

## Marlborough Lines

# Security of Supply – Participant Rolling Outage Plan

### DOCUMENT ISSUE STATUS

Issue	Section	Page	Revision Detail	Reviewed By	Approved By	Date
A	All	All	Convert to new template and update tables	I. Anderson		23/06/2021
A.1	All	All	Re-arrange headings and ensure compliance with TP PROP guidelines.	B. Sutherland	W. Nichol	14/07/2021
A.2	All	All	Added tables for 25% energy savings target; updated contact information; updated wording of Section 6.6.	M. Curnow	W. Nichol	19/11/2021
A.3	4.2.1 7.2	7 11	Changed circuit names for 33kV feeders included in AUFLS scheme; Introduced CIMS framework and assigned tasks to each role.	M. Curnow	W. Nichol	12/12/2023

## TABLE OF CONTENTS

1	General .....	4
1.1	Purpose.....	4
1.2	Definitions .....	4
1.3	MLL Associated Quality Procedures.....	5
2	Background.....	5
2.1	System Operator .....	5
2.2	Transpower .....	5
2.3	Marlborough Lines (MLL) .....	5
3	Supply and Demand.....	5
3.1	Load Reduction by MLL .....	6
3.2	Range of Events.....	6
3.3	Significant Incident.....	6
4	Actions for Immediate events .....	6
4.1	Reserve Market .....	6
4.2	Disconnecting Customers.....	7
4.2.1	Automatic Under Frequency Load Shedding (AUFLS) .....	7
4.2.1.1	AUFLS Zone 1 .....	7
4.2.1.2	AUFLS Zone 2 .....	7
4.3	Supply Restoration .....	7
4.4	System Operator Supply Shortage Declaration .....	7
4.5	Transmission Grid Emergency.....	7
5	Developing Events .....	8
5.1	Declaration of a Developing Event.....	8
6	Criteria for Rolling Outages .....	8
6.1	AUFLS Criteria.....	9
6.2	Shutdown Notification .....	10
6.3	Vulnerable Customers and Priority Sites .....	10
6.4	Retailer Agreements.....	10
6.5	Grid emergency During a Developing event .....	10
6.6	Supply Restoration .....	10
7	Communication .....	10
7.1	Communication with System Operator .....	11
7.2	MLL Employee Responsibilities .....	11

7.3 Communication with Marlborough Lines .....11

8 Rolling Outages Strategy and Methodology .....12

8.1 Methodology .....12

8.2 Target Monitoring .....19

8.3 Log of Rolling Outages .....19

8.4 Contingent Events .....19

8.5 Customer Liaison .....19

8.6 Vulnerable Consumers .....19

Appendix A: Outage Log .....20

Appendix B: Draft Rolling Outage Public Notice .....21

# 1 General

## 1.1 Purpose

This plan was written to comply with the System Operator’s Rolling Outage Plan (SOROP).

Under the regulations, Participant Rolling Outage Plans (PROP) are required to specify the actions that would be taken to reduce the consumption of electricity:

- When a supply shortage is declared by the System Operator;
- To comply with requirements of the System Operator’s Rolling Outage Plan (SOROP);
- To comply with Electricity Industry (Enforcement) Regulations 2010, Electricity Industry Participation Code 2010 and subsequent amendments; and
- To supplement the System Operator’s Rolling Outage Plan.

Reducing demand by disconnecting supply to consumers would be a last resort after all other forms of savings, including voluntary savings, had been employed. Marlborough Lines (MLL) will always endeavour to keep consumers supplied. MLL will only disconnect consumers when directed to by the System Operator.

The procedures outlined are in response to major generation shortages including dry year scenarios. 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. How these would be structured and implemented is discussed.

