

# Waipā Networks Ltd

## Security of Supply Participant Rolling Outage Plan

## Electricity Network Contingency Plan

**March 2024**

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## REVISION SHEET

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		Nov 2017	Refer to historical document revision.
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all	M Ngarimu W Amoore	31-Mar-2024	<p>Overall document review, changes include:</p> <ul style="list-style-type: none"> <li>• Roles and responsibilities, contact personnel,</li> <li>• Feeder numbering and average loading updated.</li> <li>• Amended AUFLS and subsequent manual shedding feeder assignments.</li> <li>• Amended feeder classification and rolling outage table based on the updated classification.</li> <li>• Shutdown Notification section updated.</li> <li>• Highlighting Waipā does not have operational control of the 11kV CB at the GXPs. Hence, the Control Room will contact the System Operator’s regional control centre for CB operation.</li> <li>• Other general updates across the document, including the order of sections</li> </ul>

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## 1 Introduction

This plan was written to comply with 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, loss of multiple thermal generating stations 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.

## 2 Purpose

Under the regulations, a Participant Rolling Outage Plan (PROP) is required to specify the actions that would be taken to;

- Reduce electricity consumption when requested by the System Operator
- Comply with the requirements of the System Operator Rolling Outage Plan (SOROP)
- Comply with Electricity Governance (Security of Supply) Regulations 2008 and Electricity Governance (Security of Supply) Amendment Regulations 2009
- Supplement the System Operator's Security of Supply Outage Plan

Reducing demand by disconnecting supply to consumers will be a last resort after all other forms of savings including voluntary savings had been exhausted. Waipā Networks Ltd will always endeavour to keep supply on to its consumers where possible.

### 3 Definitions

<b>AUFLS</b>	Automatic Under Frequency Load Shedding
<b>Control Room</b>	WEL Networks Control Room - Waipā Networks has contracted WEL Networks to provide its system operational services
<b>CDEM</b>	Civil Defence Emergency Management
<b>EDBE</b>	Electricity Distribution Business as defined in section 2(1) of the electricity Act 1992
<b>The Code</b>	Electricity Industry Participation Code 2010
<b>Feeder</b>	A high voltage supply line typically supplying between 100 and 2500 consumers
<b>GXP</b>	Transpower Grid Exit Point
<b>GEN</b>	Grid Emergency Notice
<b>Lifelines</b>	Waikato Lifeline Utilities Group
<b>PROP</b>	Participant Rolling Outage Plan (this plan)
<b>Rolling Outages</b>	Planned electricity disconnections spread over different parts of the network at different times to avoid prolonged outages at any one location
<b>Security Coordinator</b>	Person responsible for system security on the Grid
<b>SOROP</b>	System Operator Rolling Outage Plan
<b>Supply Shortage Declaration</b>	Declaration made by the System Operator under Regulation 9
<b>System Operator</b>	Operator of the New Zealand’s Electricity Transmission Grid
<b>Grid</b>	New Zealand’s Electricity Transmission Grid
<b>Waipā Networks</b>	Waipā Networks Limited

## 4 Background

### 4.1 Transpower

Transpower is a State-Owned Enterprise, that owns and operates New Zealand's Electricity Transmission Grid (the Grid) – the network of high voltage transmission lines and substations that transports bulk electricity from where it is generated to the Electricity Distribution Business' (EDB) such as Waipā Networks.

As a System Operator, Transpower manages the real-time operation of the Grid balancing the amount of energy generated with demand.

### 4.2 System Operator

A function of the System Operator under the Electricity Act is to use reasonable endeavours to ensure the security of the electricity supply. The System Operator's activities include forecasting supply and demand, developing and publishing guideline hydro levels for the security of supply, contracting for reserve energy, and improving the ability of consumers to manage price risks in the market.

### 4.3 Waipā Networks

Waipā Networks is the EDB that owns and operates the electricity assets (lines, cable and transformers etc) that convey power from Transpower's GXP's at Cambridge and Te Awamutu to the surrounding environ.

## 5 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, 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 line or major power station failure or a shortfall of generation available for dispatch.

### 5.1 Major Incident

A Developing or Immediate event will be classed by Waipā Networks as a major incident and Waipā Networks' management team will activate the appropriate contingency plan and manage the incident accordingly.

Communication with Electricity Retailers, civil defence and other stakeholders will be as outlined in Appendix B – Rolling Outage Media Notification (Draft).



