



FC9014

Participant Rolling Outage Plan

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FC9014

Participant Rolling Outage Plan

Overview

Document status
Draft **In Service** Under Review Archived
Document purpose

This Participant Rolling Outage Plan (PROP) is written to comply with:

- Part 9 of the Electricity Industry Participation Code 2010 (the Code), and
- the System Operator Rolling Outage Plan (SOROP).

The procedures described 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.

Requirements under the Code

Under the Code, the PROP must specify the actions that will be taken to:

- reduce electricity consumption when requested by the System Operator
- comply with the requirements and supplement the SOROP, and
- comply with the Electricity Industry Participation Code 2010.

Supply of power

Reducing demand by disconnecting supply to customers is a last resort. This will only occur after all other forms of savings, including voluntary savings are exhausted. Unison Networks Limited (Unison) will always endeavour to maintain supply to its customers.

Intended audience

This document applies to all Unison staff responsible for the implementation of the PROP as outlined in *point 11.1*.

This document is also available to the public via Unison's website.

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Overview, Continued

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Renewal period – 2 years

Related references

Legislation

- Electricity Industry Act 2010
- Electricity Industry Participation Code 2010

Unison Emergency Plans

- FC9001 Crisis Management Plan
- FC9002 Crisis Communication Plan

Form

- Rolling Outage Log

Other Unison Documents

- Load Shed Feeder Model

Other References

- [System Operator Rolling Outage Plan](#) – available on the Transpower website
 - [Electricity Authority – Electricity Information Exchange Protocols EIEP5A: Planned service interruptions](#) – available on the Electricity Authority website
 - [Electricity Authority – Guideline on arrangements to assist medically dependent consumers](#) – available on the Electricity Authority website
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1. Definitions/Abbreviations

AUFLS	Automatic Under Frequency Load Shedding – an automated network operational control scheme required under the Code. AUFLS ensures the required level of load-shedding happens when the grid frequency drops below a pre-set value. This loss of load acts to stabilise the grid and recover the frequency.
Authority	For the purpose of this document refers to the Electrical Authority.
CDEM	Civil Defence Emergency Management – covers the four ‘Rs’ of reduction, readiness, response and recovery from a disaster.
Code	For the purpose of this document refers to the Electricity Industry Participation Code 2010.
Developing event	An event that evolves over time that could lead the System Operator to declare a supply shortage.
EIEP	Electricity Information Exchange Protocols – a set of standardised formats for business-to-business information exchanges which are: <ul style="list-style-type: none">• supported and coordinated by the Electricity Authority, and• informed by industry consultation and a panel of industry representatives.
Feeder	A section of the sub-transmission and distribution network.
GEN	Grid Emergency Notice
GXP	Grid Exit Point – any point of connection between Transpower’s transmission system and the distributor’s network.
Immediate event	An event that occurs with little or no warning, usually as a result of a transmission line or major generation failure. Such an event could lead the System Operator to declare a supply shortage.

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Definitions/Abbreviations, Continued

IR	<p>Instantaneous Reserve – generation capacity and interruptible load made available in the event of a sudden failure of a generating or transmission facility. It is made available to maintain system frequency at 50 Hz.</p> <p>Instantaneous reserve is procured based on the size of the single largest contingent event that could occur during a trading period. Generators offer instantaneous reserves at the same time as they make energy offers.</p>
Grid	<p>The network of high-voltage power lines between major power stations. The National Grid is part of the New Zealand electricity transmission system. It is operated by the Grid Operator, Transpower.</p>
NOC	<p>Network Operations Centre – Unison’s control room where the network is controlled in real-time 24 hours a day and seven days a week.</p>
PROP	<p>Participant Rolling Outage Plan – outlined in this document.</p>
Rolling outage	<p>Planned electricity disconnections spread over different parts of the network at differing times to avoid prolonged outages at any one location.</p>
Security	<p>A term used to describe the ability or capacity of a network to provide service after one or more equipment failures.</p>
SOROP	<p>System Operator Rolling Outage Plan</p>
Supply shortage declaration	<p>Declaration made by the System Operator after consultation with the Electricity Authority.</p>
System Operator	<p>Operator of the national electricity transmission grid (Transpower).</p>

2. Background

2.1 Electricity Authority The Electricity Authority (the Authority) is a Crown entity set up under the Electricity Industry Act 2010 to oversee New Zealand's electricity industry and markets.

In accordance with the Code the Authority must approve the System Operator Rolling Outage Plan (SOROP) submitted by the System Operator.

2.2 Transpower Transpower is a State-Owned Enterprise, that owns and operates New Zealand's National Grid.

As the System Operator, Transpower manages the real-time operation of New Zealand's power system and operates the wholesale electricity market. To keep the right amount of energy flow to match generated supply with demand, Transpower:

- forecasts supply and demand
 - develops and publishes guidelines of hydro levels for security of supply
 - enters into contracts for reserve energy, and
 - improves the ability for consumers to manage price risks in the market.
-

2.3 Unison Networks Limited Unison Networks Limited, trading as Unison, is the electricity lines company that safely delivers electricity to businesses and homes across three regions. These regions include Hawke's Bay, Taupo and Rotorua.

