manager. The clearing manager checks a confirmation has been received from every payer by 1200 hours of the next business day after the invoices were sent.

Business requirements
The clearing manager must check whether a confirmation has been received. The clearing manager must be able to re-send invoices and supporting information when necessary.

Data inputs
Confirmations. Tax invoices and pro-forma invoices. Supporting details for each invoice amount.

Processing
Check confirmations. Re-send invoices and supporting information to the appropriate party.

Data outputs
Tax invoices and pro-forma invoices. Supporting details for each invoice amount.

8.2 Management of payments

Sub-process	MP-010 Receive payments from payers
Process	Receive payments
Rule references	Part H rule 7.2
Dependencies	

Description
Each payer is required to pay the total amount of their tax invoice in cleared funds into the clearing manager's operating account by 1600 hours on the twentieth calendar day (or the next business day if this is not a business day).

Business requirements
The clearing manager must check their operating account for an acknowledgment that payment has been received from each and every payer.

Data inputs
Operating bank account payment details.

Processing
Check operating bank account, using whatever mechanism is provided by the bank for this purpose.

Data outputs
Confirmation that the total invoice amounts have been received from each payer.

Sub-process	MP-020 Allocate payments received to payees
Process	Allocate and pay payees
Rule references	Part H rule 8.4 to 8.12, 9.
Dependencies	IN-010, IN-020, IN-030, IN-040, IN-050, IN-060, IN-070, IN-080, IN-090, IN-100

Description
<p>The clearing manager pays all payees their invoice amounts owing, provided all payers have paid their invoice amounts in full.</p> <p>If all payers have not paid in full, then the clearing manager prioritises payments as described in rules 8.4 to 8.12.</p> <p>In the situation where generators are not paid the full amount, the clearing manager may be liable for interest on any unpaid amounts and therefore may need to calculate interest daily on the unpaid amount.</p> <p>All further payments are paid in accordance with the priorities to the earliest billing period in default.</p>

Business requirements
<p>The clearing manager must pay payees their pro-forma invoice totals unless payers do not pay their full amount i.e. are in default.</p> <p>In a default, the default procedures detailed in rule 9 must be followed and any payments received must be paid out in accordance with rules 8.4 to 8.12.</p>

Data inputs
<p>Operating bank account payment details.</p> <p>Invoice amounts of generators, system operator and grid owner.</p> <p>GST amounts.</p>

Processing
<p>Check bank account using whatever mechanism is provided by the bank for this purpose.</p> <p>On payment in full, pay all payees otherwise allocate as per rules 8.4 to 8.12. and calculate daily interest on the defaulted amount using the default interest rate from the payment due date to the date full payment is received.</p> <p>In a default situation, accept further payments and allocate again according to rules 8.4 to 8.12.</p> <p>Issue the Buyer Created Tax Invoices (BCTI's) to payees stating the exact amounts payable.</p>

Data outputs
Full or part payments to payees. BCTI's to payees.

8.3 Management of disputes and defaults

Sub-process	MD-010 Manage disputes
Process	Manage disputes and defaults
Rule references	Part H rule 7.3 and 10
Dependencies	

Description
<p>When payees and payers dispute invoices within 2 years, the clearing manager will investigate and resolve the dispute as described in rule 10, which describes the disputes procedure, and include the notification of affected parties.</p> <p>The clearing manager may recalculate the invoices for the latest billing period, provided revised information has been received at least 2 business days prior to the payment due date. The disputes relating to prior billing periods are resolved using the wash-up process (see IN-060).</p>

Business requirements
<p>In the event of a dispute where revised information is provided 2 business days prior to the payment due date, the clearing manager must be able to re-calculate and re-issue invoices for the current billing period.</p> <p>For prior billing periods, provided revised information is provided for those prior billing periods, the clearing manager must be able to conduct the wash-up process (IN-060). Wash-ups must, however, only be conducted for any of the prior 24 billing periods.</p> <p>The clearing manager must notify affected participants if invoices are to be recalculated.</p>

Data inputs
<p>Revised reconciliation information from the reconciliation manager.</p> <p>Revised ancillary services information from the system operator.</p> <p>Any other revised information that impacts the invoicing process, eg the organisation of block dispatch groups.</p> <p>Revised daily bank bill bid rates.</p>

Processing
Re-run the invoice process for the latest billing period.

Re-run the wash-up process for any prior billing period.
Resend invoices as per process IN-110.
Re-check confirmations as per process IN-120.

Data outputs

Revised invoices.