## 1.2 Definitions

The following definitions are referred to in this document:

Definition	Explanation
AUFLS	Automatic under frequency load shedding
EDN	Electrical Distribution Network
Electricity Act	Electricity Act 1992 and subsequent amendments
Feeder	A high voltage circuit originating from a substation or GXP
GXP	Transpower grid exit point
GEN	Grid emergency notice
GM	General Manager
MLL	Marlborough Lines Ltd
NGOC	National Grid Operations Centre
PROP	Participant rolling outage plan (this plan)
Regulations	Electricity Industry Participation Code 2010 and amendments, Electricity Industry (enforcement) Regulations 2010, Electricity Governance Regulations 2008 and amendments
Retailers	Electricity retail companies

Rolling outages or rolling cuts	Planned electricity disconnections spread over different parts of the network at different times to avoid prolonged outages at any one location
SOROP	System Operator’s rolling outage plan
Supply shortage declaration	Declaration made by the System Operator under Part 9 of the Electricity Industry Participation Code (EIPC)
System operator	Operator of the national electricity transmission grid
WRN	Warning notice

### 1.3 MLL Associated Quality Procedures

PR69	Outage Data Processing
PR22	Emergency Preparedness and Response
PR7	Communications & Media

## 2 Background

### 2.1 System Operator

The System Operator is a Crown entity set up under the Electricity Act to oversee New Zealand’s electricity industry and markets. A function of the System Operator under the Electricity Act is to use reasonable endeavours to ensure the security of electricity supply. The System Operator’s activities include forecasting supply and demand, developing and publishing guideline hydro levels for security of supply, and contracting for reserve energy.

### 2.2 Transpower

Transpower is a State-Owned Enterprise which owns and operates New Zealand’s National Grid - the network of high voltage transmission lines and substations that transports electricity from where it is generated to distribution line companies, such as Marlborough Lines through the Grid Exit Point (GXP) located at Blenheim. As System Operator, Transpower manages the real-time operation of New Zealand's electricity transmission system. It keeps the right amount of energy flowing to match generated supply with demand.

### 2.3 Marlborough Lines (MLL)

MLL is the electricity network company that owns and maintains the electricity lines, cables and substations that deliver electricity to consumers in the Marlborough region.

## 3 Supply and Demand

Transpower, as the System Operator, controls the transmission network to match generation with consumer demand. Constraints on the ability to manage this may be caused by:

1. Low lake levels reducing hydro generation
2. Failure of a large generator
3. Insufficient generation offers into the market
4. A fault on critical transmission circuit

The first three causes above could lead to an energy shortage, while the fourth could lead to a shortage of transmission capacity.

### **3.1 Load Reduction by MLL**

MLL has some ability to reduce load by turning off domestic water heaters via ripple control in the Marlborough region. This will be the first load reduction method and will be applied to all customers on a controlled hot water tariff. Further load reductions would require disconnecting consumers.

### **3.2 Range of Events**

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

1. Developing event = events that evolve over time, for example low hydro lake levels
2. Immediate event = events that occur with little or no warning, usually as a result of a transmission line or major generation failure. Also known as a Grid Emergency.

### **3.3 Significant Incident**

Either event will be classed by MLL as a significant incident and the General Manager (GM) Network Operations will assemble a team of senior managers and employees to manage the incident. Communication with retailers will be as per normal notification procedures described in Marlborough Lines' PR69 Outage Data Processing. Local Authorities, Civil Defence and other stakeholders will be notified of significant events by the Customer Services Team under direction of the GM Network Operations.

## **4 Actions for Immediate events**

Transpower, as the System Operator, is required to keep enough reserve generation to cover the risk of the largest connected generator tripping (or HVDC link failure). They are also required to keep the system frequency at 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 complete failure of the electricity network.

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 load in stages until the frequency stabilises.

### **4.1 Reserve Market**

Generators and load users with interruptible load, such as distribution networks, 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. MLL does not currently participate in this market.

## 4.2 Disconnecting Customers

### 4.2.1 Automatic Under Frequency Load Shedding (AUFLS)

Each distribution network company must have available at all times two blocks of load, each of 16% of its total load at the time to be shed by automatic under frequency relays. In the South Island Transpower has installed these relays on selected 33kV feeders at the GXP's and the total load at the selected MLL zone substations is disconnected when Transpower trips those 33kV feeders.