Unison also manages the Centralines' network covering the Central Hawke's Bay area. Centralines has a separate Participant Rolling Outage Plan (PROP) covering its network.

2.4 Supply and demand The System Operator controls the power system and operates the transmission network to match generation with customer demand. Constraints on the ability to manage this can arise from insufficient generation or transmission capacity. The result is a shortage of supply. As an example, shortage of supply can be caused by:

- low lake levels which reduces hydro generation
 - the failure of a large generator, or
 - a fault on a critical transmission circuit.
-

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Background, Continued

2.5 Supply shortage events

The SOROP outlines how the Authority will deal with security of supply situations based on the level of severity. Events which may lead the System Operator to make a supply shortage declaration can, in general terms, be categorised as follows:

- Developing event – an event that evolves over time, e.g. low hydro lake or fuel levels, or
 - Immediate event – an event that occurs with little or no warning. It is usually a result of a transmission line or major generation failure.
-

2.6 Major incident

During a security of supply emergency Unison will treat both a developing and an immediate event as a major incident. Unison's appointed staff member will activate the appropriate contingency plan to manage this type of incident.

Communication with electricity retailers, Civil Defence and other stakeholders will be managed following the procedures documented in:

- **FC9001 Crisis Management Plan**, and
- **FC9002 Crisis Communications Plan**.

Refer to *point 11.1* for details of Unison appointed staff and their responsibilities within this document.

3. Unison Networks Limited

3.1 The Network

Unison owns and operates network assets across the Hawke's Bay, Taupo and Rotorua regions. Each of these regions is a sub-network. These assets cover an area of 12,181km² and serve approximately 114,000 customers. Supply is received via seven Transpower Grid Exit Points (GXP) across the three regions. A map of Unison's supply area is shown in Figure 1.

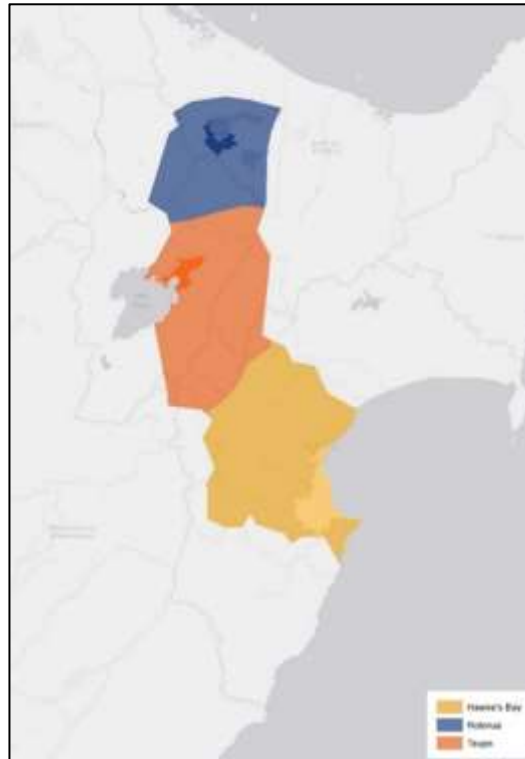


Figure 1 – Unison's Network Area

3.2 Means of reducing load

Unison can reduce load by disconnecting customers or directly turning off water heating. In addition, Unison may also reduce load through advertising, e.g. request customers to modify or reduce their electricity usage.

Water heating load shedding is generally not an option for sustained energy savings. It only defers, rather than reduces, energy demand. Additional load reductions would require disconnection of customers to achieve effective energy savings.

Automatic reduction can help to achieve this, either through:

- Automatic Under-Frequency Load Shedding (AUFLS)
- manual transfer to other grid supply points, or
- disconnecting load.

The actions required to deal with an immediate event and a developing event respectively, are detailed in *Section 4* and *Section 5*.

4. Actions for Immediate Events

4.1 Reserve generation

The System Operator must ensure enough reserve generation is available as 'spinning reserve'. This will cover the risk of the largest connected generator tripping. The System Operator must also keep the system frequency at 50Hz. If a large generator trips it may cause a reduction in frequency, which if not rectified, may result in other generators tripping. In turn, this could lead to cascade failure of the transmission system.

Reserve generation cannot immediately pick up the load of a disconnected generator. An immediate load reduction is required until an additional generator can pick up the load. AUFLS zones reduce load in stages until the frequency stabilises. These reductions are based on pre-determined levels of underfrequency prescribed in the Code.

To recover from an immediate event, electricity consumption can be reduced by the actions described in *points 4.2 and 4.3*.