Sub-process	MD-020 Manage defaults
Process	Manage disputes and defaults
Rule references	Part H rules 7.4, 3.1.3 and 9
Dependencies	

Description
<p>An event of default occurs if one or more of the following situations arises:</p> <ul style="list-style-type: none"> • a payer fails to pay the full amount of an invoice by payment due date; • a payer fails to satisfy a call by the clearing manager to maintain their level of security with respect to prudential requirements in accordance with rule 3.1.3; • a payer becomes involved in statutory management or investigation as described in rule 9.1.3; • a payer becomes involved in a scheme of arrangement or composition with creditors as described in rule 9.1.4; • a payer becomes involved in a receivership or liquidation as described in rule 9.1.5; or • the clearing manager has reasonable grounds to believe that an event of default is likely to occur and notifies the board. <p>In the event of a default, the clearing manager has the power to exercise a number of remedies as described in rules 9.4 to 9.7 and rules 10</p>

Business requirements
<p>The clearing manager must be vigilant for the possibility of default by participants.</p> <p>The clearing manager must exercise the remedies available under the rules and the law in order to ensure payment is met.</p>

Data inputs

Processing
Notify Board.

Data outputs

Exceptions

8.4 Management of prudential requirements

Sub-process	PR-010 Monitor credit ratings & security
Process	Manage prudential requirements
Rule references	Part H rule 2
Dependencies	

Description
Once payers have provided the clearing manager with proof that they will be able to meet their financial obligations under the Rules, the clearing manager regularly monitors their continued ability to meet those obligations.

Business requirements
<p>The clearing manager must ensure that all payers satisfy the prudential requirements at all times.</p> <p>The clearing manager must keep a record of and manage appropriately all security provided to it by payers, especially cash deposits (see part H rule 2.6).</p> <p>The clearing manager must allow payers to change the form of security they have provided (see part H rule 2.7).</p> <p>The clearing manager must allow payers to reduce the amount of security they have provided as long as doing so would not compromise the payers ability to meet their prudential requirements, and must effect the reduction within 1 business day (see part H rule 2.8).</p>

Data inputs
<p>Evidence of an acceptable credit rating as defined in part H rule 2.5, or acceptable security as defined in part H rule 2.4.</p> <p>Information from payers concerning significant changes to the size of their business, changes or likely changes to credit ratings, or changes to their other forms of security.</p>

Processing
The clearing manager validates the prudential position of payers and ensures that all prudential requirements continue to be met.

Data outputs
<p>A record of every type of security provided by each payer.</p> <p>Trust account statements for cash deposits.</p>

Sub-process	PR-020 Determine payers current exposure
Process	Manage prudential requirements
Rule references	Part H rule 3
Dependencies	MD-020

Description
The aim of the management of prudential requirements for payers is to ensure that they can meet their financial obligation under the Rules. To this end the clearing manager estimates their expected exposure of each payer on a weekly basis and checks that the current level of security held for the payer is sufficient to cover that exposure.

Business requirements
The clearing manager must calculate each week the minimum amount of security required from those payers required to provide it. Where the existing security level is calculated to be less than the new minimum security level, the clearing manager must write to the payer requiring the extra amount i.e. a call. If the payer fails provide the extra amount, the clearing manager must issue a notice of the event of default in relation to the payer.

Data inputs
Current security levels. Reconciliation information from the reconciliation manager. Ancillary services information and under-frequency event information from the system operator.

Processing
Calculate the clearing manager's net exposure to each payer, including GST, as the sum of estimates of that payer: <ul style="list-style-type: none"> • amounts for purchases or expected purchases of electricity; • amounts from sales or expected sales of electricity; • amounts incurred or expected to be incurred for ancillary services; • amounts due under hedge settlement agreements; and • unpaid amounts incurred due to under-frequency events. <p>N.B. There is no method defined in the Rules for estimating the above amounts but part H rules 3.3 and 3.4 give a list of factors that may be considered, and rule 3.5 specifically forbids consideration of wash-ups.</p> <p>Record any changed minimum levels of security for payers.</p>

Data outputs

Exposure estimates.

New minimum levels of security.

Calls on payers for the extra amounts corresponding to those changed levels.

Sub-process	PR-030 Provide weekly reports
Process	Manage prudential requirements
Rule references	Part H rule 4.6
Dependencies	PR-020

Description
The clearing manager produces a set of weekly reports for payers and payees.

Business requirements
The clearing manager must provide the full set of reports every week.

Data inputs
Exposure estimates for all payers (from PR-020).