## 6 Waipā Networks Role Responsibilities

Table 1: Roles and responsibilities

Role	Waipā Networks Personnel
Receive communication from System Operator of declaration of a Supply Shortage	Chief Executive and GM Network
Receive communication from System Operator	Control Room (WEL Networks, Network Operations Manager)
Implement this Plan	Incident Controller (normally GM Network)
Prepare load-shedding schedules	Engineering Manager in liaison with Control Room
Customer Notification	GM Customer & Community Engagement
Weekly Savings reporting	Engineering Manager with support from Planning Engineer
Retailer and Consumer Notification	GM Customer & Community Engagement
Revoking rolling outages	Control Room (WEL Networks, Network Operations Manager)
Reporting to System Operator	Incident Controller
Reporting to media and public agencies	GM Customer & Community Engagement
Reporting to CDEM and Lifelines	GM Customer & Community Engagement

## 7 Communication with the System Operator

The Waipā Networks managerial and operational contact for this Participant Rolling Outage Plan is:

- **Administrative Contact:**

[Weihao Zhou](#)

GM Network

[weihao.zhou@waipnetworks.co.nz](mailto:weihao.zhou@waipnetworks.co.nz)

- **Operational Contact with System Operator:**

Waipā Networks (and its Control Room) will contact the System Operator regarding administrative matters (such as supply shortage declarations, directions to save energy, acknowledgment of receipt of a direction to save energy, rolling outage monitoring, load/load shedding forecasts, media/public communications) using the following details:

Transpower

System Operator

Email: [system.operator@transpower.co.nz](mailto:system.operator@transpower.co.nz)

PH: 04 590 7000

22 Boulcott St  
Wellington Central  
Wellington  
Private bag 3215

- **Operational Contact with Waipā Networks:**

Waipā Networks has contracted its Control Room Service to WEL Networks Ltd. For operational enquiries, the System Operator can contact WEL Networks Control Room at;

WEL Control Centre

Duty Controller  
DDI: +64 7 850 3130  
SystemControl@wel.co.nz

WEL Networks Operations Manager

Steve Hull  
Network Operations Manager  
DDI: +64 7 850 3220 | MOB: +64 21 681 350

On receipt of direction to Save Energy from the System Operator, Waipā Networks (or its Control Room) will acknowledge this receipt by email.

Prior to notifying and implementing a rolling outage plan, Waipā Networks will consult with the System Operator Security Coordinator to establish a process for shedding and restoration, which may include a MW load cap to operate under during restoration phases. Unless a different agreement is made with the System Operator, load shedding and restoration shall be no more than 25MW per any five-minute period.

Waipā Networks will provide the System Operator with a daily, rolling week-ahead forecast of half-hourly load at each GXP, taking into account the impact of the planned rolling outages. Whenever any change in the forecast for a GXP of more than 20% for any half hour is expected Waipā Networks will highlight this to the System Operator.

## 8 Actions for Immediate Events

### 8.1 Grid 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 Grid frequency at 50Hz +/- 0.5Hz.

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 the load. Automatic load-shedding groups reduce the load in stages until the Grid frequency stabilises.

To recover from Immediate Events electricity consumption can be reduced by;

- Under-Frequency Relay turning off Controllable Load (Reserves Market),
- Disconnecting Consumers by Automatic Under-Frequency Load Shedding of Feeders,
- Managing Fonterra's seasonal load and Requesting Export Generation
- Manually Disconnecting Consumers by Shedding Feeders

## 8.2 Reserve Market

Generators and load users with interruptible load such as EDBs 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 number of frequency-capable relays installed and the likely revenue stream from the market less the compliance costs of participating in the reserve market.

Waipā Networks participates in Reserves Market through a Market Aggregator. Waipā Networks has ripple relays that can offer dis-connectable water heating loads connected to the Transpower's Cambridge and Te Awamutu GXPs.

## 8.3 Disconnecting Consumers

### 8.3.1 Automatic Under-Frequency Load Shedding of Feeders

If the load shed by the Reserve Market tripping is insufficient to stabilise the Grid, further automatic load reduction is required.

Each EDB must (unless exempted) have available at all times two blocks of load each of 16% of its total load to be shed by automatic under-frequency relays.

In Waipā Networks' case, the Automatic Under-Frequency Load Shedding (AUFLS) relays are owned, operated and maintained by Transpower.