4.2 Instantaneous Reserve (IR) market

Instantaneous Reserve (IR) markets operated by the System Operator to procure interruptible load which may be offered into by generators and load users. Interruptible load includes distribution networks control of hot water loads. The IR market capacity covers 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
- likely revenue stream from the market, less the compliance costs of participating in the reserve market.

Unison participates in this market currently via a third-party load aggregator. The third-party aggregator is responsible for market compliance.

Loads which are offered occasionally into the IR markets must be excluded from AUFLS Zone load allocation. These loads may be unavailable if IR have been dispatched.

4.3 Disconnect- ing customers

If the load shed by the IR market dispatch is insufficient to stabilise the network, further automatic load reduction is required.

It is a requirement of the Code that each distribution network company must always (unless exempted) have available two blocks of load. Each block must be 16% of its total load to be shed by automatic under frequency relays.

4.3.1 AUFLS Zone 1

In the Unison network, the AUFLS tripping relays are located at zone substations and Transpower substations, where individual feeders are tripped. Once tripped this will disconnect a minimum of 16% of Unison's network by disconnecting customers' supply.

Continued on next page

Actions for Immediate Events, Continued

4.3 Disconnect- ing customers (cont)

4.3.2 AUFLS Zone 2

If Zone 1 tripping fails to stabilise frequency, the next stage, Zone 2 activates. This will automatically disconnect a further 16% of Unison's network if the system frequency drops below 47.5Hz.

4.3.3 Manual Shedding

If AUFLS Zone 1 and Zone 2 tripping fails to stabilise frequency the System Operator will shed more load. This will be achieved by disconnecting:

- direct connect industrial customers, or
- distribution network GXP supplies.

Once the frequency has stabilised the System Operator will advise Unison's Network Operations Centre (NOC) when the load can be restored.

4.4 Declaration of an immediate event

During an immediate event the System Operator will provide as much prior notice as reasonably practicable to Unison. This will include the time and date the supply shortage declaration is likely to be made. However, it is likely a supply shortage declaration for an immediate event will need to be made without prior notice.

4.5 Rolling outages during immediate event

The System Operator may direct Unison to undertake rolling outages during an immediate event. This may occur, for example, if a grid emergency is likely to extend for a sustained period.

4.6 Communica- tions

It is expected that the System Operator will communicate with Unison's NOC, for urgent operational matters. Refer to *point 11.2* for all contact information.

4.7 Supply restoration

Restoration of disconnected load must be undertaken in coordination with the System Operator to prevent:

- overloading the transmission grid, and/or
- creating further instability.

Refer to *point 6.8* for load variation limits.

4.8 Transmission grid emergency notice

The System Operator may request Unison to reduce load under a Grid Emergency Notice (GEN). Refer to *point 8.1* for details of the response in the event of a GEN.

5. Actions for a Developing Event

5.1 Introduction

Rolling outages are a method of managing a developing event. Reduction in demand through disconnection of supply is considered only once all alternative methods of supply savings have been exhausted.

If the System Operator requests a load reduction for a developing event, Unison must reduce demand to meet the energy savings targets. The targets are likely to be in the form of a weekly energy savings target that is reviewed weekly. There may be financial penalties for not meeting the targets specified by the System Operator.

Unison will disconnect feeders or groups of feeders where they belong to a parallel or ring supply to reduce energy usage. This will be completed in a controlled manner to enable targets to be reached. These feeders are referred to as 'rolling outage feeders'.

5.2 Declaration of a developing event

The System Operator will endeavour to provide:

- at least 14 days' notice of a supply shortage declaration, and
- at least nine (9) days' notice of a direction containing a savings target. This notice will include the times and dates the savings target will likely apply.

If the System Operator declares a developing event, they will:

- determine the energy savings target to be enforced for a specific region for a specified timeframe, and
- manage general media advertising of the need to conserve electricity and the impending rolling outages when they are requested.

If Unison plans to issue a public message related to rolling outages, this will be sent to the Authority for review before being released. Any such communication will set a time for response by the Authority. This will enable the Authority's feedback to be included before Unison issues the message to the public.

6. Rolling Outage Strategy

6.1 Strategy overview

Unison has developed a strategy to determine the level of load shedding to achieve the target savings required by the Authority. This includes the development and maintenance of a Load Shed Feeder Model, that:

- lists and groups the AUFLS and rolling outage feeders, and
- calculates potential energy savings for any given feeder group shedding strategy.

Actual selection of feeders during any outage will most likely diverge from any pre-determined plan due to operational considerations. The rolling outage feeders determined in the Load Shed Feeder Model are not made publicly available. This is to avoid confusion regarding which feeders are to be disconnected.

6.2 Allocating feeders

Unison applies fundamental risk management principles to ensure the:

- health and safety of the public is preserved, and
- cost to the economy is minimised.

Table 1 below outlines the desired criteria for the selection of rolling outage feeders.