Processing
<p>Generate an individual report for each payer detailing the estimated exposure amount and stating whether an adjustment to the current level of security is considered likely to be required in the current or next billing period.</p> <p>Generate a summary of the position of all payers for each payee, without identifying any individual payer.</p> <p>If any payer has defaulted on a call, produce a notice of the occurrence for publication.</p>

Data outputs
<p>Individual reports for each payer.</p> <p>Summary reports for each payee.</p> <p>Notice of any defaults.</p>

8.5 Publication of information and production of reports

Sub-process	PB-010 Calculate constrained-off amounts
Process	Publish constrained on and off amounts
Rule references	Part G section V rules 3.8, 4.3 to 4.8 and part G Section III rules 3, 8 and 4.9.1. Part G schedule G1
Dependencies	IN-060

Description
<p>The clearing manager calculates the constrained-off amounts for each generator during any trading period of the billing period for publication. This information is only published as no amounts are payable or receivable for constrained-off situations.</p> <p>A constrained-off situation occurs in a trading period when the generator was not given a dispatch instruction to generate a quantity of electricity that was offered at a price below the final price published for the grid injection point.</p> <p>The quantity constrained off is calculated within each offer band, at a price that is the difference between the final price and the offer price of the band.</p> <p>The clearing manager notifies the system operator of the constrained-off amounts attributable to them.</p> <p>The calculation of constrained-off can be determined in the same process as the calculation of constrained-on described in process IN-060. The same calculations are applied except for the determination of the constrained-off situation and the calculation of the constrained-off quantity.</p> <p>N.B. Currently there are no precise definitions for the terms scheduled quantity and metered quantity in the Rules. Assumptions have been made as to their meaning in this sub-process but will require confirmation by the Commission prior to any development being undertaken.</p> <p>Also, there is a question as to the whether constrained off situation is when the offer price is <u>at or below</u> the final price or only <u>below</u> the final price. Further clarification will be required from the Commission.</p>

Business requirements
The same as for constrained on calculations - IN-060.

Data inputs
Same as for the constrained on calculation - IN-060

Processing

Determine if a constrained-off situation occurred for a trading period for a generator by:

- obtaining final offers for all generators and generating stations for all trading periods within the billing period;
- aggregating offers by block dispatch group or station dispatch group, if the system operator dispatches by block or station dispatch group rather than by individual generating station;
- ranking of (aggregated or non-aggregated) offers;
- extracting the ramp-up and ramp-down rates from the offers;
- extracting the relevant dispatch instructions for the block dispatch group, station dispatch group or individual station;
- calculating the dispatched quantity for each trading period from the dispatch instructions (The dispatch instructions only record the time an instruction was given to the generator and the quantity of electricity required to be generated. The calculation therefore involves conversion of the time to the relevant trading period, including the correct conversion for daylight saving, and the application of the ramp-up and ramp-down rates to obtain a time-weighted average quantity for the trading period. Another element included in the calculation of the dispatch quantity is any quantity of frequency-keeping bandwidth provided);
- obtaining the metered quantity from the reconciliation information of all purchases and sales for each trading period from the reconciliation manager;
- obtaining final prices for each grid injection point and trading period in the billing period from the pricing manager;
- finding the total scheduled quantity from the aggregated offer quantity level (from the aggregated ranked offers) offered at below the final price; and
- finding the maximum aggregated offer quantity, ie the maximum quantity offered.

A constrained off situation occurs if the *scheduled quantity* is greater than both the dispatched quantity and the *metered quantity*.

Determine the constrained-off quantity by calculating the maximum difference between the *scheduled quantity* and the *dispatched quantity* or the *scheduled quantity* and the *metered quantity*.

Determine the constrained-off amounts attributable to the system operator by assigning the whole of the constrained-off amount to the system operator for those trading periods in which voltage support occurred, but assigning only that part of the constrained-off amount proportional to the maximum quantity for which the system operator was responsible for those trading periods in which non-security and frequency keeping occurred.

Publish the details on the WITS of the constrained-off amounts in relation to each generator for the previous billing period per block/station dispatch group or individual station and trading period, and also publish the amounts applicable to the system operator.

Deliver details of the constrained-off amounts attributable to the system operator in the agreed format and manner.

Data outputs

Constrained-off amounts attributable to the system operator.
Total constrained-off amounts per generator and trading period
Additional extra information about the constrained-on calculations requested by any generator, purchaser or the Board.

Exceptions

Constrained-off amounts cannot be calculated if any final prices, dispatch instructions or reconciliation information are missing.

Sub-process	PB-020 Publish constrained-on and constrained-off amounts
Process	Publish constrained on and off amounts
Rule references	Part G section V rules 4.6, 5.7, 5.9
Dependencies	

Description
The clearing manager publishes constrained-on and constrained-off amounts.

Business requirements
The clearing manager must publish the constrained-on and constrained-off amounts via the Wholesale Information and Trading System by 1600 hours on the 8 th business day of each billing period. The information must be both viewable online and able to be downloaded.

Data inputs
Constrained-on and constrained-off amounts (quantities) and the amount constrained on and constrained off that is attributable to the system operator per: <ul style="list-style-type: none"> • generator • trading day • trading period • GIP or block or station dispatch group • whether constrained on or constrained off

Processing
Transfer the information to the WITS for publication.

Data outputs
Same as inputs.