#### 4.2.1.1 AUFLS Zone 1

If system frequency fails to recover after reserve market load shed, AUFLS Zone 1 shedding by Transpower will occur. This will drop 16% of MLL's load by disconnecting customers supplied on the following 33kV feeders:

Feeder	Circuit Name
CB2032	BLN-LVY
CB2152	BLN-JCK

#### 4.2.1.2 AUFLS Zone 2

If Zone 1 tripping fails to restore frequency, the next stage, Zone 2 activates. Transpower would disconnect a further 16% of MLL load on the following 33kV feeders:

Feeder	Circuit Name
CB2052	BLN-SCK-TUA-2
CB2162	BLN-SPL-3
CB2232	BLN-SCK-TUA-1

## 4.3 Supply Restoration

Restoration of disconnected load must be restored in conjunction with the System Operator where it could exceed a 25MW step change. This is to prevent overloading the transmission network and creating further instability.

MLL zone substations shall each be livened in a controlled manner, ensuring transformer tap changers maintain the 11kV bus voltage. This could require large 11kV feeders to be restored one at a time.

## 4.4 System Operator Supply Shortage Declaration

For some immediate events, the System Operator may declare that rolling outages are required to be implemented. In such a situation, the procedures for **developing** events will need to be implemented as per section 5.

## 4.5 Transmission Grid Emergency

The System Operator may request MLL to reduce load under a grid emergency notice (GEN). MLL would shed any water heating load not already off and then, if necessary, shed feeders in order of lowest to highest priority until the load reduction is met. The feeder priority list is located in MLL's Emergency Preparedness Plan, Appendix 2.

If an **immediate** event is in place, the grid emergency will take precedence.

## 5 Developing Events

If the System Operator requests a load reduction for a **developing** event, MLL would reduce demand to meet the System Operator's targets. The targets are expected to be a weekly energy savings target that is reviewed each week. To reduce energy usage MLL would disconnect HV feeders (rolling outages, Section 8) in a controlled manner to enable targets to be reached. There may be financial penalties for not meeting the targets specified by the System Operator. The shedding of water heating load alone is not a viable option for energy savings as this only defers usage and would not save energy.

### 5.1 Declaration of a Developing Event

The System Operator will endeavour to provide nine days prior notice of the requirement for weekly energy savings. It is MLL's plan to use the standard planned outage notification procedure to retailers as detailed in Marlborough Lines' PR69 Outage Data Processing. Any increase in the weekly energy savings target would also need nine days prior notice.

If the System Operator declares a supply shortage and directs rolling outages, it will request that a specific weekly energy savings target was to be enforced for a specific region for a specified timeframe. A notification system like the GEN procedure would be appropriate. The System Operator is expected to manage general media advertising of the need to conserve electricity and the impending rolling outages when they are requested.

## 6 Criteria for Rolling Outages

To ensure public health and safety is preserved and costs to economy are minimised, Table 1 shows a desired criterion for selecting feeders to be included in rolling outages.

These priorities are intended as guidelines, and because rolling outages will be implemented on a feeder by feeder basis, it is not possible to discriminate between individual consumers on the same feeder. For example, a predominantly residential feeder may also have small pockets of commercial or industrial consumers.



Table 1: Priority loads

Priority	Priority Concern	Maintain Supply to
1	Public health and safety	Major hospitals, air traffic control centres, and emergency operation centres
2	Important public services	Energy control centres, communication networks, water & sewage pumping, fuel delivery systems, and major ports
3	Public health and safety	Minor hospitals, medical centres, rest homes, schools, and wineries (harvest periods)
4	Food production and storage	Agricultural and farming areas, cool stores, and wineries (non-harvest periods)
5	Domestic production	Commercial and industrial premises
6	Disruption to households	Residential premises

The priority for each feeder will be based on the weighted average of the priorities assigned to individual consumers within the feeder. Rather than assigning feeder priorities based on absolute weighted average values, feeders will be ranked relative to each other and distributed across the priority groups, as shown in Table 2. This provides a more even spread of feeders across the priority groups, minimising the clustering effect that would be expected otherwise.

Table 2 Priority Criteria

Priority	Criteria
1	Any feeder with one or more Priority 1 connections. Excluding those already allocated to Priority 1, the remaining feeders are ranked (lowest to highest priority) based on their weighted average. The list is then split so that approximately 10-15 feeders are in each Priority Group.
2	
3	
4	
5	
6	

Rolling outage plans will focus on lower priority feeders to the extent possible, and the higher priority feeders being selected only at the higher required savings levels.