Priority	Priority Concern	Maintain Supply to...	Examples
1	Public health and safety	Hospitals, air traffic control centres and emergency operation centres	<ul style="list-style-type: none"> • Hastings Hospital • Rotorua Hospital • Taupo Hospital • Napier Airport • Rotorua Airport • Taupo Airport • Napier, Hastings, Taupo and Rotorua Police Stations • Unison Administration • Napier City Council Administration • Hastings DC Administration • Rotorua Lakes Council Administration • Taupo DC Administration • HB RC Administration • Civil Defence Emergency Operations Centres

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Rolling Outage Strategy, Continued

6.2 Allocating feeders (cont)

Priority	Priority Concern	Maintains Supply to...	Examples
2	Important public services	Communications networks, water, stormwater, flood protection and sewage pumping, and Port facilities	<ul style="list-style-type: none"> • Telephone exchanges • Major CBDs • Port of Napier • RLC Water Treatment Plant • HDC Sewerage Treatment Plant • Taupo Sewerage Treatment Plant
3	Public health and safety	Minor health/medical centres, schools and street lighting	<ul style="list-style-type: none"> • Medical centres • Schools • Colleges • Prisons • Hotels
4	Food production	Dairy and food production facilities	<ul style="list-style-type: none"> • Fonterra Reporoa • Heinz-Watties • Silver Fern Farms • McCain Foods
5	Maintaining production	Central business districts, commercial and industrial premises	<ul style="list-style-type: none"> • Retail • Timber processing • Manufacturing • Logistics depots
6	Avoiding disruption to households	Residential premises	

Table 1 – Priority of Supply

Continued on next page

Rolling Outage Strategy, Continued

6.3 Feeder group GXP

Unison has feeders grouped by area (according to Unison’s grid exit areas). These groups are outlined in Table 2. The priorities outlined in Table 1 are applied across each group and assigned a corresponding reference. For example, Group A5 refers to feeder Group A on the FHL GXP area with a priority of five (5).

Rolling outages will occur on every feeder.

Feeder Group	GXP	Rolling Outages May Occur
A	FHL	Y
B	WTU	Y
C	RDF	Y
D	WRK	Y
E	ROT	Y
F	TRK	Y
G	OWH	Y

Table 2 – Rolling Outage Feeder Groups

6.4 Feeder group – other services

Unison ensures the provision for other services, such as extended reserves (including AUFLS) and interruptible load.

Table 3 shows the percentage of average annual demand available in interruptible load or extended reserves by GXP.

GXP	AUFLS Block	% of Average Annual Demand Available for AUFLS	% of Average Annual Demand Available for Interruptible Load (MW)
ATI			Approximately 12MW
FHL	Z1, Z2	44	
WTU	Z1, Z2	24	
RDF	Z1, Z2	51	
WRK	Z1, Z2	52	
ROT11	Z1, Z2	43	
ROT33	Z1, Z2	32	
TRK	Z1	34	
OWH	Z1, Z2	100	

Table 3 – Extended Reserves and Interruptible Load on Rolling Outage Feeders

6.5 Potential savings calculation

The target savings specified by the System Operator allow for savings which may already be occurring as a result of other measures. As a starting point, groups will be selected depending on the saving level required. Tables 4 - 8 show how this is applied to achieve 5 - 25% energy savings target.

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Rolling Outage Strategy, Continued

6.5 Potential savings calculation (cont)

25% schedule																											
Group	Hours	Cuts per week	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Weekly savings (MWh)
6	14	7	5.5			4.7	4.8	5.3			9.1	8.7	8.4			7.5	7.3	7.5					9.8	8.8	7.7	6.4	709
5	14	7	37.7	36.6			36.7	38.9	44.8	53.0					59.9	59.2			54.3	51.7	50.2	48.7			42.1	39.2	4572
4	14	7	10.8	10.5	10.4	10.5							14.5	14.1			13.7	14.0			14.4	13.8	13.2	12.6	12.0	11.3	1230
3	12	7		16.0	15.2	15.0	15.5				29.0	28.2				23.1	22.5		24.3	28.3					22.3	19.1	1809
2	5	7	10.8	10.2	9.9																18.1	17.1					462
1	0	0																									0
																											8782
																									Average UNISON winter load		35628.20
																									Estimated Percentage Savings		25%

Table 4 – 25% Potential Energy Savings

20% Schedule																											
Group	Hours	Cuts per week	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Weekly savings (MWh)
6	13	7	5.5			4.7	4.8	5.3				8.7	8.4			7.5	7.3	7.5					9.8	8.8	7.7	6.4	645
5	13	7	37.7	36.6			36.7	38.9	44.8	53.0					59.9				54.3	51.7	50.2	48.7			42.1	39.2	4157
4	10	7		10.5	10.4								14.5	14.1			13.7	14.0			14.4	13.8			12.0	11.3	900
3	10	7		16.0	15.2	15.0	15.5				29.0	28.2				23.1	22.5								22.3	19.1	1440
2	0	7																									0
1	0	0																									0
																											7143
																									Average UNISON winter load		35628.20
																									Estimated Percentage Savings		20%