### 8.3.2 AUFLS Block 1

If the Grid frequency fails to recover after a Reserve Market load shed, AUFLS Block 1 shedding will occur. This will disconnect 16% of Waipā Networks' network load by disconnecting feeders.

AUFLS Block 1 feeders at Transpower's Cambridge GXP are:

- C2842 - Tamahere
- C2772 - French Pass,
- C2742 - Pencarrow.

AUFLS Block 1 feeders at Transpower's Te Awamutu GXP are:

- T2762 - Pukeatua
- T0022 - Kawhia
- T0026 - Hairini and
- T2752 - Mystery Creek.

### 8.3.3 AUFLS Block 2 (Note by 2025 AUFLS Scheme will change)

If Block 1 tripping fails to restore frequency, Block 2 shedding will occur. This will disconnect a further 16% of Waipā Networks' network load by disconnecting more feeders.

AUFLS Block 2 feeders at Transpower's Cambridge GXP are:

- C2732 - Kaipaki
- C2862 - Monavale
- C2702 - Roto-O-Rangi and
- C2712 - Cambridge North.

AUFLS Block 2 feeders at Transpower's Te Awamutu GXP are:

- T0024 – Kiokio Feeder
- T0027 - Paterangi feeders.

### 8.3.4 Note on Fonterra Seasonal Load

If the System Operator requests more load to be dropped, and Fonterra's seasonal load exists, Waipā Networks will liaise with Fonterra to voluntarily reduce the load in proportion with the System Operator energy saving targets in preference to rolling outages.

As a last resort, Fonterra's Hautapu and Te Awamutu dairy factories will be switched off if their seasonal load exists. This "last resort" nature is reflected as the Fonterra feeders have been assigned with the lowest priority in Section 8.3.5 and 8.3.6.

Waipā Networks will endeavour to schedule Fonterra's Hautapu and Te Awamutu dairy factory outages at separate times.

If the seasonal load is not present, the Control Room will ask Fonterra Te Awamutu to generate in excess of their load requirement if it is safe to do so. Fonterra at times exports from the Te Awamutu dairy factory so they have retailing arrangements in place to reconcile their exported electricity.

### 8.3.5 Manual Feeder Shedding – Following AUFLS Event

If Waipā Networks' under-frequency relay tripping of controlled load and Transpower's AUFLS Block 1, Block2 feeder tripping and fail to stabilise the Grid frequency the System Operator will shed more load.

Emergency load shedding feeders are listed below in order of importance (top feeders at each GXP to be switched off first, bottom feeders are to be switched off last);

NOTE: Waipā Networks currently takes 11kV supplies directly from Transpower's Cambridge and Te Awamutu GXP 11kV circuit breakers, with no operational control. Control Room will contact Transpower's Regional Control for breaker operation for Manual shedding and restoration.

#### Cambridge GXP feeders

- 1) C2852 - St Kilda (Residential)
- 2) C2802 – Leamington (Residential)
- 3) C2832 - Cambridge East (Residential)
- 4) C2722 - Cambridge Town (Commercial)
- 5) APL (open at G359C to shed APL only, retain supply to Ripple Plant) (Industrial)
- 6) C2772 & C2802 - Hautapu A & Hautapu B (Industrial)

#### Te Awamutu GXP feeders

- 1) T2822 - Ohaupo (Rural)
- 2) T2742 – Kihikihi (Residential)
- 3) T0025 - Te Awamutu West (Residential)
- 4) T2832 - Te Awamutu East (Commercial)
- 5) T2782 & T2802 - Fonterra A & Fonterra B (Industrial)

Once the Grid frequency has stabilised the System Operator will advise the Control Room when load can be restored.

### 8.3.6 Manual Feeder Shedding – Triggered by Grid Emergency

During a Grid Emergency, AUFLS feeders need to be retained in service in proportion to the remaining load off the GXP. Hence the feeder load shedding order should be followed to reduce load within the Grid Emergency GXP maximum demand targets.

Immediate actions to reduce demand are:

- Controllable hot water load to be shed at both GXPs and remain off until the Grid Emergency is over.
- Contact the Fonterra Te Awamutu Plant if they have any additional capacity to increase the output of the co-generation unit. Fonterra have undertaken to respond with best endeavours if they are able.

- If the above reductions do not reduce load within the GXP maximum demand targets, commence manual load shedding as per the below.

