

# Electricity Commission

## Information system

**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.

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# Revision history

<b>Version</b>	<b>Release date</b>	<b>Description</b>
Draft 1	March 2006	Initial version.
Draft 2	July 2006	Change to front page and some document formatting.

# Wholesale information and trading system functional specification

## 1 Introduction

The Rules refer to the 'information system'. In part A the 'information system' is defined as "the system or systems required for the conveyance of information between persons in accordance with the rules as may be approved from time to time by the Board". Where the Rules require information to be published, the definition in part A of the term 'publish' states that any information published by the board or service providers is to be made available to the intended recipient through the 'information system'.

To date, the board has approved the use of a number of different systems and transfer mechanisms and these taken together constitute the 'information system' in a formal sense. The currently approved systems and transfer mechanisms are given in the document detailed in Appendix I - Information system definition. In practice the 'information system' comprises a number of computer systems belonging to energy sector participants, energy market service providers and the Board, and the connections between them that allow the users of those systems to carry out their duties and responsibilities under the Rules.

## 2 This document

This document describes the responsibilities and functions of that part of the 'information system' concerned with the wholesale trading of energy and reserves, and the publication of related information to and from participants and service providers, as described in parts G and H of the Rules. The document details the data requirements but not the actual file formats.

The expectation is that the service provider responsible for the delivery of the Wholesale Information and Trading System (WITS) will develop relationships with participants and the other service providers, who require

their information to be 'published' under the Rules through the 'information system', with the aim of providing a user interface that will allow participants to access all their relevant information in a seamless manner.

This document also describes the mechanisms that are currently used to transfer and publish the information but these are provided only for completeness sake and do not mean that these are the required mechanisms. The wholesale information and trading system will be required to keep up to date with technological advances to ensure that it delivers its functions efficiently, securely and consistently, and can communicate effectively with participants' systems.

### **3 Overview**

The purpose of WITS is to act as a central facility for the receipt and publication of information between and on behalf of the various parties involved in the wholesale electricity market.

Purchasers and generators send their bids and offers for energy and reserves to WITS, which validates them and sends the valid ones to the system operator for use in their scheduling and dispatch process. When the resulting prices and quantities have been calculated, the system operator sends these to WITS for publication to generators and purchasers.

The pricing manager sends provisional and final prices to WITS for publication to the market.

The clearing manager sends constrained on/off amounts and block settlement differences to WITS for publication to the market. It also sends invoices to WITS for distribution to participants.

WITS itself compiles compliance information and sends it to the Board. It also keeps track of bids and offers throughout the day so that it can publish real-time information and the final bids and offers to the public domain.

### **4 The current environment**

The systems and transfer mechanisms currently approved for use, are owned and operated by a number of service providers and range from bespoke systems to Internet websites to standard e-mail.

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 e-mail and voice, the current systems used are:

<b>Rule role (party responsible)</b>	<b>Rule part</b>	<b>IS system</b>
Board	C, D, E, F G	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

The current wholesale information and trading system is mainly used for the transfer of data files to and from participants and service providers. Other information, usually notices and reports, are published to participants either via e-mail or via the service provider's (and the Board's) own website.

In addition to the transfer and publication of trading information, the long-term objective for WITS is to be the place from where all wholesale market trading information can be accessed by participants, either through inclusion of that information into WITS itself or through links to other service providers' websites.

## 5 Rules references

The rules referenced in this document are contained in the following sections of the Rules:

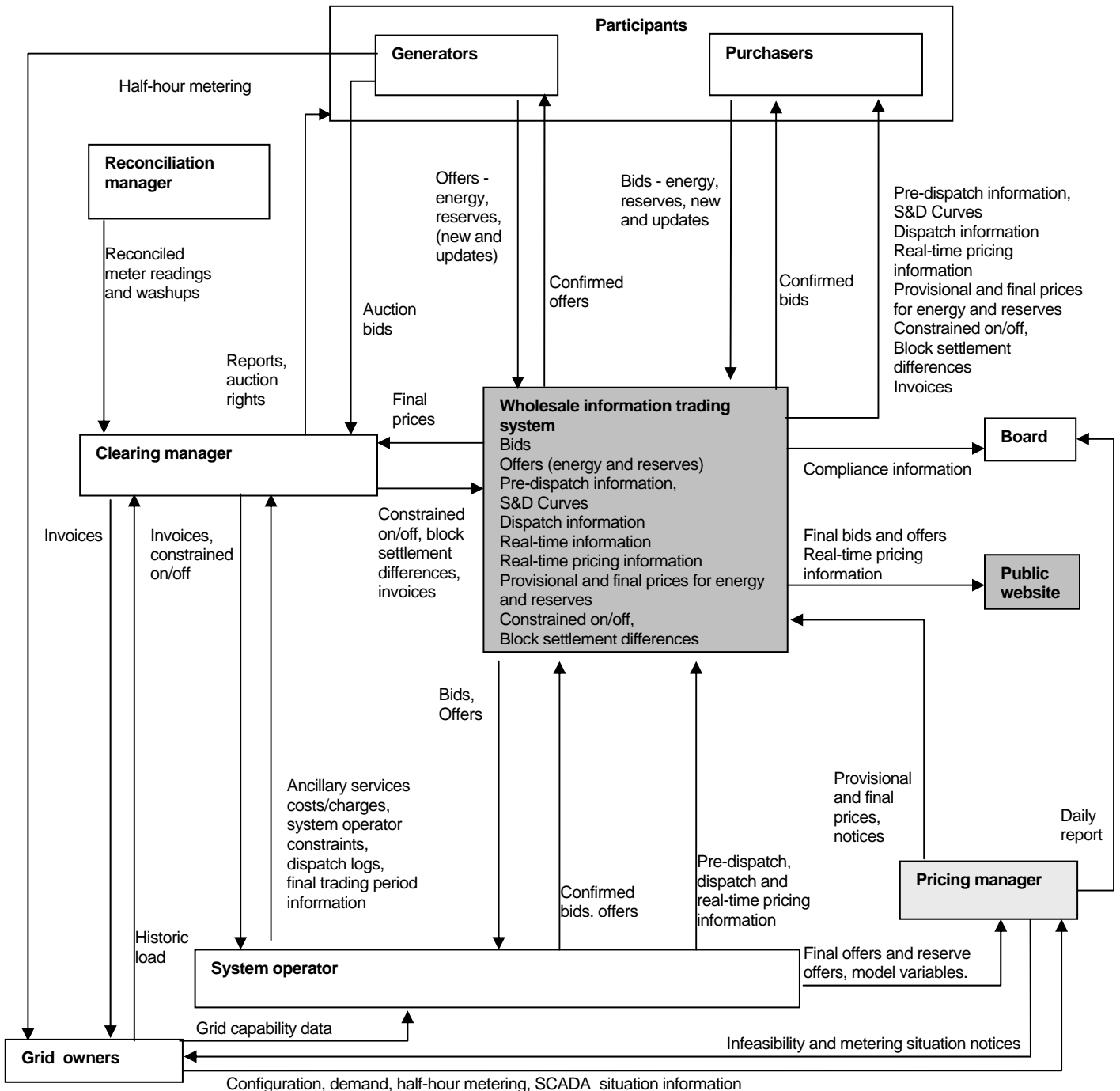
- part C;
- part G; and
- part H

They can be downloaded from [www.electricitycommission.govt.nz](http://www.electricitycommission.govt.nz) .

The version of the Rules used in this document are the draft rules dated the 16th November 2005.

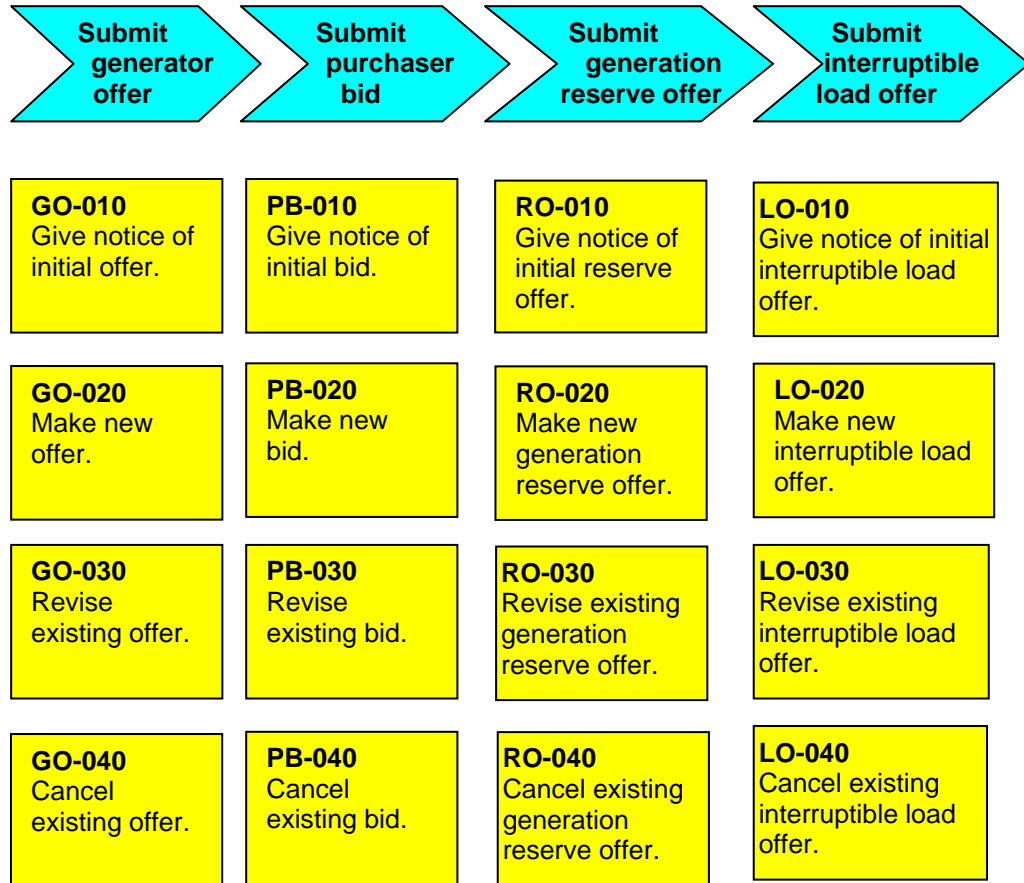
## 6 Current information flows between service providers and participants transferred via the information system

The processes described in this document are concerned with the management of the information flows in and out of the areas in the diagram highlighted in grey.