GXPs for rolling outages on the MLL network are:

Table 3: GXPs where rolling outages will occur

GXP	Rolling outages may occur	Reasons why rolling outages will not occur
BLN	Y	N/A

### 6.1 AUFLS Criteria

Currently, the same criteria for rolling outages as shown in Table 1 are also used to select 33kV feeders (zone substations) for AUFLS tripping. Thus, AUFLS load blocks are predominantly from lower priority load categories however some higher priority consumers would also be affected. As the load levels reduce, some of the feeders with AUFLS connected can be used while still

maintaining the 16% and 32% AUFLS shedding criteria. To minimise the effect of AUFLS exclusion during rolling outages, the shifting of AUFLS to high priority zone substations will be considered.

When a **developing** event is declared, then Transpower could be requested to change the AUFLS blocks to alternative feeders. It is considered prudent to consider exposing high priority consumers to a low probability short term event, such as AUFLS, rather than have them included in rolling outages.

If it is not possible to change the AUFLS blocks in the timeframe to implement rolling outages, it will be necessary to include some high priority feeders in the rolling outages, especially for higher saving targets.

## 6.2 Shutdown Notification

When requested to reduce demand with rolling outages, MLL plans to use the planned outage procedure as per Marlborough Lines' PR69 Outage Data Processing to advise retailers in advance of pending outages. The time and extent of advertised outages will be approximate.

## 6.3 Vulnerable Customers and Priority Sites

MLL will endeavour to give retailers as much advance notice as possible of pending rolling outages to enable them to notify vulnerable consumers.

## 6.4 Retailer Agreements

Currently MLL do not have any agreements with retailers or consumers which would adversely affect our ability to comply with System Operator directions.

## 6.5 Grid emergency During a Developing event

If the System Operator declares a grid emergency during a **developing** event, the grid emergency will take priority. If water heating load has not all been shed, then the remainder will be shed. The rolling outage feeders may have to be increased or rearranged to comply with the grid emergency. After the grid emergency is over, the rolling outages pattern would continue.

## 6.6 Supply Restoration

Disconnected load must be restored in conjunction with the System Operator. This is to prevent overloading the transmission network and creating instability. The System Operator has advised that load changes of less than 25 MW in any five minutes may be implemented by a network without their prior approval. The supply restoration method must use best endeavours to minimise the impact on frequency and voltage stability and minimise disconnection and restoration during times when demand is typically ramping up or down in the region (e.g. either side of morning and evening peaks).

# 7 Communication

MLL will keep local media and consumers informed of planned interruptions to supply before and during the outages. Media will be informed as per MLL standard communications procedure PR7, and the retailers will be responsible for planned shutdown consumer notification.

The System Operator is expected to manage general media advertising of the need to conserve electricity and the impending rolling outages when they are requested.

### 7.1 Communication with System Operator

All communications with the System Operator will be using Transpower’s NGOC phone number. Prior to notifying and implementing rolling outages, MLL will consult with the System Operator to establish a process for load shedding and restoration.

### 7.2 MLL Employee Responsibilities

MLL’s response framework is based on the Coordinated Incident Management System (CIMS). When activated by a critical incident or emergency, MLL will form an Incident Management Team headed up by an Incident Controller and supported by specialist CIMS roles as required. Should this PROP need to be implemented, Table 4 sets out the expected team structure and responsibilities.

Table 4: MLL Incident Management Team Responsibilities

Task	CIMS Role
Receive communication from System Operator and send acknowledgement	Incident Controller
Reporting to System Operator	Incident Controller
Revoking rolling outages	Incident Controller
Implement this plan	Intelligence / Planning
Weekly savings reporting	Intelligence
Retailer notification	Public Information Management
Reporting to media, public agencies	Public Information Management

### 7.3 Communication with Marlborough Lines

The System Operator can contact MLL using the following details:

Table 5: Contact Details of MLL Personnel

	Key Contact for Operational Matters	Key Contact for Administrative Matters
Title	GM Network Operations	Commercial Manager
Name	Warner Nichol	Scott Wilkinson
Email	<a href="mailto:warner.nichol@mll.co.nz">warner.nichol@mll.co.nz</a>	<a href="mailto:scott.wilkinson@mll.co.nz">scott.wilkinson@mll.co.nz</a>
Phone	03 579 3812 / 027 476 1805	03 579 3824 / 021 192 5073
Address	1 Alfred St, PO Box 144, Blenheim 7240	