NOTE: Waipā Networks current takes 11kV supplies directly from Transpower's Cambridge and Te Awamutu GXP 11kV circuit breakers, with no operational control. Control Room will contact Transpower's Regional Control for breaker operation for Manual shedding and restoration.

Emergency load shedding feeders are listed below in order of importance. Feeders at each GXP are to be switched off in order from top to bottom, to reduce load to within the Grid Emergency GXP maximum demand target for each GXP:

#### Cambridge GXP feeders

Priority	GXP	Breaker #	Feeder Name	Classification	Average Loading (MW)	% of Load
1	CBG	C2852	St Kilda	Residential	1.68	3.06
2	CBG	C2802	Leamington	Residential	2.80	5.09
3	CBG	C2832	Cambridge East	Residential	2.19	3.98
4	CBG	C2722	Cambridge	Commercial	2.61	4.76
5	CBG	C2852	APL (open at	Industrial	0.88	1.61
6	CBG	C2762 & 2812	Hautapu A & B	Industrial	5.47	9.96

#### Te Awamutu GXP feeders

Priority	GXP	Breaker #	Feeder Name	Classification	Average Loading (MW)	% of Load
1	TMU	T2822	Ohaupo	Rural	1.33	2.42
2	TMU	T2742	Kihikihi	Residential	2.21	4.03
3	TMU	T0025	Te Awamutu	Residential	2.41	4.40
4	TMU	T2832	Te Awamutu	Commercial	1.98	3.61
5	TMU	T782 & T2802	Fonterra A & B	Industrial	0.67	1.23

Once the Grid Emergency is over the System Operator will advise the Control Room when load can be restored, starting with the feeders shed, then controllable hot water load. Once all Te Awamutu load is restored and the demand is stable, advise Fonterra Te Awamutu that they can return to normal co-generation operations.

### 8.3.7 Load Disconnection/Restoration Requirements

After receiving a direction from the System Operator, Waipā Networks (via WEL Control Room) will use the best endeavours to:

- Not increase or decrease its demand by more than 25 MW in any five-minute period without the System Operator's prior approval. Given the relatively small size of Waipā Networks' total load and individual feeder loads, this limit is unlikely to be breached.
- Minimise the impact on frequency and voltage stability. Given the relatively small size of Waipā Networks' total load and individual feeder loads, impacts on frequency and voltage are unlikely to be breached.
- Minimise the disconnection and restoration of its demand during times when demand is typically ramping up or down in the region affected by the supply shortage (for example, either side of morning and evening peaks). This will be considered in setting the timing of rolling outage plan actions.

## 8.4 Supply Restoration

Restoration of disconnected load must be restored in conjunction with the System Operator. This is to prevent overloading the Grid and Waipā Networks' network and/or creating further Grid instability.

## 8.5 Transmission Grid Emergency

The System Operator may request Waipā Networks to reduce load under a Grid Emergency notice (GEN), Control Room will advise System Operator and/or action accordingly:

- By default, Waipā Networks offer all its controllable hot water load to the Reserve Market through its agent. Control Room will advise System Operator accordingly.
- Waipā Networks will advise Control Room first if Waipā Networks' controllable hot water load is withdrawn from the Reserve Market, however this is rare. In this scenario, Control Room will shed all water heating load and inform the System Operator.

If more shedding is required, the System Operator will instruct Transpower to disconnect the load as per the emergency load-shedding feeders listed in Clause 8.3.6 of this PROP.

If a Developing Event is in place, the Grid Emergency will take precedence.

If the System Operator declares a supply shortage during a Grid Emergency, then Waipā Networks will respond by invoking rolling outages under the following sections 11 to 19, after the Grid Emergency has been remedied.

## 9 Developing Events

If the System Operator requests a load reduction for a Developing Event, Waipā Networks will reduce supply to meet the System Operator's weekly energy savings targets. To reduce energy use Waipā Networks will disconnect feeders in a controlled manner to enable targets to be reached.

Waipā Networks acknowledges there are financial penalties for not meeting the targets specified by the System Operator.

To avoid doubt, Waipā Networks will not institute prolonged water heating cuts separate to shedding un-controlled load to achieve energy savings.

## 10 Declaration of a Developing Event

The System Operator will endeavour to provide 9 days prior notice of the requirement for weekly energy savings and any increase in the weekly savings target.