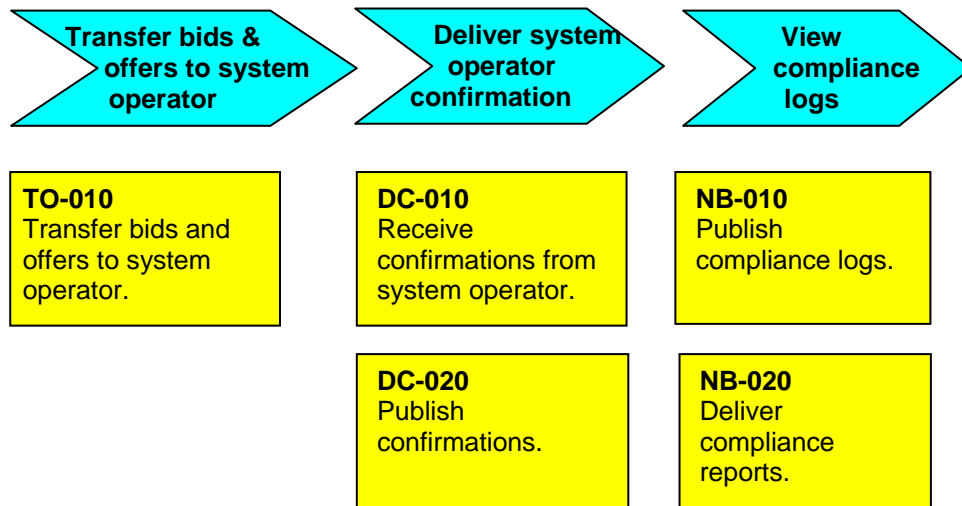


## 7 Process maps

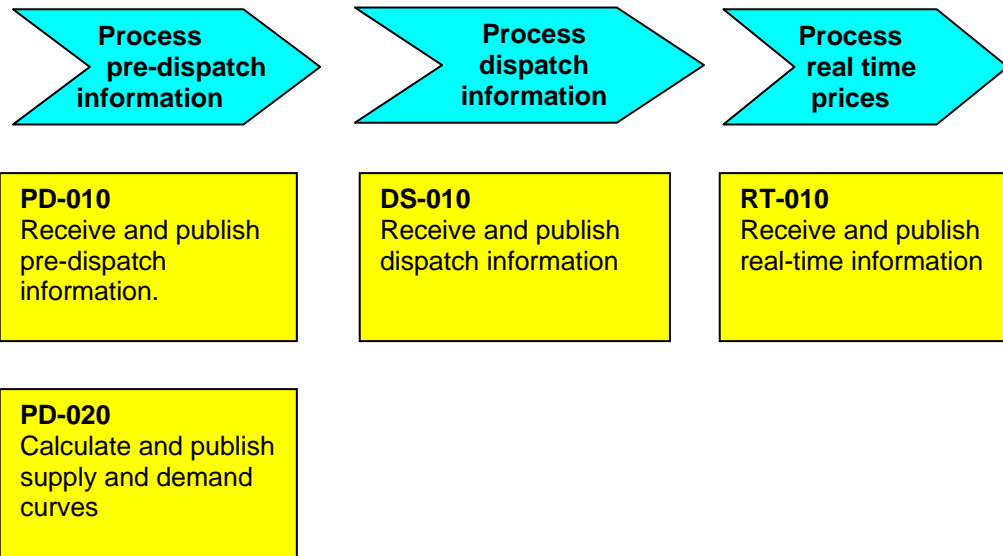
### Process map–bid and offer submission



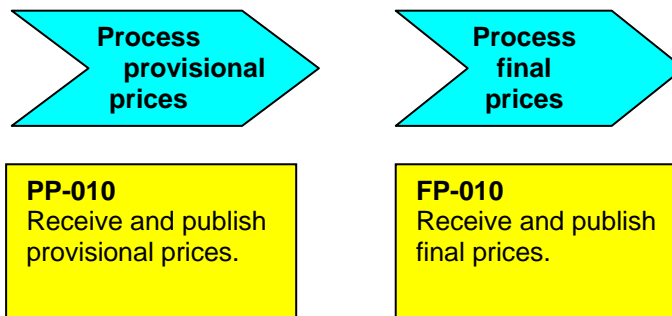
## Process map—bid and offer confirmation



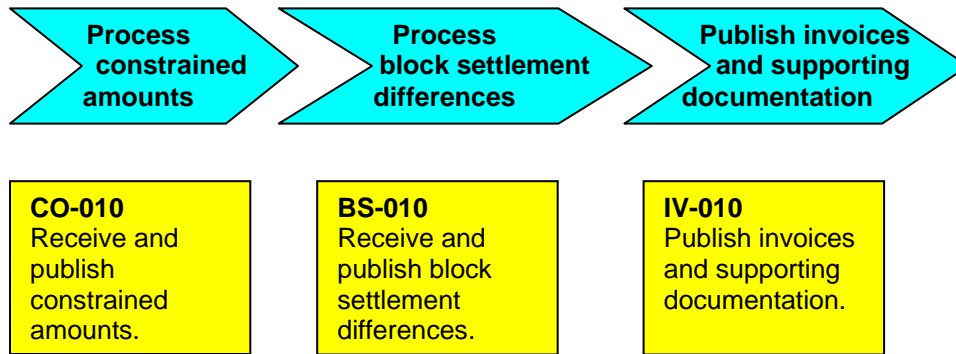
**Process map—publish schedules, prices and related Information from the system operator**



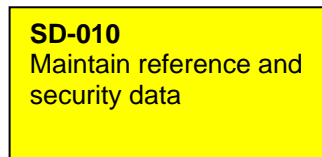
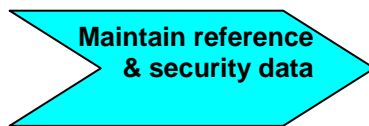
**Process map—publish provisional and final prices from the pricing manager**



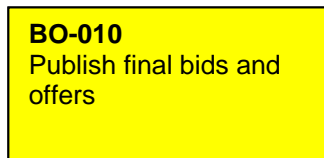
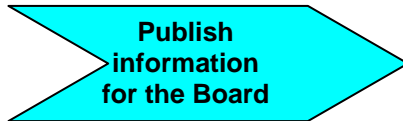
**Process map—publish information from the clearing manager**



## Process map - maintain reference and security data



## Process map—publication of information on behalf of the Board



## 8 Sub processes

### 8.1 Bid and offer submission

Sub process:	<b>GO-010 Give notice of initial offer</b>
Process:	Submit generator offer
Source:	Generators
Destination:	System operator, clearing manager, WITS
Transfer mechanism:	A secure data transfer facility
Rule references:	Part G section II rules 3.2, 3.7 and 3.8 Part G section III rules 3.6, 3.9 and 3.10 Part C section III rule 4.5 Part G schedule G1 forms 1 and 2
Dependencies :	SD-010

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#### Description:

Prior to making their first offer, generators are required notify the system operator of their intention and to provide the system operator with information about their generating plants. This information is also required by the clearing manager and WITS for system setup purposes. The information is to be transmitted to all parties.

#### Business requirements:

1. Provides the generator with the means to transmit the information to the system operator, clearing manager and WITS in a mutually acceptable format.
2. The information must be stored in WITS as part of the reference data used to validate bids and offers. Data input facilities are required (See SD-010). This information will reduce the need to provide some of the information required by the Rules in part G schedule G1 in every offer such as generator name and block name.

#### Processing:

##### System

1. Transmits the information to the system operator, clearing manager and WITS.

Data inputs:

Participant code of generator

Generator Name

Per generating plant:

Generator class - standard, embedded or intermittent.

Generating plant name.

Grid Injection Point.

Whether the offers will be provided by station or unit (intermittent generators cannot offer by unit).

Whether the generating station is part of a block dispatch group (not applicable for intermittent generators).

If offered by unit, the unit number.

If generating station is part of a block, the block name.

Maximum quantity, in MW's, that can be generated in a trading period.

Trading date and trading period of first offer.

For embedded generators, the method of transmitting output information, if not via the standard offer submission processes described in sub-processes GO-020 to GO-040.

N.B. The system operator may require additional information to the above list.

Data outputs:

Information stored as reference data.

Sub process:	<b>GO-020 Make new offer</b>
Process:	Submit generator offer
Source:	Generator
Destination:	System operator
Transfer mechanism:	A secure data transfer facility
Rule references:	Part G section II rules 3.1, 3.5, 3.6, 3.7, 3.8, 3.9, 3.12, 3.13 and 3.21 Part G schedule G1 forms 1 and 2.
Dependencies :	GO-010

<b>Description:</b>
Generators, embedded generators and intermittent generators submit offers to the system operator via WITS.

