

EA NETWORKS (ELECTRICITY ASHBURTON LTD)



Participant Rolling Outage Plan

SYSTEM OPERATOR IMPOSED LOAD REDUCTION

Reviewed August 2024



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Disclaimer

This participant rolling outage plan has been prepared by EA Networks to provide guidance on operating procedures, for use by persons operating the EA Networks distribution network.

Although this plan is recommended as good practice for operating the EA Networks network, it should not be relied on as a substitute for any legislative requirements or best industry practice as set out in the various national electrical industry publications.

It needs to be understood that owing to the variable nature of loadings on the network, load savings on feeders as indicated are estimations only and further considerations may be required at the time to fulfil actual requirements.

This plan can only be modified with the approval of the System Operator. The most current version is available on EA Networks intranet system with one hard copy held by the Network Control Manager.

EA Networks has direct contracts with some large customers that have contracted for specific security of supply arrangements. These contracts require EA Networks to exclude relevant feeders from its rolling outage plan to the extent reasonably practicable. The exclusions do not prevent EA Networks from complying with directions issued by the System Operator.

NOTE: Discretionary hard copy publications must be viewed as only being accurate on the day they are published.

Documentation Revision Control

Document Version	Description	Date
Version 001	Initial document	20/1/10
Version 002	Update High Impact Consumers	4/2/10
Version 003	Insert indicative plans section 16. Minor terminology and typo changes	10/3/10
Version 004	Alterations to Grid Emergency flow chart. Insert Weekly MWh saving. Emphasise criteria for high impact consumers. AUFLS clarification % load reduction	22/3/10
Version 005	Reference to Appendix P, EA Networks Operation Manual "Feeder Rolling Shutdown Sequence" added. Feeder outage duration times clarified	28/3/10
Version 006	Minor changes to clarify wording	22/4/10
Version 007	Change company name	31/5/13
Version 008	Refer to Electricity Authority , Review contact names, Review AUFLS zone 2 load reduction percentages, Alterations Appendix A and B. Add Hyperlink's	1/12/14
Version 009	Changed format, updated schedule of rolling targets, added information as required based on System Operator Rolling Outage Plan (30 September 2010)	24/3/2015
Version 010	Updated distribution list, updated Load profile, schedule for achieving target updated.	07/06/2017
Version 011	Updated, modified to reflect the 66kV only supplies taken from the GXP	27/09/2019
Version 012	Various changes for accuracy and compliance with System Operator requirements	8/12/2023
Version 013	Updated contact	15/08/2024

Next review scheduled for **August 2026**.

Introduction

This plan is provided to comply with the requirement of the System Operator Rolling Outage Plan (SOROP).

The procedures outlined are in response to major generation shortages and/or significant transmission constraints. Typical scenarios include unusually low inflows into hydro-generation facilities, reduced wind generation, unavailability of multiple thermal generating stations or thermal fuel shortfalls or multiple transmission failures.

How an event is declared and how the System Operator should communicate its requests are detailed.

The main energy saving measure listed is rolling outages and how these are structured and implemented is discussed.

NOTE: This plan refers to the [EA Networks Electricity Network System Operating Manual](#) for particular operational responses.

Purpose

Under the Code, participant rolling outage plans (PROP) are required to specify the actions that would be taken to:

- Reduce electricity consumption when requested by the System Operator.
- Comply with requirements of the System Operator Rolling Outage Plan (SOROP).
- Supplement the System Operators Rolling Outage Plan.

Reducing demand by disconnecting supply to customers must be viewed as a last resort after all other forms of savings including voluntary savings had been exhausted. EA Networks will apply best endeavours in providing continuous supply to consumers connected to the network.

Definitions

AUFLS	Automatic under Frequency Load Shedding
EDB	Electricity Distribution Business, an electricity distribution network owner/operator
Feeder	A high voltage supply line typically supplying between 100 and 2000 customers.
GXP	Transpower Grid Exit Point
GEN	Grid Emergency Notice
Network Controller	The EA Networks employee who at the time is responsible for the day-to-day control and operation of EA Networks distribution network
Network Control Manager	The EA Networks employee who is responsible for the operational management of the EA Networks distribution network and compliance to the participant outage plan
Operating Manual	EA Networks' Electricity Network System Operating Manual
PROP	Participant Rolling Outage Plan (this plan)
Code	Electricity Industry Participation Code
Rolling Outages	Planned electricity disconnections spread over different parts of the network at differing times to avoid prolonged outages at any one location
SOROP	System Operator Rolling Outage Plan
System Operator	Operator of the national electricity transmission grid

Upper South Island (USI) Upper South Island is the group of South Island EDBs from Ashburton north to the top of the South Island who have opted in to the USI load control group to manage overall load within the Upper South Island transmission constraints advised by Transpower.