Table 6: Contact Details of MLL Head Office

	MLL Head Office
Email	<a href="mailto:info@mll.co.nz">info@mll.co.nz</a>
Phone	03 577 7007
Address	1 Alfred St, PO Box 144, Blenheim 7240

#### Outside Work Hours

After hours Network Controller: 03 579 3852

Duty Manager: 03 579 3805

Within one day of the System Operator declaring a supply shortage the GM Network Operations will notify the System Operator of the updated contact details including telephone numbers and email address for each of the positions named in Table 5.

MLL will contact the System Operator’s Emergency Response Project Manager for administration purposes (including reporting performance against targets) using the following details:

**System Operator**

Phone 04 590 7000

22 Boulcott Street

PO Box 1021

Wellington

## 8 Rolling Outages Strategy and Methodology

The GM Network Operations and Commercial Manager together with the Control Room Manager will review weekly targets and prepare plans for weekly rolling outages based on savings required. The plans will be forwarded to the retailers for consumer and media notification.

### 8.1 Methodology

- a) GM Network Operations will acknowledge they have received the direction to save energy by return email to the System Operator.
- b) In the nine days from notice until energy savings must commence, the Control Room Manager will ensure load shedding schedules are prepared, operator rosters are adjusted as required, and load is controlled and monitored to meet desired targets. Schedules of daily week ahead forecasts of estimated load shedding, restoration times and quantities will be provided to the security coordinator (at the System Operator) and variations of +/- 20% will be advised to the System Operator.
- c) Each distribution feeder exiting a zone substation (or switching station) will be named as a “Rolling outage feeder”.
- d) Rolling outage feeders will be assigned a priority according to the criteria specified in section 6. Feeders that belong to AUFLS block 1 and 2 will be excluded from rolling outage groups where possible.
- e) A plan will be prepared to target the required savings level, taking account of any under or over savings carried forward from earlier periods in the security of supply rolling outage plan. Groups should be selected depending on the saving level required, as follows:

*Table 7: Savings level required*

Savings Required	Priority Groups used
≤ 5%	5 to 6
> 5 to ≤ 10	3 to 6
> 10%	2 to 6

- f) MLL will endeavour to keep rolling outages to any consumer no longer than 4 hours per day. However for more than 5% energy savings, longer and more frequent outages may be necessary.
- g) Outages will be programmed between 0800 and 1800 on all days. Night-time is excluded from the cut period for safety reasons. Initially outages will be scheduled for mid-afternoon to limit the economic effects. Timing of outages will be approximate and could vary daily due to network or System Operator constraints.
- h) Once System Operator has advised the system is stabilised and energy savings are no longer required, restoration of demand will occur with no change greater than 25MW in any five-minute period. The supply restoration method must minimise the impact on frequency and voltage stability and minimise disconnection and restoration during times when demand is typically ramping up or down in the region (e.g. either side of morning and evening peaks).
- i) During the rolling outage, the network controller will monitor loading and ensure the plan is meeting energy saving requirements and in consultation with the GM Network Operations will adjust the plan accordingly if required. It is not known how consumer behaviour will change during these types of events, therefore MLL will revise our forecast weekly savings plans during any event.

With the significant change in load profiles between Summer and Winter periods we consider it prudent to identify the level of feeder outages for both periods. These are defined in Table 8 – Table 17:

Table 8: 5% Energy Savings during MLL Summer Period

Summer - Energy Savings (MWh)															Time Off per day (Hours)	Daily Savings (MWh)	Days Off per Week	Weekly Savings (MWh)
Priority Group	Hour of the Day (7 = 07:00 - 07:59; 17 = 17:00 - 17:59)																	
	6	7	8	9	10	11	12	13	14	15	16	17	18	19				
1	No outages before 08:00												No outages after 18:00		0.00	0.00	0	0.00
2														0.00	0.00	0	0.00	
3														0.00	0.00	0	0.00	
4														0.00	0.00	0	0.00	
5											2.97	6.22		6.27	2.48	15.46	7	108.22
6										8.57	8.81	9.60		11.11	4.00	38.08	7	266.59
<b>Weekly Savings (MWh)</b>																	<b>374.82</b>	
<b>MLL Typical Usage (MWh)</b>																	<b>7495.15</b>	
<b>Percentage Savings (%)</b>																	<b>5.00%</b>	