<b>Business requirements:</b>
<ol style="list-style-type: none"> <li>1. Offers must be submitted to the system operator by 1300 hours on the day prior to the trading day for which the offer applies.</li> <li>2. Offers can only be offered once the approval process has been completed and the reference data relating to the generator and its generating plants has been stored by the system operator, clearing manager and WITS.</li> <li>3. Offers must be "valid till cancelled". If an offer is not made by 1300 hours for any trading period(s) of the following day, the Rules deem that the offers for the current trading day for the missing trading period(s) must be used by the system operator.</li> <li>4. Generators must not be able to offer more than the maximum quantity that can be generated by the generating plant in a trading period (as notified to the system operator in GO-010).</li> <li>5. Generators must be able to offer by unit or by station but only after prior agreement with the system operator (as notified to the system operator in GO-010). Intermittent generators, however, must only be able to offer by station.</li> <li>6. Offers must be able to contain up to 5 price bands for any trading period except for intermittent generators who must only be able to offer one price band i.e. one price and one quantity.</li> <li>7. Prices must be expressed in NZ Dollars and cents i.e. to 2 decimal places per MWh.</li> </ol>

8. The minimum allowable price must be zero. There must be no upper limit except for intermittent generators whose upper limit must be \$0.01 per MWh.
9. The quantity per price band must be expressed in MW and be to 3 decimal places.
10. The minimum allowable quantity must be 0.000 MW.
11. For the first band, the quantity and price must indicate that the offer is "for the first *quantity of MWs* at the first *price per MWh*". For subsequent bands, the offer indicates that it is the price for the " for the **next quantity** of MWs".
12. The total quantity offered in all bands (i.e. the sum of all 5 bands) must not exceed the total quantity that can be generated for the generating plant as stored in the reference data.
13. Prices must increase from band to band i.e. the band 2 price must be more than the band 1 price etc.
14. Trading dates combined with the trading period must not be in the past and must not be for the current trading period.
15. There must be no restriction as to how far in advance of the trading date/trading period an offer can be submitted, however, the system operator only requires offers for the current and next trading dates to be transmitted to them.
16. Offers must remain strictly private and confidential to the organization concerned (and the system operator).
17. participants must only be able to view their own offers.
18. participants must be able to download their own offers into their own systems.
19. All offers must generate an audit trail.

#### Processing:

##### System

1. Validates the offer against validation criteria and reference data.
2. Notifies users of any errors requiring correction.
3. Stores the valid offers and makes them available for viewing and downloading by all permitted users of the participant company.

4. Transmits valid offers for the current and next trading dates immediately to the system operator.

Data inputs:			
Offers contain:			
Information input	Format	Mandatory/optional	Comments
Participant code of generator	Char 4	M	Code allocated by reconciliation manager to 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 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	MW.
Band 1 price	Price	M	
Band 2 quantity	Quantity	O	MW.
Band 2 price	Price	O	
Band 3 quantity	Quantity	O	MW
Band 3 price	Price	O	
Band 4 quantity	Quantity	O	MW
Band 4 price	Price	O	
Band 5 quantity	Quantity	O	MW

Band 5 price	Price	O	
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**Data outputs:**

The same as that input but with the addition of audit information generated by the system that includes:

- the date and time the offer was received;
- details of the user submitting the offer;
- method of submission and filename; and
- the date and time the offer was delivered to the system operator.



Sub Process:	<b>GO-030 Revise existing offer</b>
Process:	Submit generator offer
Source:	Generator
Destination:	System operator
Transfer mechanism:	A secure data transfer facility
Rule references:	Part G section II rules 3.14 to 3.17
Dependencies :	GO-020

**Description:**

Generators, embedded generators and intermittent generators may submit revised offers to the system operator via WITS.

**Business requirements:**

1. Although the Rules part G section II rule 3.16 implies that revisions cannot be made to prices within 2 hours of the trading period commencement (30 minutes for embedded generators), the rules 3.14 3.15 and 3.17 permit revisions within these times under certain circumstances. Therefore the system must permit revisions of offers up to the commencement of the trading period.
2. All revisions within the two hour period prior to the commencement of the trading period and within 30 minutes for embedded generators must be logged for compliance reporting purposes.
3. The same validation and submission process must be used for revised offers as for new offers. The revised offer must replace the existing offer and must be transmitted to the system operator.

**Processing:**

Processing is the same as described in GO-020 with the following additions:

1. revised offers replace any existing offers; and
2. revised offers are logged when they are submitted within two hours of the commencement of the trading period for standard and intermittent generators, and within 30 minutes for embedded generators.

Data inputs:
The same as GO-020:
Data outputs:
The same as GO-020.

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Sub process:	<b>GO-040 Cancel existing offer</b>
Process:	Submit generator offer
Source:	Generator
Destination:	System operator
Transfer mechanism:	A secure data transfer facility
Rule references:	Part G section II rules 3.14 to 3.17
Dependencies :	GO-020

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Description:
Generators, embedded generators and intermittent generators may cancel offers submitted previously to the system operator via WITS.

Business requirements:
<ol style="list-style-type: none"> <li>1. The following two types of cancellation process must be allowed for: <ol style="list-style-type: none"> <li>a) withdrawal of an offer for one or more trading periods; and</li> <li>b) the permanent cessation of trading by the generating plant.</li> </ol> </li> <li>2. In the first case a revised offer for zero quantity and price (in all bands) must be submitted and the process described under sub-process GO-030 followed.</li> <li>3. In the second instance, the participant must submit revised offers at zero price and quantity for all trading periods for one or more trading dates. The number of trading days must be agreed with the system operator to allow time for changes to their systems. Once the required number of trading days has passed, any 'good till cancelled' offers must be removed from WITS and the participant must be prevented from submitting further offers.</li> </ol>

Processing:
Processing is the same as described in GO-020 with the following additions:

1. cancellation offers replace any existing offers; and
2. cancellation offers are logged when they are submitted within two hours of the commencement of the trading period for standard and intermittent generators, and within 30 minutes for embedded generators.

**Data inputs:**

The same as GO-020.

**Data outputs:**

The same as GO-020.

<b>Sub process:</b>	<b>PB-010 Give notice of initial bid</b>
<b>Process:</b>	Submit purchaser bid
<b>Source:</b>	Purchaser
<b>Destination:</b>	System operator, clearing manager, WITS
<b>Transfer mechanism:</b>	A secure data transfer facility
<b>Rule references:</b>	Part G section II rules 3.4 Part G schedule G1 form 3
<b>Dependencies :</b>	

**Description:**

Prior to making their first bid, purchasers notify the system operator of their intention and provide the system operator with information about their proposed trading at grid exit points. This information is also required by the clearing manager and WITS for system setup purposes. The information is to be transmitted to all parties.

**Business requirements:**

1. Provides the purchaser with the means to transmit the information to the system operator, clearing manager and WITS in a mutually acceptable format.
2. The information must be stored in WITS as part of the reference data used to validate bids and offers. Data input facilities are required (See SD-010). This information will reduce the need to provide some of the information required by the Rules in part G schedule G1 in every bid such as purchaser name.

Processing:

System

1. Transmits the information to the system operator, clearing manager and WITS.

Data inputs:

Participant code of purchaser

Generator name

Per grid exit point

Trading date and trading period of first bid

N.B. The system operator may require additional information to the above.

Data outputs:

Information stored as reference data.

Sub process:	<b>PB-020 Make new bid</b>
Process:	Submit purchaser bid
Source:	Purchaser
Destination:	System operator
Transfer mechanism:	A secure data transfer facility
Rule references:	Part G section II rules 3.3, 3.5, 3.10 to 3.13 and 3.21 Part G schedule G1 form 3.
Dependencies :	PB-010

Description:
Purchasers submit bids to the system operator via WITS.

Business requirements:
<ol style="list-style-type: none"> <li>1. Bids must be submitted to the system operator by 1300 hours on the day prior to the trading day for which the bid applies.</li> <li>2. Bids must only be submitted once the approval process has been completed and the reference data relating to the purchaser and their grid exit points has been stored.</li> <li>3. Bids must be "valid till cancelled". If a bid is not made by 1300 hours for any trading period(s) of the following day, the Rules deem that the bids for the current trading day for the missing trading period(s) are to be used by the system operator.</li> <li>4. Bids must be able to contain up to 10 price bands for any trading period.</li> <li>5. Prices must be expressed in NZ Dollars and cents to 2 decimal places and per MWh.</li> <li>6. The minimum acceptable price must be zero. There must be no upper limit.</li> <li>7. The quantity per price band must be expressed in MW to 3 decimal places.</li> <li>8. The minimum acceptable quantity must be 0.000 MW.</li> <li>9. For the first band, the quantity and price must indicate that the bid is "for the first <i>quantity</i> of MWs at the first <i>price</i> per MWh". For subsequent bands, the bid indicates that it is the price for the " for the <b>next</b> <i>quantity</i> of MWs".</li> <li>10. Prices must decrease from band to band i.e. band 1 price must be more than band 2 price etc.</li> <li>11. Trading dates combined with the trading period must not be in the past and</li> </ol>

must not be for the current trading period.

12. There must be no restriction as to how far in advance of the trading date/trading period a bid can be submitted. However, the system operator only requires bids for the current and next trading dates to be transmitted to them.
13. Bids must be strictly private and confidential to the organisation concerned (and the system operator).
14. participants must only be able view their own bids.
15. participants must be able to download their own bids into their own systems.
16. All bids must generate an audit trail.

**Processing:**

**System**

1. Validates the bid against validation criteria and reference data.
2. Notifies users of any errors for correction.
3. Stores the valid bids, adds audit information and makes the stored information available to be viewed and downloaded by all permitted users of the participant company.
4. Transmits valid bids for the current and next trading dates immediately to the system operator.