Background

System Operator

The Electricity Industry Act 2010 requires the system operator to manage supply emergencies. Specific functions of the System Operator in relation to security of supply are set out in Parts 7 and 9 of the Code, including associated policies.

EA Networks

EA Networks is the electricity distribution network (lines) company (EDB) that owns, operates and maintains the lines, cables and substations delivering electricity to the Ashburton District and the upper Rangitata Gorge in South Canterbury District.

Range of Events

Events that could lead the System Operator to make a supply shortage declaration can in general terms be categorized as:

- Developing Events – an event that evolves over time, for example, a period of unseasonably low inflows to hydro catchments; and
- Immediate Events – an event that occurs with little or no warning, usually as a result of a transmission or major power station failure or unavailability of intermittent renewable generation that cannot be accurately forecast.

Communication with retailers, civil defence and other stakeholders will be as per notification procedures described in EA Networks' [Operating Manual](#).

Actions for Immediate Events

System Stability

The System Operator is required to keep enough reserve generation to cover the risk of the largest connected generator tripping. They are also required to keep the system frequency within close bounds of 50Hz. If a large generator trips, it may cause a reduction in frequency which if not rectified can result in other generators tripping and could lead to cascade failure of the transmission system.

As reserve generation cannot immediately pick up the load of a disconnected generator, an immediate load reduction is required until additional generation can pick up load. Automatic load shedding groups reduce load in stages until the frequency stabilises.

To recover from immediate events electricity consumption can be reduced by the following mechanisms:

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Reserve Market

Generators and load users with interruptible load such as distribution networks, flexibility traders or commercial/industrial users with interruptible load may offer in reserve capacity to cover the risk of the largest generating unit or a critical transmission line tripping. The ability to do this is affected by the numbers of frequency capable relays installed and the likely revenue stream from the market less the compliance costs of participating in the reserve market. EA Networks does not presently participate in this market.

Automatic Under Frequency Load Shedding (AUFLS)

If the load shed by the Reserve Market tripping is insufficient to stabilise the network, further automatic load reduction will be initiated directly by Transpower and Electricity Distribution Business' AUFLS system across the entire power system (in the case of a low frequency event that is shared between both islands via the HVDC link) or within either island depending on the characteristics of the event.

Note: EA Networks' 66kV feeders are ring connected and have embedded generation, Highbank and Montalto. This supply remains unaffected by the AUFLS control. Tripping of these circuits is only initiated by the System Operator directly requesting EA Networks to shed multiple circuits connected to its 66kV sub transmission network. EA Networks has recently commissioned AUFLS at all their Zone Substations at feeder level, There are two blocks for the AUFLS, and the settings are as below:

	Block 1 of 16%	Block 2 of 16%	Block 2 of 16%
Trip Frequency	47.5Hz	47.5Hz	46.5Hz
Trip Time	0.4s	15s	0.4s

Supply Restoration

Restoration of disconnected load must be restored in conjunction with the System Operator's instructions. This is to prevent overloading the transmission grid and/or creating further frequency instability.

Transmission Grid Emergency

The System Operator may request EA Networks to reduce load under a grid emergency notice (GEN). The same notice will go to the Upper South Island (USI) group manager, who is Orion. EA Networks is under an agreement with the USI group so that the initial response, shedding of water heating channels, will be controlled by Orion with the USI load controller. Orion will set the USI load limit to reduce the load of the collective group by the required value set by the System Operator and the Load Management Controller will start shedding the water heating channels. The System Operator will be advised and, if more shedding is required, the System Operator will instruct EA Networks to disconnect more load as per the rolling feeder outage sequence schedule (Refer Appendix B).

If an Immediate Event is in place, the Grid Emergency will take precedence.

If the System Operator declares a supply shortage during a Grid Emergency, then EA Networks will immediately respond to the request by planning, implementing and scheduling rolling outages as provided in sections 12 to 16 of this plan and in the rolling feeder outage sequence schedule. (Refer Appendix B)

Authorisation to Receive Direction and Activate

System Operator's Point of Contact

For possible participant outages, the System Operator will initiate dialog with the Duty Network Controller. The communications and directions are to be received via the telephone numbers listed below, while written communications are expected to be sent through to the Network Controller's email address.