The System Operator will then specify the energy savings target for a specific region for a specific time frame.

The System Operator is responsible for general media advertising of the need to conserve electricity and the impending rolling outages when they are requested if a Public Conservation Campaign has been declared in accordance with the Code.

On receipt of a declaration of a Developing event, Waipā Networks will update Appendix A with current load data.



## 11 Criteria for Rolling Outages

Both of Waipā Networks Network’s GXP’s will be included in rolling outages, as per the below:

Table 2: GXP’s affected by rolling outages

GXP	Rolling outages may occur	Reasons why rolling outages will not occur
CBG0111	Yes	Not applicable
TMU0111	Yes	Not applicable

Waipā Networks will use best endeavours to ensure public health and safety is preserved and costs to the economy are minimised. The following points have been noted when selecting feeders to be included in rolling outages:

- There are no major hospitals or international airports connected to Waipā Networks’ network.
- Waipā Networks’ main building has a standby generator.
- Waipā Networks District Council has generation sufficient to run both their Cambridge and Te Awamutu offices and utility plant sites.
- Te Awamutu Police Station has a generator sufficient to keep communications and the building running during rolling outages. Cambridge Police Station has been advised of the potential effects of rolling outages and that additional generation is recommended.
- All telecommunication major connections in the area have emergency generation.
- Waikeria Prison has emergency generation.
- Waipā Networks will liaise with Fonterra to voluntarily reduce the load in proportion with the System Operator energy saving targets in preference to rolling outages.
  - As a last resort, Waipā Networks will include Fonterra in rolling outages.
  - Waipā Networks will endeavour to schedule Fonterra’s Hautapu and Te Awamutu dairy factory outages at separate times.
- Where outages need to be increased above 4 hours, Waipā Networks will attempt to keep rural areas on 4-hour outages if possible, so that dairy farms may get at least one milk in each day.
- Predominantly rural and residential feeders will be included in rolling outages before commercial feeders. Commercial feeders will be added if required savings levels rise to the point where this is necessary.
- To assist contingency planning for local consumers and businesses, Cambridge outages will occur from 8 am to midday, while Te Awamutu outages will occur from midday to 4 pm where possible.

Waipā Networks has no agreements with retailers or consumers on the distributor’s network that may adversely affect the distributor’s ability to comply with system operator directions related to rolling outage plans.

## 11.1 Vulnerable Consumers and Priority Sites

Waipā Networks has interposed agreements with its Electricity Retailers and does not hold information about the locations or circumstances of vulnerable consumers and priority sites.

Therefore, Waipā Networks is unable to prevent rolling outages affecting vulnerable consumers and priority sites.

To minimise disruption Waipā Networks will;

- Provide information in its public notices and website alerting vulnerable consumers and priority sites of impending rolling outages, and
- Request all Electricity Retailers to notify their vulnerable consumers and priority site consumers.

## 12 AUFLS under Rolling Outages

The Code requires that the level of AUFLS at all times, including during rolling outages, needs to be maintained.

To achieve this Waipā Networks will request Transpower (as owner, operator, and maintainer of the AUFLS relays) to arm additional feeders as soon as rolling outages are planned to supplement the AUFLS load and exclude these from the rolling outage plan. If it is not possible to arm additional feeders before it is necessary to respond as directed, Waipā Networks will need to apply rolling outages to some high-priority feeders to achieve savings targets while maintaining AUFLS.

Note: as total load decreases during rolling outages the amount of load required for AUFLS will also decrease, some feeders reserved for AUFLS may be included in rolling outages and some feeders may need to be reassigned to meet requirements.

## 13 Shutdown Notification

When implementing a rolling outage plan, Waipā Networks will notify the outages in the following ways;

- Social media channels including Facebook, Instagram and LinkedIn
- Waipā Networks website, and
- Electricity Retailer notification.
- Customer Support team – will communicate with customers throughout.

### 13.1 Media

Waipā Networks will notify relevant media providing a rolling outage timetable showing the times and areas affected by rolling outages. The notification will provide details of Waipā Networks' website page for consumers who wish to seek more information.

### 13.2 Waipā Networks Website

Waipā Networks will provide information on the rolling outages including the timetable on their Outages website page.

### 13.3 Retailer Notification

Waipā Networks will provide all Electricity Retailers with the feeder rolling outage timetable and a schedule showing which feeder each ICP is connected to. This will assist retailers with consumers with identified health and safety issues.