**Data inputs:**

**Bids contain:**

<b>Information Input</b>	<b>Format</b>	<b>Mandatory/optional</b>	<b>Comments</b>
Participant code of purchaser	Char 4	M	Code allocated by reconciliation manager to participant.
Grid exit point	Char 7	M	
Trading sate	Date	M	Trading sate to which the bid applies (DD/MM/YYYY)
Trading period	Numeric 2	M	Trading period to which the bid applies. 1 to 48 for standard day

			1 to 50 for daylight saving end 1 to 46 for daylight saving start
Band 1 quantity	Quantity	M	MW.
Band 1 price	Price	M	
Band 2 quantity	Quantity	O	MW.
Band 2 price	Price	O	
Band 3 quantity	Quantity	O	MW
Band 3 price	Price	O	
Band 4 quantity	Quantity	O	MW
Band 4 price	Price	O	
Band 5 quantity	Quantity	O	MW
Band 5 price	Price	O	
Band 6 quantity	Quantity	M	MW.
Band 6 price	Price	M	
Band 7 quantity	Quantity	O	MW.
Band 7 price	Price	O	
Band 8 quantity	Quantity	O	MW
Band 8 price	Price	O	
Band 9 quantity	Quantity	O	MW
Band 9 price	Price	O	
Band 10 quantity	Quantity	O	MW
Band 10 price	Price	O	

**Data outputs:**

The same as that input but with the addition of audit information generated by the system that includes:

- the date and time the bid was received;
- details of the user submitting the bid;
- method of submission and filename; and
- the date and time the bid was delivered to the system operator.

Sub process:	<b>PB-030 Revise existing bid</b>
Process:	Submit purchaser bid
Source:	Purchaser
Destination:	System operator
Transfer mechanism:	A secure data transfer facility
Rule references:	Part G section II rules 3.14 to 3.17
Dependencies :	PB-020

**Description:**

Purchasers, embedded purchasers and intermittent purchasers may submit revised bids to the system operator via WITS.

**Business requirements:**

1. Although the Rules part G section II rule 3.16 implies that revisions cannot be made to prices within 2 hours of the trading period commencement (30 minutes for embedded generators), the rules 3.14 , 3.15 and 3.17 permit revisions within these times under certain circumstances. Therefore the system must permit revisions of bids up to the commencement of the trading period.
2. All revisions within the two hour period prior to the commencement of the trading period must be logged for compliance reporting purposes.
3. The same validation and submission process must be used for revised bids as for new bids. The revised bid must replace the existing bid and must be submitted to the system operator.

**Processing:**

Processing is the same as described in PB-020 with the following additions:

1. revised bids replace any existing bids; and
2. revised bids are logged when they are submitted within two hours of the commencement of the trading period.

**Data inputs:**

The same as that for PB-020

<b>Data outputs:</b>
The same as that for PB-020

<b>Sub process:</b>	<b>PB-040 Cancel existing bid</b>
<b>Process:</b>	Submit purchaser bid
<b>Source:</b>	Purchaser
<b>Destination:</b>	System operator
<b>Transfer mechanism:</b>	A secure data transfer facility
<b>Rule references:</b>	Part G section II rules 3.4 to 3.17
<b>Dependencies :</b>	PB-020

<b>Description:</b>
Purchasers may cancel bids submitted previously to the system operator via WITS.

<b>Business requirements:</b>
<ol style="list-style-type: none"> <li>1. The following two types of cancellation process must be accommodated: <ol style="list-style-type: none"> <li>a) withdrawal of a bid for one or more trading periods; and</li> <li>b) the permanent cessation of trading by a purchaser at a GXP.</li> </ol> </li> <li>2. In the first case a revised bid for zero quantity and price (in all bands) must be submitted and the process described under sub-process PB-030 followed.</li> <li>3. In the second instance, the participant must submit revised bids at zero price and quantity for all trading periods for one or more trading dates. The number of trading days must be agreed with the system operator to allow time for changes to their systems. Once the required number of trading days has passed, any 'good till cancelled' bids must be removed from the Information System and the participant must not submit any further bids.</li> </ol>

<b>Processing:</b>
Processing is the same as described in PB-020 with the following additions: <ol style="list-style-type: none"> <li>1. cancellation bids replace any existing bids; and</li> <li>2. cancellation bids are logged when they are submitted within two hours of the commencement of the trading period.</li> </ol>

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---

Data inputs:

Same as that for PB-020.

Data outputs:

Same as that for PB-020.

---

Sub process:	<b>RO-010 Give notice of initial generation reserve offer</b>
Process:	Submit generation reserve offer
Source:	Ancillary service agents
Destination:	System operator, clearing manager, WITS
Transfer mechanism:	A secure data transfer facility
Rule references:	Part G section II rules 6.1, 6.3, 6.4, 6.5 Part G section III rule 3.9 and 3.10 Part G Schedule G1 Form 4
Dependencies :	

<b>Description:</b>
Prior to making their first generation reserve offer, ancillary service agents are required to have a contract with the system operator. This information is also required by the clearing manager and WITS for system setup purposes. The information is to be transmitted to all parties.

<b>Business requirements:</b>
<ol style="list-style-type: none"> <li>1. Provides the ancillary service agent with the means to transmit the information to the system operator, clearing manager and WITS in a mutually acceptable format.</li> <li>2. The information must be stored in WITS as part of the reference data used to validate generator reserve offers. Data input facilities are required (see SD-010). This information will reduce the need to provide some of the information required by the Rules in part G schedule G1 in every generator reserve offer.</li> </ol>

<b>Processing:</b>
System
<ol style="list-style-type: none"> <li>1. Transmits the information to the system operator, clearing manager and WITS.</li> </ol>

<b>Data inputs:</b>
Participant code of ancillary service agent
Ancillary service agent
Per generating plant

Generating plant name  
Grid injection point (GIP)  
Whether the offers will be provided by station or unit  
If offered by unit, the unit number  
Trading date and trading period of first offer  
Maximum capability of partly loaded spinning reserve for fast response (6 seconds) in MWs  
Maximum capability of partly loaded spinning reserve for sustained response (60 seconds) in MWs  
Maximum capability of tail water depressed reserve for fast response (6 seconds) in MWs  
Maximum capability of tail water depressed reserve for sustained response (60 seconds) in MWs  
Maximum capability of generator effective reserve capacity for fast response (6 seconds) in MWs  
Maximum capability of generator effective reserve capacity for sustained response (60 seconds) in MWs

N.B The system operator may require additional information to the above.

---

Data outputs:

Information is stored as reference data.

---

Sub process:	<b>RO-020 Make new generation reserve offer</b>
Process:	Submit generation reserve offer
Source:	Ancillary service agent
Destination:	System operator
Transfer mechanism:	A secure data transfer facility
Rule references:	Part G section II rules 6.2, 6.3, 6.4, 6.7, 6.8, 6.10, 6.13, 6.14 and 6.19 Part G Schedule G1 Form 4.
Dependencies :	RO-010

<b>Description:</b>
<p>Ancillary service agents are required to submit generation reserve offers to the system operator through WITS. Generation reserve offers are for partly loaded spinning reserves and/or tail water depressed reserves.</p> <p>Assumptions to be clarified with the Commission: Generation reserve offers must be treated as "valid till cancelled" in the same way as energy offers even though there is no specific rule for reserves.</p>

<b>Business requirements:</b>
<ol style="list-style-type: none"> <li>1. Generation reserve offers must be submitted to the system operator by 1300 hours on the day prior to the trading day for which the offer applies.</li> <li>2. Generation reserve offers must only be submitted once there is a contract in place and the reference data relating to the ancillary service agent generator and its generating plants has been stored.</li> <li>3. It must be possible to submit generation reserve offers for either partly loaded spinning reserve or tail water depressed or both.</li> <li>4. Generation reserve offers must be treated as "valid till cancelled" in the same way as energy offers even though there is no specific rule for reserves.</li> <li>5. Ancillary service agents must offer by unit or by station but only after prior agreement with the system operator (as notified to the system operator in RO-010).</li> <li>6. Generation reserve offers must allow up to 3 price bands for each type of instantaneous reserve (partly loaded spinning reserves and tail water depressed spinning reserves), for fast and sustained response, and for any</li> </ol>

trading period.

7. Prices must be expressed in NZ Dollars and cents to 2 decimal places and per MW.
8. The minimum price must be zero and there must be no upper limit.
9. For partly loaded spinning reserve offers, the quantity in each price band must be expressed as a percentage of electricity output up to a specific maximum. The percentage must be expressed to one decimal place. The maximum must be expressed in MWs to 3 decimal places. The lowest maximum quantity must be 0.001 MW.
10. For tail water depressed reserve offers, the quantity in each price band must be expressed as a maximum quantity expressed in MWs to 3 decimal places. The lowest maximum quantity must 0.001 MW.
11. The quantity in band 2 must indicate that it is additional to the quantity given in band 1. Likewise, the band 3 quantity must be regarded as additional to the quantities given in band 1 and band 2.
12. Prices must increase from band to band i.e. the band 2 price must be more than the band 1 price etc.
13. Trading dates combined with the trading period must not be in the past and must not be for the current trading period.
14. There must be no restriction as to how far in advance of the trading date/trading period an offer can be submitted. However, the system operator only requires offers for the current and next trading dates to be transmitted to them.
15. Generation reserve offers must be strictly private and confidential to the organization concerned (and to the system operator). Participants must only be able to view their own offers.
16. Participants must be able to download their own generation reserve offers into their own systems.
17. All reserve offers must generate an audit trail.

#### Processing:

##### System

1. Validates the offer against the validation criteria and reference data.
2. Notifies users of any errors requiring correction.

3. Stores the valid generation reserve offers and makes them available to be viewed and downloaded by all permitted users of the participant company.
4. Transmits valid reserve offers for the current and next trading dates immediately to the system operator.