Duty Network Controller

Authorised by the General Manager Network, EA Networks

Control Centre
EA Networks
Phone: +64 3 307 9851
Mobile: +64 27 457 3883
Email: control@eanetworks.co.nz

Additional Contacts:

Network Control Manager

Pierre Niemand
Phone: +64 03 307 9812
Mobile: +64 21 258 9437
Email: pniemand@eanetworks.co.nz

General Manager Network

Pete Armstrong
Phone: +64 3 307 9823
Mobile: +64 27 502 8078
Email: parmstrong@eanetworks.co.nz

Changes to these contact details will be advised to the System Operator and to the Electricity Industry Emergency Contact List via IECL@transpower.co.nz.

Implementation Responsibility

The Duty Network Controller must notify the Network Control Manager, or the General Manager Network (GM Network) should the Network Control Manager be unavailable, as soon as possible and where possible prior to any operations affecting supply to consumers. The Network Control Manager will notify the GM Network as soon as possible. For some emergencies, operating measures may be required immediately. Imposed supply interruptions to consumers shall where possible be applied on a fair and equitable basis. For after normal working hours or where the Network Control Manager is not available, the Duty Network Controller shall notify company management in accordance with Section 6 of EA Networks' Operating Manual.

Implementing Rolling Outages

Schedule for Achieving Target Levels

EA Networks' **indicative** plans for achieving 5%-25% savings are outlined in the following tables. The cumulative outage durations will be dependent upon the percentage savings level requested. Outages shall be of maximum five hours duration (two per day), with each individual feeder load group only allocated once per day. Feeders would be shed on a half day cycle with the frequency based on the priority allocated to the feeder load group.

Winter

Savings Target	Feeders Impacted	Number of Outages per Day	Maximum Outage Durations	Approximate Weekly MWh savings for typical winter week
5%	3	5	2hrs	29

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10%	4	10	3hrs	174
15%	5	15	4hrs	522
20%	7	20	6hrs	1392
25%	9	25	6hrs	2175

Summer

Savings Target	Number of Feeders Impacted	Number of Outages per Day	Maximum Outage Durations	Approximate MWh savings for typical summer week reductions given near peak loadings
5%	3	5	2hrs	82
10%	6	10	3hrs	498
15%	9	15	4hrs	1467
20%	12	20	6hrs	3912
25%	15	25	6hrs	6112

How the Plan Meets the Criteria of Part 5 of the SOROP?

For a planned event (>24hours), to ensure public health and safety is preserved and costs to economy are minimised, priority consumers (refer Appendix B of EA Networks Operating Manual) will be notified and where possible arrangements made to satisfy basic requirements.

The priority criteria outlined in section 5.1 of the System Operator Rolling Outage Plan (SOROP) have been applied in developing the strategy for implementing rolling outages within the EA Networks supply area.

Priority	Priority Concern	Maintain Supply to:
1	Public Health and Safety	EA Networks NOC Ashburton Hospital (if on-site generation is not adequate) Ashburton District Council emergency operation centre Police, Fire and Ambulance infrastructure
2	Maintaining important public services	Communication networks Water treatment and sewage pumping stations Fuel delivery services
3	Public Health and Safety	Medical centres, rest homes and residential care facilities. Schools, churches and public halls acting as CDEM facilities. Street lighting and traffic signals
4	Animal health and food production/storage	Dairy farms and chicken/turkey sheds ANZCO, Silver Fern Farms, Talleys

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5	Maintaining production	Ashburton CBD Commercial and industrial premises throughout Mid- Canterbury
6	Avoiding disruption to households	Residential premises

*Reference: priorities in this table are based on information contained in section 13 of the National Civil Defence Emergency Management Plan 2015.

Load Disconnection Process

Each distribution feeder exiting a zone substation (or switching station, or group of feeders where they belong to a parallel or ring supply) will be named as a “Rolling outage feeder”.

Rolling outage feeders will each be assigned a priority determined from the mix of customers supplied on each feeder (residential, commercial, industrial, farming, essential services’ etc.) and by applying the priority criteria included in section 5.1 of the SOROP. Rolling outage feeders will be included in a rolling outage sequence schedule (refer Appendix B) maintained and updated from time to time as appropriate. Regular reviews of the sequence will be made, taking into account seasonal variations and disruptions to high impact consumers.