Waipā Networks will endeavour to provide 7 days' notice of all rolling outage plans, generally publishing and issuing notifications on a Monday to apply from the following Monday.

## 14 Communication with System Operator

All communications with the System Operator will be between the WEL Control Room and Transpower's Regional Operating Centre (North) using Transpower's telephone or normal communication systems.

Before notifying and implementing a rolling outage plan, Waipā Networks will consult with the System Operator Security Coordinator to establish a process for shedding and restoration, which may include a MW load cap to operate under during restoration phases. Load shedding and restoration shall be no more than one feeder per GXP per 2.5 minutes per GXP unless otherwise agreed with Waipā Networks.

## 15 Grid Emergency during a Developing Event

If the System Operator declares a Grid Emergency during a Developing Event, the Grid Emergency will take priority.

As the water heating load is not intended to be used to reduce the load in a Developing Event, Waipā Networks would have a water heating load available for load reduction when required for the Grid Emergency. Once this load is shed, the System Operator will be advised. If more shedding

is required, the System Operator will instruct Transpower to disconnect the load as per the list of emergency load-shedding feeders in Clause 8.3.5 of this PROP.

After the Grid Emergency is cancelled by the System Operator the rolling outages pattern will resume.

## 16 Rolling Outages Strategy and Methodology

The GM Network Assets will manage the overall strategy of Waipā Networks’ rolling outages which will include reviewing weekly targets and preparing plans for weekly rolling outages based on savings required.

Waipā Networks’ methodology (subject to the percentage of energy savings requested by the System Operator) comprises;

- Classifying each of its feeders into rural, residential, and commercial (excluding Fonterra)
- Prioritising rolling outages on rural feeders then residential feeders and lastly commercial feeders
- Predetermining planned outage times,
- Maintaining AUFLS obligations,
- Load switching constraints, and
- Produce rolling outage plan.

### Feeder Classification:

Table 3: Feeders classified as Rural

GXP	Breaker #	Feeder Name	Classification	AVG feeder Load	% Load
CBG	C2732	Kaipaki	Rural	1.91	3.47
CBG	C2772	French Pass	Rural	2.12	3.86
CBG	C2742	Pencarrow	Rural	2.54	4.62
CBG	C2702	Roto-o-Rangi	Rural	2.22	4.05
CBG	C2852	St Kilda	Rural	1.68	3.06
TMU	T0022	Kawhia	Rural	1.4	2.60
TMU	T0024	Kiokio	Rural	1.69	3.08
TMU	T0029*	Pirongia*	Rural	2.17	3.95
TMU	T2762	Pukeatua	Rural	2.05	3.74
TMU	T0027	Paterangi	Rural	1.92	3.49
TMU	T2752	Mystery Creek	Rural	1.03	1.88
TMU	T2822	Ohaupo	Rural	1.33	2.42
TMU	T0023*	Pokuru*	Rural	1.84	3.34
<b>Total Rual Feeder Average Load</b>				<b>23.9</b>	
* Pirongia and Pokuru feeders will be relocated to other CB as indicated in					

Table 4: Feeders classed as residential

GXP	Breaker #	Feeder Name	Classification	AVG feeder Load	% Load
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CBG	C2802	Leamington	Residential	2.80	5.09
CBG	C2842	Tamahere	Residential	1.40	2.55
CBG	C2712	Cambridge North	Residential	1.32	2.40
CBG	C2832	Cambridge East	Residential	2.19	3.98
TMU	T0025	Te Awamutu West	Residential	2.41	4.40
TMU	T2742	Kihikihi	Residential	2.21	4.03
<b>Total Residential Feeder Average Load</b>				<b>12.33</b>	

Table 5: Feeders classed as commercial

GXP	Breaker #	Feeder Name	Classification	AVG feeder Load	% Load
CBG	C2722	Cambridge Town	Commercial	2.61	4.76
CBG	C2862	Monavale	Commercial	2.92	5.33
TMU	T2832	Te Awamutu East	Commercial	1.98	3.61
TMU	T2852	Waikeria	Commercial	1.17	2.13
TMU	T0026	Hairini	Commercial	2.41	4.40
<b>Total- Commercial Feeder Average Load</b>				<b>11.09</b>	

Table 6: Feeders classed as industrial

GXP	Breaker #	Feeder Name	Classification	AVG feeder Load	% Load
CBG	C2762	Hautapu A	Industrial	2.69	4.89
CBG	C2812	Hautapu B	Industrial	2.78	5.07
CBG	C2872	APL	Industrial	0.88	1.61
TMU	T2782	Fonterra A	Industrial	0.63	1.15
TMU	T2802	Fonterra B	Industrial	.04	0.08
<b>Total Industrial Feeder Average Load</b>				<b>7.02</b>	

#### Prioritising Rolling Outages:

- Predominantly rural and residential feeders will be included in rolling outages before commercial feeders. Commercial feeders will be added if required savings levels rise to the point where this is necessary.