Data inputs:			
Generation reserve offers contain:			
Information Input	Format	Mandatory/ optional	Comments
Participant code of generator	Char 4	M	Code allocated by reconciliation manager to 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 1 to 50 for daylight saving end 1 to 46 for daylight saving start
PLSR band 1 percentage - fast response	Percentage	O	
PLSR band 1 maximum quantity - fast response	Quantity	O	MW
PLSR band 1 price - fast response	Price	O	
PLSR band 1 percentage - sustained response	Percentage	O	
PLSR band 1 maximum quantity - sustained response	Quantity	O	MW
PLSR band 1 price - sustained response	Price	O	
PLSR band 2 percentage - fast response	Percentage	O	
PLSR band 2 maximum quantity - fast response	Quantity	O	MW

PLSR band 2 price - fast response	Price	O	
PLSR band 2 percentage - sustained response	Percentage	O	
PLSR band 2 maximum quantity - sustained response	Quantity	O	MW
PLSR band 2 price - sustained response	Price	O	
PLSR band 3 percentage - fast response	Percentage	O	
PLSR band 3 maximum quantity - fast response	Quantity	O	MW
PLSR band 3 price - fast response	Price	O	
PLSR band 3 percentage - sustained response	Percentage	O	
PLSR band 3 maximum quantity - sustained response	Quantity	O	MW
PLSR band 3 price - sustained response	Price	O	
TWD band 1 maximum quantity - fast response	Quantity	O	MW
TWD band 1 price - fast response	Price	O	
TWD band 1 maximum quantity - sustained response	Quantity	O	MW
TWD band 1 price - sustained response	Price	O	
TWD band 2 maximum quantity - fast response	Quantity	O	MW
TWD band 2 price - fast response	Price	O	
TWD band 2 maximum quantity - sustained response	Quantity	O	MW
TWD band 2 price - sustained response	Price	O	
TWD band 3 maximum quantity - fast response	Quantity	O	MW
TWD band 3 price - fast response	Price	O	
TWD band 3 maximum	Quantity	O	MW

quantity - sustained response			
TWD band 3 price - sustained response	Price	0	

---

**Data outputs:**

The same as that input but with the addition of audit information generated by the system that includes:

- the date and time the reserve offer was received;
  - details of the user submitting the reserve offer;
  - method of submission and filename; and
  - the date and time the reserve offer was delivered to the system operator.
-

Sub process:	<b>RO-030 Revise existing generation reserve offer</b>
Process:	Submit generation reserve offer
Source:	Ancillary service agent
Destination:	System operator
Transfer mechanism:	A secure data transfer facility
Rule references:	Part G section II rules 6.12, 6.13 and 6.14
Dependencies :	RO-020

**Description:**

Ancillary service agents may submit revised generation reserve offers to the system operator via WITS.

**Business requirements:**

1. Although the Rules part G section II rules 6.12 and 6.13 implies that revisions cannot be made within 2 hours of the trading period commencement (30 minutes for embedded purchasers), the subsequent rule 6.14 allows for revisions within these times under certain circumstances. Therefore the system must permit revisions of bids up to the commencement of the trading period.
2. All revisions within the two hour period prior to the commencement of the trading period and within 30 minutes for embedded generating stations must be logged for compliance reporting purposes.
3. The same validation and submission process must be used for revised generation reserve offers as for new generation reserve offers. The revised generation reserve offer must replace the existing one and must be submitted to the system operator.

**Processing:**

Processing is the same as described in RO-020 with the following additions:

1. Revised reserve offers replace any existing reserve offers,
2. Revised reserve offers are logged when they are submitted within two hours of the commencement of the trading period for standard and intermittent generators, and within 30 minutes for embedded generators.

Data inputs:
The same as that for RO-020.
Data outputs:
The same as that for RO-020.



Sub process:	<b>RO-040 Cancel existing generation reserve offer</b>
Process:	Submit generation reserve offer
Source:	Ancillary service agent
Destination:	System operator
Transfer mechanism:	A secure data transfer facility
Rule references:	Part G section II rules 6.12, 6.13 and 6.14
Dependencies :	RO-020

**Description:**

An ancillary service agent cancels their existing generation reserve offers submitted previously to the system operator via WITS.

**Business requirements:**

1. The system must cater for the following two types of cancellation process:
  - a) withdrawal of an offer for one or more trading periods; and
  - b) the permanent cessation of trading by the generating plant.
2. In the first case, a revised generation reserve offer for zero quantity and price (in all bands), for one or both types of instantaneous reserve, must be submitted and the process described under sub-process RO-030 followed.
3. In the second instance, the participant must submit revised generation reserve offers at zero price and quantity for all trading periods for one or more trading dates. The number of trading days must be agreed with the system operator to allow time for changes to their systems. Once the required number of trading days has passed, any 'good till cancelled' offers must be removed from WITS and the participant prevented from submitting further generation reserve offers.

**Processing:**

Processing is the same as described in RO-020 with the following additions:

1. cancellation reserve offers replace any existing offers; and
2. cancellation reserve offers are logged when they are submitted within two hours of the commencement of the trading period for standard and intermittent generators, and within 30 minutes for embedded generators.

Data inputs:

The same as for RO-020.

Data outputs:

The same as for RO-020.

---

Sub process:	<b>LO-010 Give notice of initial interruptible load reserve offer</b>
Process:	Submit interruptible load reserve offer
Source:	Ancillary service agents
Destination:	System operator, clearing manager, WITS
Transfer mechanism:	A secure data transfer facility
Rule references:	Part G section II rules 6.1, 6.2, 6.3.2 Part G section III rule 3.9 Part G Schedule G1 Form 5
Dependencies :	

**Description:**

Prior to making their first interruptible load reserve offer, ancillary service agents are required to have a contract with the system operator. This information is also required by the clearing manager and WITS for system setup purposes. The information is to be transmitted to all relevant parties

**Business requirements:**

1. Provides the ancillary service agent with the means to transmit the information to the system operator, clearing manager and WITS in a mutually acceptable format.
2. The information must be stored in WITS as part of the reference data used to validate interruptible load reserve offers. Data input facilities are required (See SD-010). This information will reduce the need to provide some of the information required by the Rules in part G Schedule G1 in every interruptible load reserve offer.

**Processing:**

System

1. Transmits the information to the system operator, clearing manager and WITS.

**Data inputs:**

Participant code of ancillary service agent (who will also be a purchaser)  
Ancillary service agent full name  
Per Grid Exit Point (GXP) or interruptible load group GXP:

Trading date and trading period of first offer  
Availability of fast response (in 6 seconds)  
Availability of sustained response (in 60 seconds)

N.B. The system operator may require additional information to the above.

---

Data outputs:

Information stored as reference data.

---

Sub process:	<b>LO-020 Make new interruptible load reserve offer</b>
Process:	Submit interruptible load reserve offer
Source:	Ancillary service agent
Destination:	System operator
Transfer mechanism:	A secure data transfer facility
Rule references:	Part G section II rules 6.2, 6.3.2,6.6, 6.7, 6.8, 6.9, 6.10, 6.13, 6.14 and 6.19 Part G Schedule G1 Form 5.
Dependencies :	LO-010

**Description:**

An ancillary service agent submits interruptible load reserve offers to the system operator via WITS.

Assumptions to be clarified with the Commission:

Interruptible load reserve offers must be treated as "valid till cancelled" in the same way as energy offers even though there is no specific rule for reserves.

The minimum price must be zero (even though the rule 6.9 says there is no lower limit) and there must be no upper limit. However in practical terms there must be an upper limit.

The quantity in each price band must be expressed as a maximum to 3 decimal places. The minimum quantity must be 0.001 MW even though there is no specific rule that states this.

**Business requirements:**

1. Interruptible load reserve offers must be submitted to the system operator by 1300 hours on the day prior to the trading day for which the offer applies.
2. Interruptible load reserve offers must only be offered once there is a contract in place and the reference data relating to the ancillary service agent's reserves GXPs or interruptible load group GXPs stored.
3. Interruptible load reserve offers must be treated as "valid till cancelled" in the same way as energy offers even though there is no specific rule for reserves. See GO-020.
4. Interruptible load reserve offers must contain no more than 3 price for fast and sustained response and per trading period.
5. Prices must be expressed in NZ Dollars and cents to 2 decimal places and

per MW.

6. The minimum price must be zero (even though the rule 6.9 say no lower limit) and there must be no upper limit. However in practical terms there must be an upper limit.
7. The quantity in each price band must be expressed as a maximum to 3 decimal places. The minimum quantity must be 0.001 MW though there is no specific rule that states this.
8. Prices must increase from band to band i.e. the band 2 price must be more than the band 1 price etc.
9. Trading dates combined with the trading period must not be in the past and must not be for the current trading period.
10. There must be no restriction as to how far in advance of the trading date/trading period an offer can be submitted. However, the system operator only requires offers for the current and next trading dates to be transmitted to them.
11. Interruptible load reserve offers must be strictly private and confidential to the organization concerned (and the system operator). Participants must only be able to view their own offers.
12. participants must be able download their own interruptible load reserve offers into their own systems.
13. All interruptible load reserve offers must generate an audit trail.

#### Processing:

##### System

1. Validates the interruptible load reserve offers against validation criteria and reference data.
2. Notifies users of any errors requiring correction.
3. Stores the valid interruptible load reserve offers in the system and makes them available to be viewed and downloaded by all permitted users of the participant company.
4. Transmits valid interruptible load reserve offers for the current and next trading dates immediately to the system operator.