Table 9: 5% Energy Savings during MLL Winter Period

Winter - Energy Savings (MWh)															Time Off per Day (Hours)	Daily Savings (MWh)	Days Off per Week	Weekly Savings (MWh)
Priority Group	Hour of the Day (7 = 07:00 - 07:59; 17 = 17:00 - 17:59)																	
	6	7	8	9	10	11	12	13	14	15	16	17	18	19				
1	No outages before 08:00												No outages after 18:00		0.00	0.00	0	0.00
2														0.00	0.00	0	0.00	
3														0.00	0.00	0	0.00	
4														0.00	0.00	0	0.00	
5												3.94		5.72	1.76	9.67	7	67.67
6										9.44	9.92	12.00		15.63	4.00	46.99	7	328.92
<b>Weekly Savings (MWh)</b>																	<b>396.58</b>	
<b>MLL Typical Usage (MWh)</b>																	<b>7937.25</b>	
<b>Percentage Savings (%)</b>																	<b>5.00%</b>	

*Table 10: 10% Energy Savings during MLL Summer Period*

<b>Summer - Energy Savings (MWh)</b>																				
Priority Group	Hour of the Day (7 = 07:00 - 07:59; 17 = 17:00 - 17:59)														Time Off per day (Hours)	Daily Savings (MWh)	Days Off per Week	Weekly Savings (MWh)		
	6	7	8	9	10	11	12	13	14	15	16	17	18	19						
1	No outages before 08:00														No outages after 18:00	0.00	0.00	0	0.00	
2																0.00	0.00	0	0.00	
3																	0.00	0.00	7	0.00
4										8.06	12.60	11.88	11.66				3.63	44.19	7	309.35
5										6.16	6.18	6.22	6.27				4.00	24.84	7	173.85
6										8.57	8.81	9.60	11.11				4.00	38.08	7	266.59
															<b>Weekly Savings (MWh)</b>		<b>749.79</b>			
															<b>MLL Typical Usage (MWh)</b>		<b>7495.15</b>			
															<b>Percentage Savings (%)</b>		<b>10.00%</b>			

*Table 11: 10% Energy Savings during MLL Winter Period*

<b>Winter - Energy Savings (MWh)</b>																				
Priority Group	Hour of the Day (7 = 07:00 - 07:59; 17 = 17:00 - 17:59)														Time Off per Day (Hours)	Daily Savings (MWh)	Days Off per Week	Weekly Savings (MWh)		
	6	7	8	9	10	11	12	13	14	15	16	17	18	19						
1	No outages before 08:00														No outages after 18:00	0.00	0.00	0	0.00	
2																0.00	0.00	0	0.00	
3													7.28				0.59	7.28	7	50.97
4										10.22	9.89	9.12	9.01				4.00	38.24	7	267.67
5										5.01	5.01	5.19	5.72				4.00	20.93	7	146.48
6										9.44	9.92	12.00	15.63				4.00	46.99	7	328.92
															<b>Weekly Savings (MWh)</b>		<b>794.04</b>			
															<b>MLL Typical Usage (MWh)</b>		<b>7937.25</b>			
															<b>Percentage Savings (%)</b>		<b>10.00%</b>			

Table 12: 15% Energy Savings during MLL Summer Period

Summer - Energy Savings (MWh)															Time Off per day (Hours)	Daily Savings (MWh)	Days Off per Week	Weekly Savings (MWh)	
Priority Group	Hour of the Day (7 = 07:00 - 07:59; 17 = 17:00 - 17:59)													18					19
	6	7	8	9	10	11	12	13	14	15	16	17	18	19					
1	No outages before 08:00												No outages after 18:00		0.00	0.00	0	0.00	
2															0.00	0.00	7	0.00	
3												5.92		9.23		1.70	15.14	7	106.00
4										12.79	12.60	11.88		11.66		4.00	48.93	7	342.48
5					6.38	6.38				6.16	6.18	6.22		6.27		6.00	37.59	7	263.15
6					10.70	10.12				8.57	8.81	9.60		11.11		6.00	58.91	7	412.34
<b>Weekly Savings (MWh)</b>																	<b>1123.97</b>		
<b>MLL Typical Usage (MWh)</b>																	<b>7495.15</b>		
<b>Percentage Savings (%)</b>																	<b>15.00%</b>		