Table 5 – 20% Potential Energy Savings

15% Schedule																											
Group	Hours	Cuts per week	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Weekly savings (MWh)
6	13	7	5.5			4.7	4.8	5.3				8.7	8.4			7.5	7.3	7.5					9.8	8.8	7.7	6.4	645
5	11	7	37.7	36.6			36.7	38.9	44.8	53.0					59.9				54.3	51.7					42.1	39.2	3465
4	10	7		10.5	10.4								14.5	14.1			13.7	14.0			14.4	13.8			12.0	11.3	900
3	4	7		16.0	15.2	15.0	15.5																				431
2	0	7																									0
1	0	0																									0
																											5442
																									Average UNISON winter load		35628.20
																									Estimated Percentage Savings		15%

Table 6 – 15% Potential Energy Savings

10% Schedule																											
Group	Hours	Cuts per week	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Weekly savings (MWh)
6	6	7	5.5			4.7	4.8	5.3																	7.7	6.4	240
5	10	7	37.7	36.6			36.7	38.9	44.8	53.0										51.7	50.2				42.1	39.2	3017
4	4	7		10.5	10.4																				12.0	11.3	309
3	0	7																									0
2	0	7																									0
1	0	0																									0
																											3567
																									Average UNISON winter load		35628.20
																									Estimated Percentage Savings		10%

Table 7 – 10% Potential Energy Savings

Continued on next page

Rolling Outage Strategy, Continued

6.5 Potential savings calculation (cont)

			5% Schedule																								
Group	Hours	Cuts per week	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Weekly savings (MWh)
6	6	7	5.5			4.7	4.8	5.3																	7.7	6.4	240
5	5	7	37.7	36.6			36.7	38.9																		39.2	1324
4	3	7		10.5	10.4																				12.0		231
3	0	7																									0
2	0	7																									0
1	0	0																									0
																										1795	
																										Average UNISON winter load	35628.20
																										Estimated Percentage Savings	5%

Table 8 – Potential 5% Energy Savings

6.6 Existing agreements

Unison will not engage in agreements with retailers or consumers on its network which may adversely affect it from responding to a direction to reduce load. However, it does have a number of significant generators on the network which will be omitted from the Load Shedding Model.

6.7 Managing health and safety issues

No contractual agreement exists between Unison and its retailers to identify or manage health and safety associated with consumers affected by outages on its network. Consumer health and safety issues associated with electricity are addressed in the Guideline on arrangements to assist medically dependent consumers. In the Guideline the Electricity Authority outlines its expectations of electricity retailers in respect of medically dependent consumers. However, in accordance with its agreements with retailers for the provision of Distribution Services, Unison will support its retailers with a list of their affected customers supplied. Unison will do this using the mandatory file format prescribed by the Electricity Authority – Electricity Information Exchange Protocols EIEP5A: Planned service interruptions.

6.8 Load variation

Unison will endeavour to minimise the impact on:

- frequency and voltage stability, and
- the disconnection and restoration of its demand during times when demand is typically ramping up or down.

The level of AUFLS during rolling outages needs to be maintained. Unless agreed otherwise with the System Operator, the rate of load shedding will be no more than 25MW per 5 minutes. Unison will exclude the current AUFLS feeders from its Load Shed Feeder Model, so supply to lower value loads may be maintained while higher value loads are cut.

7. Implementing the Participant Rolling Outage Plan

7.1 Process overview

The PROP will commence once the System Operator provides notice that an increase in weekly energy savings target is required. In this section, the implementation of the PROP (shown in Figure 2) is described.