Data inputs:			
Interruptible load reserve offers contain:			
Information Input	Format	Mandatory/ optional	Comments
Participant code	Char 4	M	Code allocated by reconciliation manager to participant.
Grid exit point or interruptible load group GXP	Char 7	M	
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 1 to 50 for daylight saving end 1 to 46 for daylight saving start
Band 1 maximum quantity - fast response	Quantity	O	MW
Band 1 price - fast response	Price	O	
Band 1 maximum quantity - sustained response	Quantity	O	MW
Band 1 price - sustained response	Price	O	
Band 2 maximum quantity - fast response	Quantity	O	MW
Band 2 price - fast response	Price	O	
Band 2 maximum quantity - sustained response	Quantity	O	MW
Band 2 price - sustained response	Price	O	
Band 3 maximum quantity - fast response	Quantity	O	MW
Band 3 price - fast response	Price	O	
Band 3 maximum quantity - sustained response	Quantity	O	MW
Band 3 price - sustained response	Price	O	

Data outputs:

The same as that input but with the addition of audit information generated by the system that includes:

- the date and time the reserve offer was received;
  - details of the user submitting the reserve offer;
  - method of submission and filename; and
  - the date and time the reserve offer was delivered to the system operator.
-

Sub process:	<b>LO-030 Revise existing interruptible load reserve offer</b>
Process:	Submit interruptible load reserve offer
Source:	Ancillary service agent
Destination:	System operator
Transfer mechanism:	A secure data transfer facility
Rule references:	Part G section II rules 6.12, 6.13 and 6.14
Dependencies :	LO-020

**Description:**

An ancillary service agent may submit revised interruptible load reserve offers to the system operator via WITS.

**Business requirements:**

1. Although the Rules part G section II rule 6.13 implies that revisions cannot be made within 2 hours of the trading period commencement of the trading period, the subsequent rule 6.14 allows for revisions within the two hours under certain circumstances. Therefore the system must permit revisions of interruptible load reserve offers up to the commencement of the trading period.
2. All revisions within the two hour period prior to the commencement of the trading period must be logged for compliance reporting purposes.
3. The same validation and submission process must be used for revised interruptible load reserve offers as for new ones as described in sub-process GO-020. The revised interruptible load reserve offer must replace the existing offer and must be submitted to the system operator.

**Processing:**

Processing is the same as described in LO-020 with the following additions:

1. revised reserve offers replace any existing reserve offers; and
2. revised reserve offers are logged when they are submitted within two hours of the commencement of the trading period.

Data inputs:
The same as for LO-020.
Data outputs:
The same as for LO-020.



Sub process:	<b>LO-040 Cancel existing offer</b>
Process:	Submit interruptible load reserve offer
Source:	Ancillary service agent
Destination:	System operator
Transfer mechanism:	A secure data transfer facility
Rule references:	Part G section II rules 6.12, 6.13 and 6.14
Dependencies :	LO-020

#### Description:

An ancillary service agent cancels their existing interruptible load reserve offers submitted previously to the system operator via WITS.

#### Business requirements:

1. There are two types of cancellation process that must be catered for:
  - withdrawal of an offer for one or more trading periods; and
  - the permanent cessation of trading by the generating plant.
2. In the first case, a revised interruptible load reserve offer for zero quantity and price (in all bands), for one or both types of instantaneous reserve, must be submitted and the process described under sub-process LO-030 followed.
3. In the second instance, the participant must submit revised interruptible load reserve offers at zero price and quantity for all trading periods for one or more trading dates. The number of trading days must be agreed with the system operator to allow time for changes to their systems. Once the required number of trading days has passed, any 'good till cancelled' interruptible load reserve offers must be removed from WITS and the participant prevented from submitting any more interruptible load reserve offers.

#### Processing:

Processing is the same as described in LO-020 with the following additions:

1. cancellation reserve offers replace any existing reserve offers; and
2. revised reserve offers are logged when they are submitted within two hours of the commencement of the trading period.

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Data inputs:
The same as for LO-020.

Data outputs:
The same as LO-020.

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## 8.2 Bid and offer confirmation

Sub process:	<b>TO-010 Transfer bids and offers to system operator</b>
Process:	Transfer bids and offers to system operator
Source:	WITS
Destination:	System operator
Transfer mechanism:	A secure fast data transfer facility
Rule references:	
Dependencies :	Bid and offer submission process

---

### Description:

WITS transmits trading information (new, revised and cancelled bids and offers for energy and all types of reserves) to the system operator.

### Business requirements:

1. Each bid, offer and reserves offer must be transferred to the system operator's system immediately it has successfully passed all validation checks.
2. The format of the data and transfer mechanism must first be mutually agreed between the WITS service provider and the system operator.
3. The response time for each transfer must be sub-second.

### Processing:

#### System

1. Transmits unprocessed valid bids, offers and reserve offers are sent to the system operator recording the date and time sent.

### Data inputs:

Unprocessed bids, offers and reserve offers.

### Data outputs:

Unprocessed bids, offers and reserve offers with audit information of time sent.

---

Sub process:	<b>DC-010 Receive confirmation from system operator</b>
Process:	Deliver system operator confirmation
Source:	System operator
Destination:	WITS
Transfer mechanism:	A secure fast data transfer facility
Rule references:	Part G section II rules 3.22, 6.20
Dependencies :	TO-010

#### Description:

The system operator transmits confirmation of the receipt of the bids, offers and all types of reserve offers to WITS.

#### Business requirements:

1. Confirmation information for each (new, revised or cancelled) bid, offer and reserves offer received by the system operator must be sent to WITS immediately it has received the information.
2. The format of the data and transfer mechanism must first be mutually agreed by the service provider and the system operator.
3. Confirmations must include:
  - copy of the bid, offer or reserve offer;
  - error reason if the system operator is unable to accept the bid, offer or reserve offer;
  - date and time stamp of receipt by system operator; and
  - date and time of receipt of confirmation by WITS.
4. The response time for the transfer must be sub-second.

#### Processing:

##### System

1. Receives the confirmation details sent to it by the system operator and stores them for viewing by participants.

#### Data inputs:

Confirmed bids, offers or reserve offers (new, revised or cancelled)

---

Data outputs:

---

Sub process:	<b>DC-020 View confirmations</b>
Process:	Deliver system operator confirmation
Source:	WITS
Destination:	Participants
Transfer mechanism:	Online display and file download facility
Rule references:	Part G section II rules 3.22, 3.23, 6.20 and 6.21
Dependencies :	DC-010

**Description:**

A participant checks whether a confirmation of their bids, offers or reserves offers has been received from the system operator.

**Business requirements:**

1. Confirmation information for each bid, offer and reserves offer received from the system operator must be viewable from WITS immediately it arrives.

**Processing:**

System

1. Retrieves and displays the confirmations or errors received from the system operator for the bids, offers or reserves offers selected by the user.

**Data inputs:**

The participant's selection criteria of which bids, offers or reserves offers to check for confirmation.

**Data outputs:**

Copy of the bid, offer or reserve offer.

Processing status (*confirmed* or *error*).

If the processing status is *error* then the reason for that error.

Date and time stamp of the receipt of the unprocessed bid, offer or reserve offer by the system operator.

Date and time stamp of the receipt of the confirmation by WITS.

Date and time stamp WITS received the bid, offer or reserve offer from the user.

Sub process:	<b>NB-010 Publish compliance logs</b>
Process:	View compliance logs
Source:	WITS
Destination:	Participants
Transfer mechanism:	Online display and file download facility
Rule references:	
Dependencies :	Bid and offer submission process

---

<b>Description:</b>
A participant reviews their own compliance logs held in WITS either online and/or via file transfer.

<b>Business requirements:</b>
<ol style="list-style-type: none"> <li>Participants must only be able to view and download their own company's compliance logs not those of others.</li> </ol>

<b>Processing:</b>
System
<ol style="list-style-type: none"> <li>Finds the compliance logs selected by the participant.</li> <li>Makes them available for display online and download.</li> </ol>

<b>Data inputs:</b>
Participant's selection criteria.

<b>Data outputs:</b>
<p>Copy of each bid, offer or reserve offer logged.</p> <p>Audit information (particularly submission date timestamp).</p> <p>Details of what information was changed (price and/or quantity).</p> <p>Whether the submitter was an embedded generator.</p>

---

Sub process:	<b>NB-020 Deliver compliance reports</b>
Process:	View compliance logs
Source:	WITS
Destination:	Board
Transfer mechanism:	Email
Rule references:	Part G section II rules 3.20 and 6.18
Dependencies :	Bid and Offer Submission Process

---

**Description:**

WITS lists the compliance logs daily and delivers them to the Board or their compliance representative.

**Business requirements:**

1. All compliance logs must be delivered to the appropriate party daily. Ideally compliance personnel should have access to the same compliance logs as participants as described in NB-010.
2. The format of the report, retention period of the compliance logs and the medium of transmission must be agreed with the Board.

**Processing:**

The system generates reports or provides online access to compliance personnel of the compliance logs.

**Data inputs:**

Compliance logs of all participants.

**Data outputs:**

A compliance report that contains for each affected participant:

- copy of each bid, offer or reserve offer logged;
  - audit information (particularly submission date timestamp);
  - details of what information was changed (price and/or quantity); and
  - whether the submitter was an embedded generator or not.
-

### 8.3 Publish schedules, prices and related information from the system operator

Sub process:	<b>PD-010 Receive and publish pre-dispatch Information</b>
Process:	Receive and publish pre-dispatch Information
Source:	System operator
Destination:	Participants
Transfer mechanism:	A secure fast data transfer facility
Rule references:	Part G section III rule 10 and 10.5
Dependencies :	

#### Description:

WITS publishes the pre-dispatch information that it receives from the system operator immediately it is received (approximately every two hours).

Some of the information is confidential to the participant concerned and some applies to the market as a whole and is published for access by all participants.

N.B. On any day, the pre-dispatch schedules calculated prior to 1300 hours cover the remaining trading periods of the current day only. For pre-dispatch schedules calculated after 1300 hours, they **also** cover all the trading periods for the next day.