Feeder rolling schedule - Summer vs Winter Loads

There is a clear difference between what types of load come online, go offline during the respective seasons.

Summer months bring irrigation loads online. The majority of these loads are in the rural sectors of the Distribution Network and hence are serviced from Rural Substations.

Winter months bring heating loads online and irrigation loads go offline. During this time of the year, the heating loads are insignificant in relation to national demands but are still contributing to the national generation shortfall that is being managed in an event.

Three different orders of interruptions are provided to allow for rotation of interruption times to assist in minimising inconvenience to consumers and to provide a sense of fairness to all consumers. Where possible, outages should be programmed to be held during daylight hours, between 8am and 5pm, only extending into the evening where necessary to achieve the required savings level or accommodate switching logistics.

A set of switching instructions will be prepared for each rolling outage group, and a record of the off and on times will be maintained on the supplementary log as illustrated in Appendix C

Unless advised otherwise by the System Operator, the rolling outages plan must provide sufficient time for switching of load to ensure that EA Networks load does not dramatically increase or decrease load in any 5-minute period. The Duty Network Controllers shall monitor activities in relation to this limit so that an increase or decrease of demand is not by more than 25 MW in any five-minute period without the system operator’s prior approval. EA Networks has in the past reached 181MW of load in the middle of summer. Most of this load was due to irrigation. An average winter day will see the load only reach 65MW, and this will be during the day, with the night load being even lower. This means that for EA Networks to make a saving of 20%, and that number to be in the region of 25MW, it will have to be summer load of 120MW or more.

If EA Networks is unable for some reason to meet the load disconnection/restoration ramp rates, or if there is expected to be a material departure (greater than 20%) from the previously provided half hourly GXP load forecast / load profile, then EA Networks would communicate directly with the System Operator.

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Grid Exit Points at which the distributor plans to implement rolling outages

EA Networks has only one Grid Exit Point (Ashburton ASB) which has three transformer feeds into a 66kV ring bus configuration. Due to this, Rolling Outages initiated by the System Operator by switching out individual 220/66kV transformers will either have no effect or cause a complete black out if the remaining transformers cascade trip on overload. Rolling outages should only happen at distribution feeder level, and this should be done by the EA Networks Controller on duty under the instructions of the System Operator.

Process for restoring load in a controlled manner

Prior to notifying and implementing a rolling outage plan, EA Networks will consult with the System Operator Security Coordinator to establish and agree to a process for shedding and restoration, which may include a MW load cap to operate under during restoration phases. Under the USI agreement, EA Networks will be given a maximum load value from the USI group manager to which it should load shed, and the same process will be used to restore load within the five-minute constraints. The USI value will only be used if the load that was shed, was not beyond the hot water load. If the load that EA Networks needs to shed is above the hot water load, then EA Networks will shed/restore their own load to meet the targets set by the System Operator.

How the operational plan is to be communicated with the System Operator;

EA Networks will contact the System Operator Emergency Response Project Manager for administration purposes including reporting performance against targets using the following details:

system.operator@transpower.co.nz

Transpower New Zealand Ltd
Waikoukou
22 Boulcott St,
Wellington 6011
www.transpower.co.nz
Telephone: 0800 488 500

Backup arrangements to cover unexpected contingencies.

If an unplanned event (Interruption by fault) were to occur in the distribution network when participant rolling outage plans were in effect, the Network Control Manager, GM Network, Chief Executive, or a member of the network management in accordance with section 6 of EA Networks' Operating Manual will make the decision to modify the rolling outage to maintain the designated target. Where possible, any changes to the planned timetable should be published on EA Networks website and communicated to retailers.

Coordination with Grid Emergencies

Grid Emergencies

If the System Operator declares a Grid Emergency during a Developing Event, the Grid Emergency will take priority. As water heating load generally would not be used to reduce load in a Developing Event, EA Networks would make water heating load available for load reduction when required for the grid emergency. This load would be shed, and the System Operator advised. The System Operator may then instruct the duty Network Controller to shed load to a predetermined value and time period.

Process for reverting to Participant Rolling Outage Plan at the end of Grid Emergency.

The System Operator will directly contact EA Networks Duty Network Controller to advise that the Grid Emergency has been revoked and announce what the desired state of the rolling outage plan is to be.