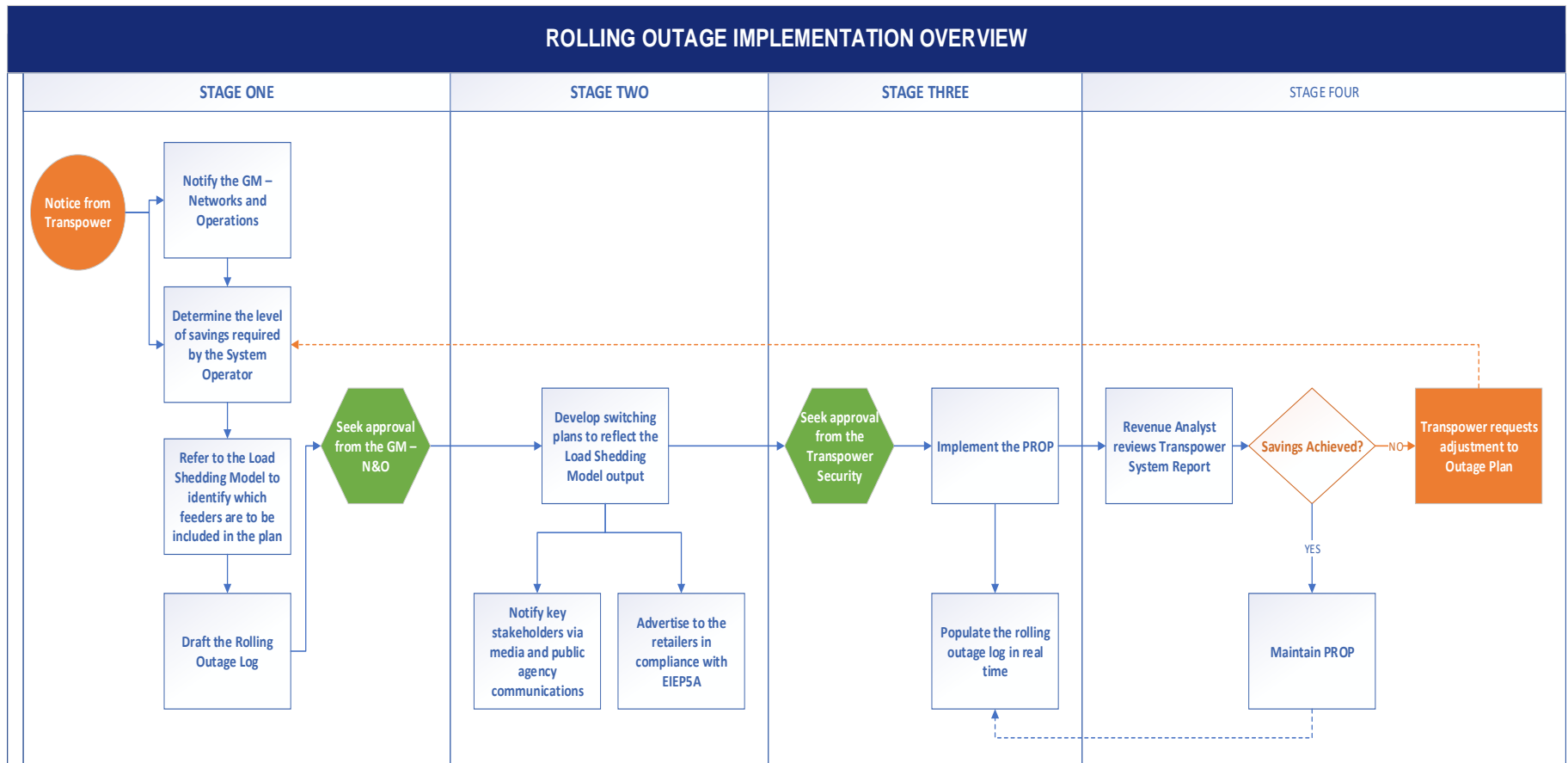


Figure 2 – Rolling Outage Implementation Overview

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Implementing the Participant Rolling Outage Plan, Continued

7.2 Stage One On receipt of the notice from the Transpower System Operator, the Operations Manager – Networks will:

- email the System Operator at system.operator@transpower.co.nz to acknowledge receipt of the notice
- notify the General Manager – Networks and Operations
- review the energy savings target
- use Unison’s Load Shed Feeder Model to determine the number of feeders to be included in rolling outages, and
- prepare the Rolling Outage Log supplied in *Appendix A – Rolling Outage Log*. This lists the selected feeders and proposed outage times.

The Operations Manager – Networks is responsible for advising and seeking approval from the General Manager – Networks and Operations of the proposed Rolling Outage Log before proceeding to Stage Two.

The General Manager – Networks and Operations is the **only** Unison authorised person able to implement the PROP.

7.3 Stage Two The Operations Manager – Networks will:

- ensure switching plans are developed as per the Load Shed Feeder Model
- notify the Unison System Control Operator, and
- ensure the retailers are notified of their affected customers as outlined in EIEP5A.

The Relationship Manager will notify the media and public agency communications in accordance with Unison’s policies and procedures. The media will be notified weekly of anticipated outages until the Rolling Outage Plan ends.

Note

Retailers are required to notify their vulnerable customers.

7.4 Stage Three

Before the Participant Rolling Outage Plan is implemented the Transpower System Operator Security Coordinator must give permission for the rolling outages to commence.

The Unison System Control Operator is responsible for updating the Rolling Outage Log. This includes disconnection and reconnection times. In addition, all actions will be recorded on the SCADA log.

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Implementing the Participant Rolling Outage Plan, Continued

7.5 Stage Four

The Revenue Analyst monitors the Transpower System Operator Report which outlines Unison's energy saving results against its target weekly savings. The Revenue Analyst will advise requirements for future load shedding needed to achieve the weekly target. Continued adjustments to the Load Shed Feeder Model will be made based on observed savings from the previous week.