#### Business requirements:

1. Pre-dispatch information from the system operator must be published immediately whenever it is received.
2. Pre-dispatch information must be published both online and in batch mode.
3. Those parts of the pre-dispatch information which are confidential to individual participants must only be accessible by those participants.
4. The system operator and the service provider must agree on the format and the mechanism for the transfer of pre-dispatch information provided by the former to the latter.

#### Processing:

##### System

1. Receives the pre-dispatch information from the system operator.
2. Selects and publishes the information according to whether it is confidential

to individual participants or available to all participants.

3. Publishes both the confidential and non-confidential information online and in batch mode.

#### Data inputs:

Confidential pre-dispatch information for each participant for each trading period in the pre-dispatch schedule.

1. A schedule of the expected average level of electricity output by each generating plant.
2. A schedule of the expected average level of instantaneous reserve.
3. A schedule of the expected average level of demand at each grid exit point.

Non-confidential information for each trading period in the pre-dispatch schedule period.

1. Forecast prices for energy at each grid injection point, grid exit point and the reference points.
2. Forecast reserve prices for fast and sustained reserves per island.
3. Forecast marginal location factors at each GIP and GXP - factors used to calculate the forecast prices at each GIP and GXP given the forecast prices at the reference points.
4. Scheduled maximum reserve risk per island.
5. Instantaneous reserve levels, fast and sustained, for each island.
6. Reserve offer stacks per island for fast and sustained responses - a list of quantities ranked by price (lowest to highest).
7. Adjusted reserve offer stacks - this is the reserve offer stack that has been adjusted for the expected level of energy output.
8. The expected HVDC component flows - the quantity of energy flow on each component of the HVDC link as calculated by the scheduling software.
9. The expected HVDC risk offsets - the values by which HVDC flows were adjusted by the system operator to determine the relevant reserve risk on the HVDC link.
10. Disconnected nodes and unfeasibility situations - indicates at which GIPs and GXPs the scheduling software could not calculate a solution. The

reasons could be due to a disconnected node, no load or generation was available, there was a deficit or surplus of bus generation, or the node was disconnected.

11. Indicative frequency keeper identification - identifies the generating stations in each island that provided frequency keeping services.

Data outputs:

The same as input selected and formatted appropriately for publication.

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Sub process:	<b>PD-020 Calculate and publish supply and demand curves</b>
Process:	Receive and publish pre-dispatch information
Source:	WITS
Destination:	Participants
Transfer mechanism:	A secure online and batch facility
Rule references:	Part G section III rule 10
Dependencies :	

#### Description:

WITS calculates the forecast supply and demand curves from current bids and offers and publishes them at same time as the pre-dispatch information relating to those bids and offers. This information is not confidential.

N.B. The current system also incorporates HVDC flows into the calculation which is not mentioned in the rules. Further clarification will be required from the Commission prior to any development.

#### Business requirements:

1. The forecast supply and demand curves for each trading period in the schedule period must be published.
2. There must be a forecast supply curve and a forecast demand curve for each island and trading period covered by the schedule period.
3. The forecast supply curves must be calculated using the latest offers and sorted by ascending price.
4. The forecast demand curves must be calculated using the latest bids and sorted by descending price.
5. The supply and demand curves must be aggregated by island (Benmore, Haywards), trading date and trading period

#### Processing:

##### System

1. Extracts prices and quantities from the offers and bids that relate to the latest pre-dispatch information.
2. Sorts the prices and quantities by island with reference to the location of the

GIP/GXP of the bid or offer.

3. Calculates the forecast supply curve using the latest offers as follows:
  - a) The forecast marginal location factor per GIP or GXP and trading period can be calculated by dividing the forecast price at the GIP or GXP by the forecast price at the reference point for the island (NI = Haywards, SI = Benmore).
  - b) The offer prices are divided by their forecast marginal location factors,
  - c) The resultant price/quantity pairs are sorted into ascending price sequence,
  - d) The quantities are aggregated by island, trading date and trading period.
4. The forecast demand curve is calculated in the same manner as the forecast supply curve except that bids are used instead of offers and the prices are sorted in descending price sequence.

#### Data inputs:

1. Offers applicable at the time of the calculation of the pre-dispatch schedule
2. Bids applicable at the time of the calculation of the pre-dispatch schedule
3. Forecast prices

#### Data outputs:

Per island and trading period:

- forecast supply curve
- forecast demand curve

Sub process:	<b>DS-010 Receive and publish dispatch information</b>
Process:	Receive and publish dispatch information
Source:	System operator
Destination:	Participants
Transfer mechanism:	A secure fast data transfer facility
Rule references:	Part G section III rule 10 and 10.5
Dependencies :	

<b>Description:</b>
<ul style="list-style-type: none"> <li>• WITS publishes the dispatch information it receives from the system operator every half hour.</li> <li>• Some of the information is confidential to the participant concerned and some applies to the market as a whole and is published for access by all participants.</li> <li>• N.B. <i>dispatch schedule period</i> is the current and next 7 trading periods (as at the runtime of the calculation process).</li> </ul>

<b>Business requirements:</b>
<ol style="list-style-type: none"> <li>1. Dispatch information from the system operator must be published immediately whenever it is received.</li> <li>2. Dispatch information must be published online and in batch mode.</li> <li>3. Confidential dispatch schedules must only be accessible by the participants for whom they are intended.</li> <li>4. All non-confidential information must be published for all participants in a timely manner.</li> <li>5. The system operator and the service provider must agree on the format and mechanism for the transfer of dispatch information provided by the former to the latter.</li> </ol>

<b>Processing:</b>
<p>System</p> <ol style="list-style-type: none"> <li>1. Receives the dispatch information from the system operator.</li> <li>2. Formats it appropriately according to whether it is confidential to individual participants or available for all participants.</li> <li>3. Publishes both the private and public information online and in batch mode.</li> </ol>

#### Data inputs:

1. The confidential information for each participant is termed the *dispatch schedule*, it is provided for every trading period in the *dispatch schedule period* and consists of three parts:
  - a) a schedule of the expected average level of electricity output by each generating plant;
  - b) a schedule of the expected average level of instantaneous reserve; and
  - c) a schedule of the expected average level of demand at each exit point.
2. The remaining non-confidential information is by trading period in the *dispatch schedule period* and consists of the following:
  - a) dispatch prices for energy and reserves at each grid injection point, grid exit point and the reference points;
  - b) the expected HVDC component flows - the quantity of energy flow on each component of the HVDC link as calculated by the scheduling software;
  - c) the expected HVDC risk offsets - the values by which HVDC flows were adjusted by the system operator to determine the relevant reserve risk on the HVDC link;
  - d) disconnected nodes and infeasibility situations - indicates at which GIPs and GXPs the scheduling software could not calculate a solution e.g. due to a disconnected node, no load or generation available, or a deficit or surplus of bus generation;
  - e) Dispatch arc flows - i.e. for a transmission line or a transformer, the quantity of energy flow on that transmission line or transformer that is equal to or greater than 95per cent of the maximum flow limit; and
  - f) dispatch group constraint arc flows and constraint formulas - i.e. the quantity of energy flows on a group of transmission lines and/or transformers calculated according to the relevant **group constraint formula** where the calculated energy flow is equal to or above 95 per cent of the maximum flow limit.

#### Data outputs:

The same information as input selected and formatted appropriately for publication and made available to participants for access online or for download.

Sub process:	<b>RT-010 Receive and publish real-time pricing information</b>
Process:	Receive and publish real-time pricing information
Source:	System operator
Destination:	Participants
Transfer mechanism:	A secure fast data transfer facility
Rule references:	Part G section III rule 7.2
Dependencies :	

<b>Description:</b>
<p>WITS publishes the real-time pricing information it receives from the system operator every five minutes.</p> <p>Once the information has been received by WITS, the real-time information is made available to all participants and to the general public via a public accessible website. This information is not confidential.</p>

<b>Business requirements:</b>
<ol style="list-style-type: none"> <li>1. All real-time pricing information received from the system operator must be published in a timely manner as soon as possible after receipt.</li> <li>2. Real-time pricing information must be published online and in batch mode.</li> <li>3. Real-time pricing information must be provided to market participants, and to the public on a publicly accessible website on behalf of the Board.</li> </ol>

<b>Processing:</b>
<p>System</p> <ol style="list-style-type: none"> <li>1. Receives the real time pricing information from the system operator.</li> <li>2. Formats it appropriately and publishes it to market participants and on a publicly accessible website, online and available for download.</li> </ol>

<b>Data inputs:</b>
<ol style="list-style-type: none"> <li>1. Real-time information per trading period and each 5 minute interval: <ol style="list-style-type: none"> <li>a) Real-time prices for energy at each grid injection point, grid exit point and the reference points.</li> </ol> </li> </ol>

- b) Real-time prices for reserves (fast and sustained) at each reference point.
- c) Quantity of reserves in MWs (fast and sustained) per reference point.
- d) Number of occurrences of the following:
- **Branch constraints:** where the transmission lines or transformers had a MW arc flow equal to the maximum flow limit;
  - **Branch group constraints:** where the groups of transmission lines and/or transformers had a total MW arc flow equal to the maximum flow limit;
  - **Generator energy minimum/maximum:** where the energy for a generator at a set of grid injection points was equal to the minimum and/or maximum generation;
  - **Generator energy and reserves maximum:** where the energy and reserves for a generator at a set of grid injection points was equal to the maximum generation;
  - **Participant reserves maximum:** where the reserves for a participant at a set of grid injection points was equal to the maximum reserve;
  - **Ramp up constraints:** where the ramp up rate was equal to the maximum ramp up rate specified in the relevant offer;
  - **Ramp down constraints:** where the ramp down rate was equal to the maximum ramp down rate as specified in the relevant offer; and
  - **GIP/GXP points estimated:** grid exit points where demand was estimated.
2. Real-time information per trading period:
- a) An average real time price - for each grid injection point and each grid exit point, a time weighted average of the six 5 minute real time prices for each trading period.