Monitoring and reporting performance against targets

Target Monitoring and Reporting

The Duty Network Controller in conjunction with the Network Control Manager will monitor actual demand versus the target and report values to the System Operator at regular intervals or at intervals agreed by both parties.

For load shedding to a daily target, the Network Control Manager assisted by the Senior Distribution Management System Engineer will monitor the System Operator's report of our savings results to our target and together with the Chief Executive and General Manager - Network, review future load shedding to increase or decrease amount of rolling outages to enable the weekly target to be met. In parallel (as a check) with the System Operator, the Network Control Manager will be responsible for daily and weekly reporting of consumption relative to target levels (using our data sources). The General Manager – Network, Network Control Manager and Network Controllers will review weekly targets and prepare plans for weekly rolling outages based on savings required.

In the case of daily or real time limits, where the System Operator reporting will be too slow for real time action to be taken, the Network Control Manager assisted by the Senior Distribution Management System Engineer will monitor our savings and adjust accordingly in the timeframe required.

The Network Controller will also provide regular reports to the System Operator (at a frequency notified by the System Operator) assessing compliance with this plan and compliance with direction from the System Operator.

Monitoring

The Duty Network Controller will enter in the Rolling Outage Log, times of disconnection and reconnection of all feeder interruptions. The log supplement sheet to be used by Network Controllers is shown in, Appendix C.

Systems to be used for monitoring savings performance against targets

EA Networks Duty Controller will utilise EA Networks Supervisory Control and Data acquisition (SCADA) System to monitor the savings performance against targets set out by System Operator.

How performance will be reported to the system operator

The Duty Network Controller will provide regular reports to the System Operator (at a frequency and over a communications medium advised by the System Operator) assessing compliance with this plan and compliance with directions from the System Operator.

Load restoration

Who revokes the Supply Shortage Declaration.

The System Operator will advise the Duty Network Controller of the withdrawal of the Supply Shortage Declaration. The communications and directions are to be received by telephone and/or via email. The System Operator shall immediately advise the Network Control Manager, General Manager – Network, Chief Executive or a member of network management of the status change.

How load restoration is to be coordinated with the system operator

The Duty Controller will consult with the System Operator to establish and agree to a process for restoration, which may include a MW load cap to operate under during restoration phases.

The process for restoring load in a controlled manner

Restoration of disconnected load must be restored in conjunction with the System Operator by the Duty Network Controller. This is to prevent overloading the transmission grid and/or creating further instability. Under the USI

agreement, EA Networks will be given a value from the USI group manager to which it should load shed, and the same process will be used to restore load.

Process for restoring load in a controlled manner – Supply Shortage

Prior to notifying and implementing a rolling outage plan, EA Networks will consult with the System Operator Security Coordinator to establish and agree to a process for shedding and restoration, which may include a MW load cap to operate under during restoration phases. Under the USI agreement, EA Networks will be given a maximum load value from the USI group manager to which it should load shed, and the same process will be used to restore load within the five-minute constraints. The USI value will only be used if the load that was shed, was not beyond the hot water load. If the load that EA Networks needs to shed is above the hot water load, then EA Networks will shed/retore their own load to meet the targets set by the System Operator.

Communication Strategy

Strategy for informing rolling outage plan to stakeholders

Communication with retailers, civil defence and other stakeholders will be as per notification procedures described in EA Networks' Operations Manual section 3.6. In the event of immediately imposed load reductions, the Duty Network Controller will refer Civil Defence, retailer and media inquiries to the Network Control Manager or in their absence, the General Manager – Network. If they are unavailable, calls are to be referred to the Chief Executive or General Manager – Customer and Commercial.

In the event of EA Networks' initiating a Major or Extreme Event under the Standard - Emergency Preparedness Part 2 – Extreme Events, the communication arrangements of the CIMS structure will be used, with the Public Information role providing information to the media, retailers, connected customers and other stakeholders and the Civil Defence Liaison role providing information to Civil Defence, Police and local authorities.

Coordination of public messages with System Operator

If the System Operator has made a supply shortage declaration in response to a developing event it may put in place general media advertising covering the need to conserve electricity and advising that rolling outages will be necessary.

If EA Networks plans to issue a public message related to rolling outages then this will be sent to the System Operator for review before being released. Any such communication will give a time for response from the System Operator, so as their feedback can be included before EA Networks issues the message to the public.