#### Predetermining Planned Outage Times:

- To assist contingency planning for local consumers and businesses, where possible Cambridge outages will occur from 8am till midday, while Te Awamutu outages will occur from midday till 4pm,
- Where planned outages need to be longer than four hours to achieve the energy saving requested by the System Operator, Waipā Networks will endeavour to programme the outages during daylight hours, between 7am and 6pm.
- Fonterra have dedicated feeders at Cambridge GXP and Te Awamutu GXP. Waipā Networks will endeavour to schedule Fonterra's Hautapu and Te Awamutu dairy factory site outages at separate times.

Maintaining AUFLS Obligations:

- The Code requires that the level of AUFLS at all times, including during rolling outages, needs to be maintained,
- To achieve this Waipā Networks will request Transpower (as owner, operator and maintainer the AUFLS relays) to arm additional feeders as soon as rolling outages are planned to supplement the AUFLS load and exclude these from the rolling outage plan.
- Rolling outages will only be applied to active AUFLS feeders to the extent that it is possible to continue to meet AUFLS obligations.

Load Switching Constraints:

- Unless advised otherwise by the System Operator, the rolling outages plan must provide sufficient time for switching of load to ensure that Waipā Networks' load does not increase or decrease by more than 25MW in any 5-minute period as stipulated by the System Operator. The System Operator carrying out switching will monitor their activities in relation to this limit.
- The Control Room will ensure that load shedding and restoration shall be no more than one feeder per GXP per 2.5 minutes unless otherwise agreed with the GM Network.
- If Waipā Networks is unable to meet the load disconnection/restoration ramp rates for a valid operational reason, or if Waipā Networks predicts there is likely to be a material departure (greater than 20%) from the previously provided half-hourly GXP load forecast/load profile, then Waipā Networks will advise the System Operator to ensure that real-time security issues can be managed.

Produce rolling outage plan:

- Having established the nine-day ahead rolling outage plan and despite significant uncertainty in predicting consumer behaviour during these types of events, Waipā Networks will endeavour to produce a rolling nine-day ahead half-hourly load prediction for each GXP provided daily. This will be updated daily to reflect any adjustments to Waipā Networks' plan and forwarded to the System Operator in the format outlined below.

Date: (table for each of the next 7 days)		
Trading Period	Cambridge GXP	Te Awamutu GXP
1	MW load	MW load
2	MW load	MW load
↓	MW load	MW load
48	MW load	MW load

Upon receipt of a direction from the System Operator to initiate rolling outages, an acknowledgement of receipt of that direction will be sent by WEL Control to the System Operator by e-mail.

Disconnection and restoration of demand in real-time by WEL Control will be in accordance with the rolling outage plan and will remain within the load-switching constraints identified above.

## 16.1 Indicative Rolling Outage Plans

Using the methodology outlined in Clause 16.0 above, Waipā Networks’ indicative plans for 5% - 25% energy savings are:

5% Savings Schedule			
Group	Cuts per week	Cut Duration (h)	Weekly Savings (MWh)
Rural	5	4	478
Residential	0	0	0
Commercial	0	0	0
Industrial			
Average weekly winter volume			9,221
Estimated percentage savings			5.18%

10% Savings Schedule			
Group	Cuts per week	Cut Duration (h)	Weekly Savings (MWh)
Rural	5	5	598
Residential	6	5	370
Commercial	0	0	0
Industrial			
Average weekly winter volume			9,221
Estimated percentage savings			10.5%

15% Savings Schedule			
Group	Cuts per week	Cut Duration (h)	Weekly Savings (MWh)
Rural	7	5	836
Residential	7	5	431
Commercial	4	3	133
Industrial			
Average weekly winter volume			9,221
Estimated percentage savings			15.2%