Sub-process	PB-030 Publish settlement differences
Process	Publish settlement differences
Rule references	Part H rule 13.5 to 13.8
Dependencies	

Description
<p>The clearing manager is required to calculate and publish block settlement differences via the WITS. These are the differences between the amounts settled when generating plants/units are treated as a block as against the amounts that would have been settled if they had been dispatched individually.</p> <p>The basis of the calculation is the dispatch instructions log. As well as providing details of the dispatch instructions given for each block, the log also lists, per individual generating plant/unit, the instructions that would have been given if they were dispatched individually. The instructions are used to calculate the generation quantity per trading period for each generating plant/unit within a block as well as for the block itself.</p> <p>The dispatch instructions only record the time an instruction was given to the generator and the quantity of electricity required to be generated. The calculation of the generation quantity therefore involves conversion of the time to the relevant trading period (including the correct conversion for daylight saving) and the application of the ramp-up and ramp-down rates to obtain a time-weighted average quantity for the trading period.</p>

Business requirements
<p>The clearing manager must publish each billing period the constrained-on and constrained-off amounts via the WITS by 0900 hours on the 2nd business day after the pro-forma invoices have been delivered.</p> <p>The system operator must deliver dispatch instructions to the clearing manager by 1600 hours on the 7th business day of each billing period.</p> <p>The reconciliation manager must provide reconciliation information to the clearing manager by 1600 hours of the 7th business day of each month for the previous billing period and by 1200 hours on the last business day of each month for wash-ups.</p> <p>The pricing manager must deliver final prices to the clearing manager daily by 1200 hours for the previous trading day, unless a provisional pricing situation occurs when final prices may be delayed by at most 2 days and be provided no later than 1800 hours on that day.</p> <p>The system operator must provide trading period information to the clearing manager, which includes final bids and offers, daily by 0730 hours.</p> <p>The system operator and generators must notify the clearing manager within 5 business days of the effective date, if offers are changed in terms of being offered by block, station dispatch group or by individual stations.</p> <p>Information must be viewable online and able to be downloaded.</p>

Settlement differences must not to be calculated for wash-ups.

Data inputs

Dispatch instructions for the billing period.

Final prices.

Reconciliation information - see the constrained-on calculation for details.

Final offers (to obtain ramp rates) - see the constrained-on calculation for details.

Reference data detailing the generating plants/units within each block.

Processing

For each block and trading period, calculate the generation quantity for the block and for each generating plant/unit within the block as described in rule 13.5.2.

For each block and trading period, aggregate the reconciliation quantities for the block and for each generating plant/unit within the block.

Apply the formulas described in rule 13.5 then aggregate for each block across the whole billing period. (Only two figures are published per block for the whole billing period: the maximum settlement difference and the total settlement difference).

Transfer information to WITS for publication.

Data outputs

Per Block

- The maximum block settlement difference
- The total block settlement difference

Sub-process	PB-040 Produce breach reports
Process	Produce divergence reports
Rule references	Part H rule 13.1 to 13.2
Dependencies	

Description
The clearing manager is required to deliver a monthly divergence report detailing any rule breaches by payees and payers as well as by the clearing manager itself.

Business requirements
The clearing manager must deliver the divergence reports to the market administrator (the Commission) by 0900 hours on the 10th business day of each calendar month.

Data inputs
Instances of breaches and the party involved - as described in rule 13.1.

Processing
Produce and deliver report.

Data outputs
Breach Report.

8.6 Maintenance of reference data

Sub-process	RF-010 Maintain reference and security data
Process	Maintain reference data
Rule references	Part H rule 6
Dependencies	

Description
<p>The system maintains reference information about users, participants, grid points and other operational information in order to:</p> <ul style="list-style-type: none"> • validate that any information provided is correct and complete; and • ensure only authorized users have access to the system.

Business requirements
<p>The system must maintain information about:</p> <ul style="list-style-type: none"> • valid grid points, the island in which they are located, the island reference points and zone; • generating plants and whether they are part of a block or station dispatch group and whether they are offered by unit or station; • trading period start and end times; • daylight saving times; • participants i.e. their codes and roles generators, ancillary service agent, purchaser, grid owner, system operator, distributor, HVDC owner or a combination of roles; • participant trading information i.e. the grid points at which participants purchase and sell electricity; • participant contact details; and • approved users per participant organisation. <p>The maintenance of reference information must be a supervisor function i.e. restricted to a limited number of personnel.</p> <p>There must be a formal procedure for the approval of all new participants and generating stations, with sign-off from the higher management in a participant's organisation. The process must encompass changes and expiry.</p> <p>There must be a strong audit trail for all maintenance of information.</p> <p>System must incorporate industry standards for the management of passwords and lockouts for unsuccessful attempts.</p>

Data inputs

New reference and security data values.

Processing

Allow the operator with supervisor authority to maintain reference and security data

Data outputs

Updated reference and security data values.