Notifications to Public Agencies

In general, media and consumer notifications will be carried out in accordance with Sections 3.6 and 6 of [EA Networks' Operating Manual](#).

However, with the wide scale impact of rolling outages it is not feasible to use the standard planned outage notification process (mainly because retail and postal systems could not process the many outage notifications required).

In the event of EA Networks' initiating a Major or Extreme Event under the Standard - Emergency Preparedness Part 2 – Extreme Events, the communication arrangements of the CIMS structure will be used, with the Public Information role providing information to the media, retailers, connected customers and other stakeholders and the Civil Defence Liaison role providing information to Civil Defence, Police and local authorities.

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When implementing an extended rolling outage plan, EA Networks will notify outages in a number of ways:

- Public notices - EA Networks will place public notice advertisements providing a rolling outage timetable showing the times and areas affected by rolling outages. The advertisement will provide details of our website page for Consumers that wish to seek more information.
- EA Networks website - a dedicated website page will be set up which shows the rolling outage timetable. A future plan is to allow consumers to register their ICP and request future planned interruption information.

Where possible, EA Networks will provide 7 day's notice of all rolling outage plans, generally publishing and issuing notifications on a Monday to apply from the following Monday.

Appendix A: Draft of Rolling Outage Public Notice

ELECTRICITY SUPPLY INTERRUPTIONS

Please read - your supply may be affected

EA Networks is required to reduce electricity consumption with rolling power outages across the Ashburton District to meet a X% savings target set by the System Operator in response to the current energy crisis.

Voluntary savings have already helped us reduce the impact of rolling outages, and further savings may allow us to reduce these planned cuts further.

Outages will occur within the time periods noted in the schedule below. Wherever possible, we will delay cuts and restore power early, so please treat all lines as live.

Within each area we have prioritised individual circuits to minimise the cost and disruption to our community, and timed outages accordingly.

YOUR SAFETY AND PROTECTION

It is important to ensure you keep safe around electricity even when it is off.

- Power may be restored at any time.
- Please leave all appliances off during power cuts, particularly ovens and cook tops.
- To prevent damage to computers and other electrical equipment turn power off at the wall prior to outages.

Are you reliant on power ... If your health may be affected by these outages you will need to make alternative arrangements or contact your health care provider for assistance. Please note telephones that rely on a mains supply may not operate during outages, so plan in advance.

Traffic lights will be affected by these outages, so please avoid travelling in the affected areas if possible. Avoid using lifts.

Appendix B

ZONE Substation Feeder Rolling Shutdown Sequence

Note:

1. Where possible high impact customers must be given as much fore warning as possible to minimise disruption.
2. At the time shutdown sequences may need to be reviewed to take into account section 7 and 12 of this plan.

Winter

Substations	Feeder	Est. MW	Order 1	Order 2	Order 3	Operation Notes	Operator Location	High impact Customer
(ASHBURTON)	Lagmhor	2	1	5	11	Open Feeder TC27	SCADA	RX Plastics
(ASH)	Hampstead	1	2	6	10	Open Feeder TR12	SCADA	
	Ashburton South	1	3	7	9	Open Feeder TD26	SCADA	
	Ashburton West	2	4	8	8	Open Feeder TE25	SCADA	Rest Home Coldstream
	Tinwald East	2	5	9	7	Open Feeder TY05	SCADA	Lake Hood, Terrace View Rest Home
	Oak Grove	2	6	10	6	Open Feeder TJ20	SCADA	Hospital
	Netherby	1	7	11	5	Open Feeder TK19	SCADA	Rest Home Princes Court
	Winchmore	1.5	8	1	2	Open Feeder TW07	SCADA	ADC pumps (Check)
	Wills st	3.5	9	2	3	Open Feeder TO15	SCADA	Rest Home Cameron Courts, Rosebank, ADC pumps (check)
	Industrial Estate	1.5	10	3	2	Open Feeder TQ13	SCADA	
	CBD	2.5	11	4	1	Open Feeder TX06	SCADA	Radio Stations