Table 13: 15% Energy Savings during MLL Winter Period

Winter - Energy Savings (MWh)															Time Off per Day (Hours)	Daily Savings (MWh)	Days Off per Week	Weekly Savings (MWh)	
Priority Group	Hour of the Day (7 = 07:00 - 07:59; 17 = 17:00 - 17:59)													18					19
	6	7	8	9	10	11	12	13	14	15	16	17	18	19					
1	No outages before 08:00												No outages after 18:00		0.00	0.00	0	0.00	
2															0.00	0.00	7	0.00	
3											4.56	10.19		12.34		2.48	27.09	7	189.66
4										10.22	9.89	9.12		9.01		4.00	38.24	7	267.67
5					5.69	5.55				5.01	5.01	5.19		5.72		6.00	32.17	7	225.21
6					13.33	12.21				9.44	9.92	12.00		15.63		6.00	72.52	7	507.67
<b>Weekly Savings (MWh)</b>																	<b>1190.21</b>		
<b>MLL Typical Usage (MWh)</b>																	<b>7937.25</b>		
<b>Percentage Savings (%)</b>																	<b>15.00%</b>		



Table 14: 20% Energy Savings during MLL Summer Period

Summer - Energy Savings (MWh)															Time Off per day (Hours)	Daily Savings (MWh)	Days Off per Week	Weekly Savings (MWh)	
Priority Group	Hour of the Day (7 = 07:00 - 07:59; 17 = 17:00 - 17:59)													18					19
	6	7	8	9	10	11	12	13	14	15	16	17	18	19					
1	No outages before 08:00														No outages after 18:00	0.00	0.00	0	0.00
2													7.46			0.94	7.46	7	52.23
3										8.74	8.67	8.45	9.23			4.00	35.09	7	245.61
4					13.00	13.15				12.79	12.60	11.88	11.66			6.00	75.08	7	525.53
5					6.38	6.38				6.16	6.18	6.22	6.27			6.00	37.59	7	263.15
6					10.70	10.12				8.57	8.81	9.60	11.11			6.00	58.91	7	412.34
																<b>Weekly Savings (MWh)</b>		<b>1498.86</b>	
																<b>MLL Typical Usage (MWh)</b>		<b>7495.15</b>	
																<b>Percentage Savings (%)</b>		<b>20.00%</b>	

Table 15: 20% Energy Savings during MLL Winter Period

Winter - Energy Savings (MWh)															Time Off per Day (Hours)	Daily Savings (MWh)	Days Off per Week	Weekly Savings (MWh)	
Priority Group	Hour of the Day (7 = 07:00 - 07:59; 17 = 17:00 - 17:59)													18					19
	6	7	8	9	10	11	12	13	14	15	16	17	18	19					
1	No outages before 08:00														No outages after 18:00	0.00	0.00	0	0.00
2											0.88	9.54	10.82			2.10	21.25	7	148.72
3										9.39	9.50	10.19	12.34			4.00	41.43	7	289.98
4					10.56	10.62				10.22	9.89	9.12	9.01			6.00	59.42	7	415.93
5					5.69	5.55				5.01	5.01	5.19	5.72			6.00	32.17	7	225.21
6					13.33	12.21				9.44	9.92	12.00	15.63			6.00	72.52	7	507.67
																<b>Weekly Savings (MWh)</b>		<b>1587.51</b>	
																<b>MLL Typical Usage (MWh)</b>		<b>7937.25</b>	
																<b>Percentage Savings (%)</b>		<b>20.00%</b>	