Data outputs:

The same information as input formatted for publication.

#### 8.4 Publish provisional and final prices from the pricing manager

Sub process:	<b>PP-010 Receive and publish provisional prices</b>
Process:	Receive and publish provisional prices
Source:	Pricing manager
Destination:	Participants
Transfer mechanism:	A secure fast data transfer facility
Rule references:	Part G section V rules 3.4, 3.11, 3.12.2, 3.14, 3.15, 3.16, 3.18, 3.21, 3.22
Dependencies :	

#### Description:

WITS publishes provisional prices whenever it receives them from the Pricing manager.

Provisional prices may or may not be available for one or more trading periods in a trading day. They are only provided by the Pricing manager if there is a 'provisional pricing situation' i.e. where there is a metering, SCADA or infeasibility situation and final prices cannot be provided. These prices are not confidential.

#### Business requirements:

1. Provisional prices must be published online and in batch mode.
2. Provisional prices must be published in a timely manner as soon as possible after receipt from the pricing manager.
3. The format and transfer mechanism for the delivery of these prices from the Pricing manager will need to be agreed by the service provider.

#### Processing:

##### System

1. Receives the provisional pricing information from the pricing manager.
2. Formats it appropriately and publishes it to market participants, online and available for download.

**Data inputs:**

Provisional prices can be for energy and reserves. Provisional prices for energy are provided per trading day, trading period and GIP/GXPs. Provisional prices are provided for both fast (6 second) and sustained (60 seconds) reserves per trading day and trading period at the island reference points.

**Data outputs:**

The same information as that input formatted for publication.

Sub process:	<b>FP-010 Receive and publish final prices</b>
Process:	Receive and publish final prices
Source:	Pricing manager
Destination:	Participants
Transfer mechanism:	A secure fast data transfer facility
Rule references:	Part G section V rules 3.4, 3.11, 3.12.2, 3.14, 3.15, 3.16, 3.18, 3.21, 3.22
Dependencies :	

#### Description:

WITS publishes final prices whenever it receives them from the pricing manager.

Final prices will be available for all trading periods in a trading day.

#### Business requirements:

1. All final prices must be published online and in batch mode.
2. All final prices must be published in a timely manner as soon as possible after receipt from the pricing manager.
3. The format and transfer mechanism for the delivery of these prices from the pricing manager will need to be agreed by the service provider.

#### Processing:

##### System

1. Receives the final pricing information from the pricing manager.
2. Formats it appropriately and publishes it to market participants, online and available for download.

#### Data inputs:

Final prices can be for energy and reserves. Final prices for energy are provided per trading day, trading period and GIP/GXPs. Final prices are provided for both fast (6 second) and sustained (60 seconds) reserves per trading day and trading period at the island reference points.

Data outputs:

The same final prices as received from the pricing manager formatted for publication.

## 8.5 Publish information from the clearing manager

Sub process:	<b>CO-010 Receive and publish constrained amounts</b>
Process:	Receive and publish constrained amounts
Source:	Clearing manager
Destination:	Participants
Transfer mechanism:	A secure fast data transfer facility
Rule references:	Part G section V rules 4.6, 5.7
Dependencies :	

### Description:

WITS publishes constrained on and off amounts it receives from the clearing manager by 1600 hours on the 8<sup>th</sup> business day of each month.

### Business requirements:

1. All constrained amounts must be published online and in batch mode.
2. All constrained amounts must be published in a timely manner as soon as possible after receipt from the clearing manager.
3. The format and transfer mechanism for the delivery of these prices from the clearing manager will need to be agreed by the service provider.

### Processing:

#### System

1. Receives the constrained amounts from the clearing manager.
2. Formats them appropriately and publishes them to market participants, online and available for download.

### Data inputs:

- Constrained on and off amounts (quantities)
- The amount of constrained on and off that is attributable to the system operator

#### Per:

- Generator
- Trading day

- Trading period
- GIP or block or station dispatch group
- Whether constrained on or off.

Data outputs:

The constrained amounts received from the clearing manager formatted for publication.

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Sub process:	<b>BS-010 Receive and publish block settlement differences</b>
Process:	Receive and publish block settlement differences
Source:	Clearing manager
Destination:	Participants
Transfer mechanism:	A secure fast data transfer facility
Rule references:	Part H rule 13.5
Dependencies :	

#### Description:

WITS publishes block settlement difference amounts it receives from the clearing manager by 0900 hours on the 2<sup>nd</sup> business day after the pro-forma invoices have been delivered each month.

#### Business requirements:

1. All block settlement difference amounts must be published online and in batch mode.
2. All block settlement difference amounts must be published in a timely manner as soon as possible after receipt from the clearing manager.
3. The format and transfer mechanism for the delivery of these prices from the clearing manager will need to be agreed by the service provider.

#### Processing:

##### System

1. Receives the block settlement difference amounts from the clearing manager.
2. Formats them appropriately and publishes them to market participants, online and available for download.

#### Data inputs:

For the previous month :

- the maximum block settlement difference,
- the total block settlement difference

Per:

- block.

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**Data outputs:**

The block settlement difference amounts received from the clearing manager formatted for publication.

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Sub process:	<b>BS-020 Publish invoices and supporting documentation</b>
Process:	Publish invoices and supporting documentation
Source:	Clearing manager
Destination:	Participants
Transfer mechanism:	A secure fast data transfer facility
Rule references:	Part H rule 7, 8, 11.1
Dependencies :	BS-010

<b>Description:</b>
WITS provides the means whereby participants can access the pro-forma and tax invoices prepared for them by the clearing manager.

<b>Business requirements:</b>
<ol style="list-style-type: none"> <li>1. Participants must be able to get copies of their pro-forma and tax invoices and supporting documentation as soon as they become ready from the clearing manager.</li> <li>2. Participants must be able to get copies of invoices for previous reconciliation periods.</li> <li>3. Participants must only be able to access their own invoices and not those belonging to other participants.</li> <li>4. The format and transfer mechanism for the delivery of these prices from the clearing manager will need to be agreed by the service provider.</li> </ol>

<b>Processing:</b>
<p>System</p> <ol style="list-style-type: none"> <li>1. Finds the invoice or invoices selected by the participant.</li> <li>2. Displays the invoice or invoices to the participant together with any supporting documentation.</li> <li>3. Enables the participant to take a secure copy of any required invoice to their own accounting system together with the supporting documentation.</li> </ol>

<b>Data inputs:</b>
Participant's invoice selection criteria.

<b>Data outputs:</b>
Invoices and supporting documentation selected by the participant.

## 8.6 Maintain reference and security data

<b>Sub process:</b>	<b>SD-010 Maintain reference and security data</b>
<b>Process:</b>	Maintain reference data
<b>Source:</b>	Participants, system operator, grid operator
<b>Destination:</b>	WITS
<b>Transfer mechanism:</b>	Online
<b>Rule references:</b>	
<b>Dependencies :</b>	

<b>Description:</b>
<p>WITS holds details about participants, participants trading limits, grid points and other operational information in order to:</p> <ul style="list-style-type: none"> <li>• ensure only authorized users have access to the system,</li> <li>• ensure trading is undertaken within the limits set by the Rules such as generators not being permitted to offer quantities more than can be generated by the generating plant,</li> <li>• validate that any information provided is correct and in the form specified by the Rules</li> </ul>

<b>Business requirements:</b>
<p>1. The system must maintain information about:</p> <ul style="list-style-type: none"> <li>• participants i.e. their codes and roles such as standard generator, intermittent generator, embedded generator, ancillary service agent, purchaser or a combination of roles;</li> <li>• participants trading locations i.e. the grid points at which they are allowed to trade, what type of trades e.g. bids, offers, generator reserves or interruptible load reserves, whether they are permitted to offer by unit or station;</li> <li>• participants trading limits e.g. maximum generating plant capacity; and</li> </ul>

- approved users per participant organization.
2. It must be possible to restrict access to particular functions on a user-by-user basis, for instance only specific users of a participant organization will be authorized to submit bids and offers.
  3. The maintenance of reference information must be a supervisor function i.e. restricted to a limited number of personnel.
  4. There must be a formal procedure for the approval of all users, with sign-off from higher management in a participant's organization.
  5. There must be a strong audit trail for all maintenance of reference information.
  6. System must incorporate industry standards for the management of passwords and lockouts for unsuccessful attempts.

**Processing:**

**System**

1. Allows the system operator with supervisor authority to maintain reference and security data.

**Data inputs:**

New reference and security data values.

**Data outputs:**

Updated reference and security data.

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## 8.7 Publication of Information on behalf of the Board

Sub process:	<b>BO-010 Publish information for the Board</b>
Process:	Publish final bids and offers
Source:	WITS
Destination:	Participants and public
Transfer mechanism:	A secure online and batch facility and a public accessible website
Rule references:	Part G section II rule 7
Dependencies :	

### Description:

WITS makes final bids and offers for energy and reserves available to participants and the public after two weeks. They remain available for at least a further 4 weeks.

### Business requirements:

1. The last bids and offers submitted for each trading period in each trading day must be published on a publicly accessible website two weeks after the trading day in question.
2. Four weeks worth of final bids and offers must be published i.e. from the trading day six weeks prior to the trading day two weeks prior to today.
3. It must be possible to both view all the data online and to download it.

### Processing:

#### System

1. Prepares the final bids and offers from the trading day two weeks prior to today.
2. Publishes the bids and offers on the public website, removing the bids and offers for the trading day six weeks plus one day ago and adding the new ones.

Data inputs:

Final bids and offers for the trading day two weeks prior to today.

Data outputs:

Public webpage updated with the new bids and offers.

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