NORTHTOWN	Davis Crescent	0.5	1	5	11	Open Feeder ZX03	SCADA	Rest home Princes Court
(NTN)	King St	1.5	2	6	10	Open Feeder ZL15	SCADA	
	Company Rd	1	3	7	9	Open Feeder ZR09	SCADA	Ash Meat processors
	Racecourse Rd	0.5	4	8	8	Open Feeder ZS08	SCADA	Hotel Ashburton
	Golk Links	0.5	5	9	7	Open Feeder ZV05	SCADA	
	Smithfield rd	0.5	6	10	6	Open Feeder ZW04	SCADA	
	Saunders rd	2.5	7	11	5	Open Feeder ZG20	SCADA	ADC pumps (Check)
	Chalmers	0.5	8	1	4	Open Feeder ZI18	SCADA	
	Princes St	1	9	2	3	Open Feeder ZK16	SCADA	ADC pumps (Check)
	Allenton	0.5	10	3	2	Open Feeder ZN13	SCADA	
	West St	1.5	11	4	1	Open Feeder ZM14	SCADA	RX Plastics. Rosebank, ADC Pumps

Winter

Rural Subs	Feeder	Est. MW	Order 1	Order 2	Order 3	Operation Notes	Operator Location	High impact Customer
COLDSTREAM	Hinds South	0.2	1	5	9	Open Feeder JY02	SCADA	
(CSM)	Junction rd	0.2	1	5	9	Open Feeder JX03	SCADA	
	Coldstream	0.3	1	5	9	Open Feeder JW04	SCADA	
	Poplar rd	0.2	1	5	9	Open Feeder JV05	SCADA	
CAREW	Carew	0.3	1	5	9	Open Feeder NV05	SCADA	
(CRW)	Hinds West	0.3	1	5	9	Open Feeder NW04	SCADA	
	Ealing	0.3	1	5	9	Open Feeder NX03	SCADA	
	Fountaines Rd	0.3	1	5	9	Open Feeder NY02	SCADA	Hinds Township
HACKTHORNE	Punawai	0.2	2	6	8	Open Feeder KY02	SCADA	
(HTH)	Hackthorne South	0.2	2	6	8	Open Feeder KX03	SCADA	
	Maronan	0.2	2	6	8	Open Feeder KW04	SCADA	
	Hackthorne	0.2	2	6	8	Open Feeder KV05	SCADA	
LAGMHOR	Ferimans Rd	0.3	3	7	7	Open Feeder GY02	Sub	
(LMR)	Frasers Rd West	0.3	3	7	7	Open Feeder GX03	Sub	
	Frasers Rd East	0.3	3	7	7	Open Feeder GV05	Sub	

	Winslow	0.3	3	7	7	Open Feeder GW04	Sub	
DORIE	Dorie West	0.7	3	7	7	Open Feeder RZ01	Sub	
(DOR)	Dorie East	0.2	3	7	7	Open Feeder RW04	Sub	
	Rakaia Huts	0.2	3	7	7	Open Feeder RY02	Sub	

Winter

Rural Subs	Feeder	Est. MW	Order 1	Order 2	Order 3	Operation Notes	Operator Location	High impact Customer
WAKANUI	Hakatere	0.2	4	8	6	Open Feeder WY02	SCADA	Five star
(WKU)	Elgin	0.2	4	8	6	Open Feeder WX03	SCADA	
	Seaview	0.2	4	8	6	Open Feeder WV04	SCADA	
LAURISTON	Barrhill	0.2	4	8	6	Open Feeder UY02	SCADA	
(LSN)	Mitcham	0.2	4	8	6	Open Feeder UX03	SCADA	
	Braemar	0.2	4	8	6	Open Feeder UW04	SCADA	
	Urrall	0.2	4	8	6	Open Feeder UV05	SCADA	
EIFFELTON	Willowby	0.2	5	9	5	Open Feeder YX03	Sub	
(EFN 66)	Longbeach	0.2	5	9	5	Open Feeder YV05	Sub	
	Flemmington	0.2	5	9	5	Open Feeder YW04	Sub	

	Lynnford	0.2	5	9	5	Open Feeder YY02	Sub	
PENDARVES	Christys rd	0.2	6	1	4	Open Feeder PV05	Sub	
(PDS)	Pendarves west	0.2	6	1	4	Open Feeder PW04	Sub	
	Kyle	0.2	6	1	4	Open Feeder PX03	Sub	
	McCrorys Rd	1.5	6	1	4	Open Feeder PY02	Sub	
METHVEN 33	Springfield	0.2	6	1	4	Open Feeder BS88	Sub	
(MVN)	Lyndhurst	0.3	6	1	4	Open Feeder BS89	Sub	Normally Open
	Mt Hutt	0.4	6	1	4	Open Feeder BS92	Sub	