20% Savings Schedule			
Group	Cuts per week	Cut Duration (h)	Weekly Savings (MWh)
Rural	7	6	1003
Residential	4 3	6 8	591
Commercial	6	4	266
Industrial			
Average weekly winter volume			9,221
Estimated percentage savings			20.2%

25% Savings Schedule			
Group	Cuts per week	Cut Duration (h)	Weekly Savings (MWh)
Rural	7	6	1003
Residential	7	8h	690
Commercial	7	8h	621
Industrial			
Average weekly winter volume			9,221
Estimated percentage savings			25.1%





## 17 Target Monitoring

The Engineering Manager will be responsible for daily and weekly reporting of consumption relative to target levels to the System Operator for operational purposes, and, to the System Operator for assessing compliance using Waipā Networks' data sources.

To avoid discrepancies over the accuracy of different data sources, the System Operator will reconcile actual demand versus the target using actual market information not available to Waipā Networks during these events.

For load shedding to a weekly target, Waipā Networks' Engineering Manager will monitor the System Operator report on Waipā Networks' savings against the target and in conjunction with the Network Asset Manager, review future load shedding to increase or decrease the amount of rolling outages to enable the weekly target to be met.

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 GM Network in conjunction with the Engineering Manager will monitor Waipā Networks' savings and adjust accordingly in the timeframe required. These savings will be calculated using GXP loads measured by our SCADA system and compared with the targets supplied by the System Operator.

## 18 Log of Rolling Outages

The Control Room will enter in the Rolling Outage Log, the times of disconnection and reconnection of all feeder interruptions. The log sheet to be used by the Control Room is shown in Appendix A.

## 19 Contingent Events

If any unplanned event outside of this PROP occurs that will alter planned rolling outages, the Control Room will be responsible for all decisions. Where possible, any changes to the planned timetable should be published on Waipā Networks' website and communicated to all Electricity Retailers.

## 20 Appendix A – Rolling Outage Log

The operating order used to carry out the switching for rolling outages can be used as a log and exported to PDF or Excel. However, failing that the below table can be used to record outages.

GXP \_\_\_\_\_ DATE \_\_\_\_ / \_\_\_\_ / \_\_\_\_

TOTAL MW OFF \_\_\_\_\_ ON \_\_\_\_\_

FEEDER NAME	CIRCUIT BREAKER #	TIME OPENED	TIME CLOSED	INITIAL


## 21 Appendix B – Rolling Outage Media Notification (Draft)

### Electricity Supply Interruptions

Waipā Networks Ltd is required to reduce electricity consumption with rolling power outages across Cambridge, Te Awamutu and surrounding rural areas to meet a (5% or 10% or 15% or 20% or 25%) energy savings target set by the System Operator in response to the current energy crisis.

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

Outages will occur within the time periods shown below. Wherever possible, Waipā Networks will delay cuts and restore power early, **so please treat all lines as live.**

Waipā Networks has prioritised the feeders that will be turned off to minimise the inevitable disruption and cost to the community.

To find out the feeder for your connection, you can call your electricity retailer.

#### YOUR SAFETY AND PROTECTION

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

- Power may be restored at any time.
- Please ensure all appliances are turned off during power cuts, particularly ovens, cook tops and heaters.
- To prevent damage to computers and other electrical equipment please ensure that you turn the switch off at the wall prior to outages.

#### IS YOUR HEALTH RELIANT ON POWER?

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

All other electricity distribution networks are likely to have similar outages. If you are travelling, some traffic lights may not be working. Avoid using lifts during these power restrictions.

EXAMPLES ONLY

Feeder Area	Monday 30 June 2024	Tuesday 1 July 2024	Wednesday 2 July 2024	Thursday 4 July 2024	Friday 5 July 2024	Saturday 6 July 2024
Kaipaki Tamahere	8am-12pm		8am-12pm		8am-12pm	
French Pass Roto-O-Rangi		8am-12pm		8am-12pm		8am-12pm
Kawhia Kiokio Waikeria Pirongia Pukeatua Paterangi	12pm-4pm		12 pm-4 pm		12pm-4pm	
Kihikihi Mystery Creek Ohaupo Pokuru		12 pm-4 pm		12 pm-4pm		12pm-4pm

(Note: only general areas are listed, some nearby areas will be affected)

Consumers on feeders other than those listed are not scheduled for rolling outages in this period.