Table 16: 25% Energy Savings during MLL Summer Period

Summer - Energy Savings (MWh)																			
Priority Group	Hour of the Day (7 = 07:00 - 07:59; 17 = 17:00 - 17:59)														Time Off per day (Hours)	Daily Savings (MWh)	Days Off per Week	Weekly Savings (MWh)	
	6	7	8	9	10	11	12	13	14	15	16	17	18	19					
1	No outages before 08:00														No outages after 18:00	0.00	0.00	0	0.00
2												3.57				0.45	3.57	7	25.01
3		9.44	9.52	9.33					8.74	8.67	8.45	9.23				7.00	63.38	7	443.65
4		13.00	13.15	13.18					12.79	12.60	11.88	11.66				7.00	88.25	7	617.76
5		6.38	6.38	6.40					6.16	6.18	6.22	6.27				7.00	43.99	7	307.95
6		10.70	10.12	9.57					8.57	8.81	9.60	11.11				7.00	68.48	7	479.35
<b>Weekly Savings (MWh)</b>																		<b>1873.71</b>	
<b>MLL Typical Usage (MWh)</b>																		<b>7495.15</b>	
<b>Percentage Savings (%)</b>																		<b>25.00%</b>	

Table 17: 25% Energy Savings during MLL Winter Period

Winter - Energy Savings (MWh)																			
Priority Group	Hour of the Day (7 = 07:00 - 07:59; 17 = 17:00 - 17:59)														Time Off per Day (Hours)	Daily Savings (MWh)	Days Off per Week	Weekly Savings (MWh)	
	6	7	8	9	10	11	12	13	14	15	16	17	18	19					
1	No outages before 08:00														No outages after 18:00	0.00	0.00	0	0.00
2											6.39	10.82				1.67	17.21	7	120.49
3		11.55	11.17	10.66					9.39	9.50	10.19	12.34				7.00	74.81	7	523.70
4		10.56	10.62	10.60					10.22	9.89	9.12	9.01				7.00	70.02	7	490.14
5		5.69	5.55	5.42					5.01	5.01	5.19	5.72				7.00	37.59	7	263.16
6		13.33	12.21	11.27					9.44	9.92	12.00	15.63				7.00	83.79	7	586.56
<b>Weekly Savings (MWh)</b>																		<b>1984.05</b>	
<b>MLL Typical Usage (MWh)</b>																		<b>7937.25</b>	
<b>Percentage Savings (%)</b>																		<b>25.00%</b>	

## 8.2 Target Monitoring

For load shedding to a weekly target, the Network Controller will monitor energy savings against target and, together with the GM Network Operations, review future load shedding to increase or decrease the amount of rolling outages to enable the weekly target to be met. A Network Engineer will be responsible for daily and weekly reporting of consumption relative to target levels to the System Operator, and also for providing the predicted load for the next week on a seven-day rolling basis. This prediction is to be by the Blenheim GXP for each half-hour.

## 8.3 Log of Rolling Outages

The Control Room Manager will log times of disconnection and reconnection of all feeder interruptions and enter them in the log sheet shown in Appendix A: Outage Log. These log sheets will be used to monitor the rolling outage program.

## 8.4 Contingent Events

If an unplanned event occurs that could alter the planned rolling outages, e.g. a Civil Defence emergency, a senior network engineer or network controller will be responsible for communication with retailers of any changes to the advertised program.

## 8.5 Customer Liaison

Consumers are advised to check the Marlborough Lines website for information about any rolling outages and which areas might be affected.

## 8.6 Vulnerable Consumers

Retailers maintain lists of consumers with medical or other issues. It is not feasible for MLL to prevent rolling outages affecting individual vulnerable consumers. During rolling outages general media releases will advise consumers with health problems as to their best course of action.



## Appendix B: Draft Rolling Outage Public Notice

### Electricity Supply Interruptions

Please read – your power supply may be affected.

Marlborough Lines is being required to reduce electricity consumption with rolling power outages across Marlborough to meet a .....% savings target set by the Electricity Authority 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. Turning off controlled hot water is a means of managing electricity consumption and this will be used extensively.

Outages will occur within the time periods noted in the schedule below. It is possible that changes in energy savings could occur **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 that telephones that rely on a mains supply may not operate during outages, so plan in advance.

Avoid using lifts and remember that EFTPOS and other electronic equipment may not be usable.

Areas in Marlborough	Monday	Tuesday	Wednesday	Thursday	Friday
XXX					
XXX					
XXX					
XXX					
XXX					
XXX					