Winter

Rural Subs	Feeder	Est. MW	Order 1	Order 2	Order 3	Operation Notes	Operator Location	High impact Customer
MT SOMERS	Anama	0.2	7	2	3	Open Feeder BC38	Sub	
(MSM)	Ashburton Gorge	0.5	7	2	3	Open Feeder BC39	Sub	
	Staveley	0.2	7	2	3	Open Feeder BC40	Sub	
OVERDALE	Chertsy	0.4	7	2	3	Open Feeder OY02	SCADA	
(OVD)	Hatfield	0.4	7	2	3	Open Feeder OX03	SCADA	
	Rakaia	0.7	7	2	3	Open Feeder OW04	SCADA	Rakaia Township
	Acton	0.2	7	2	3	Open Feeder OV05	SCADA	
	Overdale South	0.2	7	2	3	Open Feeder OU06	SCADA	
FAIRTON	Silver Fern	2.5	8	3	2	Open Feeder DF86	Sub	** PPCS Load Reduction)
(FTN)	Dromore	0.3	8	3	2	Open Feeder DI83	Sub	
	Talleys	3.5	8	3	2	Open Feeder DF77	Sub	Talleys Load reduction)?
SEAFIELD	CMP	7	8	3	2	Open 11kV EG70	Sub	** CMP (Load reduction) ???
SFD								

METHVEN 66	Line Road	0.5	9	4	1	Open Feeder VT07	SCADA	
(MTV)	Methven South	1.5	9	4	1	Open Feeder VS08	SCADA	
	Methven North	1.5	9	4	1	Open Feeder VR09	SCADA	
MOUNT HUTT	Mt Hutt 1	1.5	9	4	1	Open Feeder AI92	Sub	**Snow Making and safety
(MHT)	Mt Hutt 2	1.5	9	4	1	Open Feeder AJ92	Sub	**Snow Making and safety
	Blackford Rd	0.2	9	4	1	Open Feeder AK92	Sub	

Summer

Urban Subs	Feeder	Est. MW	Order 1	Order 2	Order 3	Operation Notes	Operator Location	High impact Customer
ASHBURTON	Lagmhor	2.5	1	5	11	Open Feeder TC27	SCADA	RX Plastics
(ASH)	Hampstead	1	2	6	10	Open Feeder TR12	SCADA	
	Ashburton South	1	3	7	9	Open Feeder TD26	SCADA	
	Ashburton West	1.5	4	8	8	Open Feeder TE25	SCADA	Rest Home Coldstream
	Tinwald East	1.5	5	9	7	Open Feeder TY05	SCADA	Lake Hood
	Oak Grove	1	6	10	6	Open Feeder TJ20	SCADA	Hospital
	Netherby	1	7	11	5	Open Feeder TK19	SCADA	Rest Home Princes Court
	Winchmore	3.0	8	1	2	Open Feeder TW07	SCADA	ADC pumps (Check)

	Wills st	1	9	2	3	Open Feeder TO15	SCADA	Rest Home Cameron Court, Rosebank ADC pumps (check)
	Industrial Estate	1.5	10	3	2	Open Feeder TQ13	SCADA	
	CBD	1.7	11	4	1	Open Feeder TX06	SCADA	Radio Stations
NORTHTOWN								
(NTN)	Davis Crescent	0.3	1	5	11	Open Feeder ZX03	SCADA	Rest home Princes Court
	King St	1	2	6	10	Open Feeder ZL15	SCADA	
	Company Rd	1	3	7	9	Open Feeder ZR09	SCADA	Ash Meat processors
	Racecourse Rd	0.4	4	8	8	Open Feeder ZS08	SCADA	Hotel Ashburton
	Golf Links	0.4	5	9	7	Open Feeder ZV05	SCADA	
	Smithfield rd	0.4	6	10	6	Open Feeder ZW04	SCADA	
	Saunders rd	0.5	7	11	5	Open Feeder ZG20	SCADA	ADC pumps (Check)
	Chalmers	0.3	8	1	2	Open Feeder ZI18	SCADA	
	Princes St	0.5	9	2	3	Open Feeder ZK16	SCADA	ADC pumps (Check)
	Allenton	0.3	10	3	2	Open Feeder ZN13	SCADA	
	West St	0.8	11	4	1	Open Feeder ZM14	SCADA	RX Plastics. Rosebank, ADC Pumps

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