Monitoring performance during the outage is detailed further in *point 9.2*.

7.6 Other planned outages

During the rolling outages Unison will consider postponing planned outages for maintenance and project work.

7.7 Contingent events

If an unplanned event occurs that will alter planned rolling outages, the Operations Manager – Networks will be responsible for making all decisions. Where possible, any changes to the planned timetable should be published on Unison's website and communicated to retailers.

8. Grid Emergency Coordination

8.1 Grid emergency

If the System Operator declares a grid emergency during a developing event, the grid emergency will take priority.

Water heating load is not used to reduce load in a developing event outside of winter demand peaks. However, Unison does have water heating load available for load reduction when required for a grid emergency. In the event of a grid emergency this load will be shed, and the System Operator advised. If more shedding is required, the System Operator can instruct the Grid Owner to disconnect load. After the grid emergency is cancelled the rolling outages pattern would continue.

8.2 Restoration of supply

Restoration of disconnected load must be a coordinated effort alongside the System Operator. This is to prevent overloading the transmission network and creating further instability. Refer to *point 6.8* regarding load variation.

9. Maintaining and Monitoring Performance

9.1 Assess performance

At the end of each week an assessment will be made of the adopted Load Shed Feeder Model to identify areas for improvement for the following week. This is detailed in Figure 2.

9.2 Performance monitoring

In parallel with the System Operator, the Revenue Analyst is responsible for daily and weekly reporting of consumption relative to target levels. This report uses the data provided daily by Transpower, as outlined in its SOROP, and Unison's data sources.

The Operations Manager – Networks is responsible for providing information to the System Operator on the actual performance against the savings target. This will include the nature and extent of the rolling outages.

Reporting of daily or real time limits to the System Operator will be too slow for taking real time action. In these cases, the Operations Manager – Networks, with the assistance of the Commercial Manager, will monitor Unison's savings. Adjustments will be made to the Load Shed Feeder Model when required.

These savings will be calculated using GXP loads measured by Unison's metering and SCADA system. These will be compared with the targets supplied by the System Operator.

10. Load Restoration

10.1 Coordination with the System Operator

Unison will endeavour to minimise the impact on frequency and voltage stability, and the disconnection and restoration of its demand during times when demand is typically ramping up or down.

Restoration of disconnected load must be coordinated with the System Operator. This is to prevent overloading the transmission grid and/or creating further instability. Unless agreed with the System Operator restoration will be at a rate of no more than 25MW per 5 minutes.

10.2 Revoke supply shortage declaration

Direction from the System Operator to revoke the supply shortage declaration is first directed to the NOC. This must be followed up with an email to control.room@unison.co.nz to ensure all Unison appointed responsible staff are notified.

Any load still disconnected must be restored in conjunction with the System Operator as detailed in *point 10.1*.

11. Communication

11.1 Roles and responsibilities

Table 9 describes the roles and responsibilities of Unison staff involved in the implementation and communication of the PROP.

Roles	Responsibilities
General Manager – Networks and Operations	<ul style="list-style-type: none"> • Managerial contact for the System Operator which includes all administrative matters and escalation. • Reports overall compliance to Electricity Authority. • Final authority to commence the PROP.
Operations Manager – Networks	<ul style="list-style-type: none"> • Operational contact for the System Operator. • Notifies the General Manager – Networks and Operations to implement PROP. • Prepares the load shedding schedules. • Reports to CDEM and Lifelines.
Commercial Manager	<ul style="list-style-type: none"> • General retailer communications.
Relationship Manager	<ul style="list-style-type: none"> • Reports to and addresses enquiries from the media and public agencies.
System Control Operator	<ul style="list-style-type: none"> • Notifies retailer of affected customers in accordance with EIEP5A.
Revenue Analyst	<ul style="list-style-type: none"> • Reports weekly savings to the Operations Manager – Networks.

Table 9 – PROP Roles and Responsibilities

11.2 Contact information

It is expected that the System Operators will communicate with the NOC, in most cases. Table 10 provides all necessary contact information.

Contact	NOC	All Other Staff
Email	control.room@unison.co.nz	outage.coordinator@unison.co.nz
Phone	0800 2 86476	0800 2 86476
Fax	06 873 9393	06 873 9311
Address	Physical: 1101 Omahu Road Hastings 4175 Postal: PO Box 555 Hastings 4156	

Table 10 – Contact Information

Continued on next page

Communication, Continued

11.3 Shutdown notification

With the wide-scale impact of the rolling outages it is not feasible to use Unison's standard planned outage notification process. This is mainly because retail and postal systems could not process the thousands of outage notifications required.

When implementing the PROP, Unison will notify outages as follows:


- Public notices – Unison will place public notice advertisements in local newspapers (refer to *Appendix B – Draft Rolling Outage Public Notice*). This will provide a rolling outage timetable showing the times and areas affected by rolling outage
- Unison website – www.unison.co.nz under the Power Outages option showing the rolling outage timetable, and
- Retailer notification – Unison will provide the rolling outage timetable to all electricity retailers. The timetable will include a schedule showing the rolling outage group for all ICPs. (It is not appropriate to filter the schedule for an individual retailer's ICPs, as this would place switching ICPs at risk.)

Where possible, Unison will provide seven (7) days' notice of all rolling outage plans, generally publishing and issuing notifications on a Monday to apply from the following Monday.

11.4 Vulnerable customers and priority sites

It is not possible for Unison to prevent the rolling outages affecting individual vulnerable customers and priority sites. In addition to the prioritisation of rolling outage feeders, Unison will provide information in its public notices and website alerting customers, including vulnerable customers to the risks.

Appendix A – Rolling Outage Log

<h2 style="margin: 0;">Rolling Outage Log</h2>					
Day _____		Date _____			
Total MW _____		Off _____	On _____		
Area/Location	Substation	Circuit Breaker or Device	Time Opened	Time Closed	Device Loading (AMPs)

Form Issued under FC9014 Participant Rolling Outage Plan
Uncontrolled When Printed
Page 1 of 1
Classification – In Confidence

Appendix B – Draft Rolling Outage Public Notice

Electricity Supply Interruptions

Please read - Your supply may be affected

Unison is being required to reduce electricity consumption with rolling power outages across Hawke’s Bay, Taupo and Rotorua regions to meet an 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 healthcare provider for assistance. Please note that telephones that rely on a mains supply may not operate during outages, so plan in advance.

Areas	Priority Group	Monday	Tuesday	Wednesday	Thursday	Friday
A	1	8pm-12am	8pm-12am	1pm-5pm	1pm-5pm	
B	2	8pm-12am		1pm-5pm		
C	1		8pm-12am			1pm-5pm
D	2		8pm-12am		1pm-5pm	
E	1		8pm-12am		1pm-5pm	

Connections in priority groups other than those listed (and those with a ‘reserved’ priority) are not scheduled for rolling outages in this period.

Appendix C – Summary of Document Changes

Date	Version No.	Changes to Document	Creator	Authoriser	Approver
15/03/2010	1.0	New Plan	Operations Manager	GM Networks & Operations	CEO
28/04/2010	1.1	Addition of: <ul style="list-style-type: none"> • 25% Schedule in section 19.7, and • Appendix C. 	Operations Manager	GM Networks & Operations	CEO
14/08/2015	2.0	<p>Full review and update into new template.</p> <p>Document renamed from Security of Supply Participant Outage Plan to Participant Rolling Outage Plan.</p> <p>Updated to Definitions – Authority, Code, Supply shortage Declaration, Electricity Authority and Transpower.</p> <p>Addition of:</p> <ul style="list-style-type: none"> • point 3.1 Supply and demand, and • point 4.2 Authority to commence rolling outages. <p>Minor updates to points 2.1, 2.2, 3.1, 3.2, 4.1, 6.1, 6.2, 6.3, 6.4, 6.5, 7.1, 8.1, 8.2, 8.3, and 9.3.</p> <p>Deletion of point 12.7 Planned savings.</p> <p>Reference to Commission replaced with either System Operator or the Authority.</p> <p>Appendix C – Feeder Priorities deleted.</p>	Operations Manager – Networks	Operations Manager – Networks	GM Networks & Operations

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Appendix C – Summary of Document Changes, Continued

Date	Version No.	Changes to Document	Owner	Authoriser	Approver
25/06/2020	3.0	<p>Full review to comply with revised SOROP and restructure of document.</p> <p>Minor updates to points 5.2, 6.1 and 6.2.</p> <p>Addition of points:</p> <ul style="list-style-type: none"> • 6.1 – Strategy overview • 11.1 – Roles and responsibilities, and • 11.2 – Contact information. <p>New Section 7 – Implementing Participating Rolling Outage Plan.</p>	Operations Manager – Networks	Operations Manager – Networks	GM Networks and Operations
16/12/2020	3.1	<p>Minor review based on recommendations from Transpower.</p> <p>EIEP definition added.</p> <p>Addition of points:</p> <ul style="list-style-type: none"> • 4.5 Rolling outages during immediate event • 6.4 Feeder group – other services • 6.6 Existing agreements, and • 6.7 Managing health and safety issues <p>Minor updates to points 5.2, 6.2, 6.3, 6.5, 6.8, 7.1 - 7.5, 10.1, 11.1, 11.2, and Appendix B.</p>	Operations Manager – Networks	Operations Manager – Networks	GM Networks and Operations
04/02/2021	3.2	<p>As requested by Transpower, minor update to point 6.5 – target savings specified by the Authority changed to 'by the System Operator'.</p>	Operations Manager – Networks	Operations Manager – Networks	GM Networks and Operations