

# *Security of Supply Participant Outage Plan*



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**TOP ENERGY®**  
Te Puna Hihiko

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## 1. Introduction

This plan was written to comply with the Electricity Commission's Security of Supply Outage Plan (SOSOP).

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 Electricity Commission 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, participant outage plans (POP) are required to specify the actions that would be taken to;

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

Reducing demand by disconnecting supply to customers would be a last resort after all other forms of savings including voluntary savings had been exhausted. Top Energy will always endeavour to keep supply on to customers.

### 3. Definitions

AUFLS	Automatic Under Frequency Load Shedding
The Commission	Electricity Commission
Feeder	A high voltage supply line typically supplying between 100 and 2000 customers
GXP	Transpower Grid Exit Point
GEN	Grid Emergency Notice
POP	Participant Outage Plan (this plan)
The Regulations	Electricity Governance (Security of Supply) Regulations 2008 and Electricity Governance (Security of Supply) Amendment Regulations 2009
Rolling Outages	Planned electricity disconnections spread over different parts of the network at differing times to avoid prolonged outages at any one location
Security Coordinator	The person responsible for system security at the System Operator
SOSOP	Security of Supply Outage Plan
Supply Shortage Declaration	Declaration made by the Electricity Commission under Regulation 9
System Operator	Operator of the national electricity transmission grid



## 4. Background

### 4.1 Electricity Commission

The Electricity Commission is a Crown entity set up under the Electricity Act to oversee New Zealand's electricity industry and markets.

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

### 4.2 Transpower

Transpower is a State Owned Enterprise, tasked with owning and operating New Zealand's National Grid - the network of high voltage transmission lines and substations that transports bulk electricity from where it is generated to distribution line companies such as Top Energy.

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.

### 4.3 Top Energy

Top Energy is the electricity network company that owns and maintains the electricity lines and cables that deliver power to the Far North region.

## 5. Range Of Events

### 5.1 Range Of Events

Events that could lead the Commission to make a supply shortage declaration can in general terms be categorized as;

- **Developing Events** – Events that evolve over time, for example low hydro lake or fuel levels.
- **Immediate Events** – Events that occur with little or no warning, usually as a result of a transmission line or major generation failure.

### 5.2 Major Incident

A Developing Event or Immediate Event will be classed by Top Energy as a major incident and Top Energy's management team will activate the appropriate contingency plan and will manage the incident accordingly.

Communication with retailers, civil defence and other stakeholders will be as per the notification procedures described in the Top Energy Emergency Management Plan.

## 6. Top Energy Staff Responsibilities

ROLE	PERSONNEL
Receive communication from Commission	CEO or General Manager Networks
Receive communication from System Operator	Top Energy Control Centre
Implement this plan	Network Operations Manager
Preparation of load shedding schedules	Control Centre Manager
Customer notification	Operations Administrator
Weekly savings reporting	Network Operations Manager
Revoking rolling outages	Network Operations Manager
Reporting to Electricity Commission	General Manager Networks
Reporting to media, public agencies	CEO or General Manager Networks
Reporting to CDEM and Lifelines	Network Operations Manager

## 7. Communication with the Commission

The Commission can contact Top Energy using the following details:

Normal Work hours	Outside Work Hours
Top Energy Ltd	Top Energy Ltd
FAX +64 9 407 0611	PH +64 9 401 5440
PH +64 9 401 5440	
P.O. Box 43,	
Kerikeri 0243	

Top Energy will contact the Commission's Emergency Response Project Manager for administration purposes (including reporting performance against targets) using the following details:

### Electricity Commission

FAX: 04 460 8879

PH: 04 460 8860

PO Box 10041

Level 7, ASB Bank Building, 2 Hunter Street

WELLINGTON

## 8. Actions for Immediate Events

### 8.1 Frequency Events

Transpower, as the System Operator, is required to keep enough reserve generation to cover the risk of the largest connected generator tripping. They are also required to keep the system frequency 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 cascade failure of the transmission system.

As reserve generation cannot immediately pick up the load of a disconnected generator, an immediate load reduction is required until additional generation can pick up load.

To recover from under frequency type Immediate Events, electricity consumption can be reduced by:

#### 8.1.1 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 loads targeted by this process are normally considered discretionary by the customer and will not normally result in a total loss of supply.

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.

Top Energy does not presently participate in this market.

#### 8.1.2 Disconnecting Customers

##### 8.1.2.1. Automatic Under Frequency Load Shedding (AUFLS)

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

Each distribution network company must, unless exempted, have available at all times two blocks of load, each 16% of its total load, to be shed by automatic under frequency relays.

##### 8.1.2.1.1. AUFLS Zone 1

If system frequency fails to recover after Reserve Market load shed, AUFLS Zone 1 shedding will occur by disconnecting customers supply. In the Top Energy Network the tripping relays are owned by Transpower and in some cases whole zone substations are tripped. AUFLS Zone 1 feeders are:

Breaker #	Feeder Name	Customer #	Peak Load
CB0105	Rangiahua	761	2.04%
CB0109	Taheke	432	0.97%
CB0111	Horeke	668	1.23%
CB0206	Towai	455	1.22%

CB0208	Opua	692	1.65%
CB0405	Totara Nth *	1072	2.77%
CB0406	Riverview	1999	6.07%
CB0408	Purerua	1271	3.32%
CB0504	Rawene *	537	1.12%
CB0506	Opononi	990	1.69%
CB1105	South rd	827	1.69%
CB1106	Kaitaia West	124	0.44%
CB1109	Herekino	998	2.31%
CB1406	Awanui	849	2.35%

Note: It is currently being discussed between Top Energy and Transpower to remove Totara North and Rawene feeders from the AUFLS shedding list. This is due to the presence of two emergency community hospitals at these locations.

#### 8.1.2.1.2. AUFLS Zone 2

If zone 1 tripping fails to restore frequency, the next stage, zone 2 activates. This will disconnect a further 16% of Top Energy's Network. AUFLS Zone 2 feeders are:

Breaker #	Feeder Name	Customer #	Peak Load
CB0110	Ohaewai	706	1.86%
CB0305	Tau block	95	0.27%
CB0307	Pokapu	264	0.76%
CB0308	Moerewa	498	1.12%
CB0607	Puketona	973	3.49%
CB0608	Onewhero	71	0.71%
CB1206	Oruru	1010	1.81%
CB1207	Tokerau	1222	1.94%
CB1208	Mangonui	1359	2.71%
CB1305	Te Kao	575	1.02%
CB1306	Pukenui South	537	1.06%



### 8.1.2.2. Manual Shedding

If AUFLS Zone 1 and Zone 2 tripping fails to stabilize frequency the System Operator will shed more load. Remaining Emergency load shedding feeders available to the system operator are:

Breaker #	Feeder Name	Customer #	Peak Load
CB0407	Whangaroa	1109	2.71%
CB0210	Russell	1515	3.45%
CB0108	Awarua	958	2.77%
CB0606	Tii Bay	814	2.54%
CB0609	Joyces Rd	878	2.67%
CB0409	Aerodrome Rd	1204	5.27%
CB1108	Oxford St	1067	2.68%
CB1110	Pukepoto	985	2.84%
CB0107	Kaikohe	1185	3.29%
CB0207	Kawakawa	393	1.22%
CB1107	Redan Rd	690	2.71%
CB1408	North Rd	525	1.35%
CB0304	AFFCo	1	2.40%
CB0410	China Clay	279	2.01%
CB1407	Triboard1	0.25	8.56%
CB1409	Triboard2	0.25	3.29%
CB1410	North Mill1	0.25	1.20%
CB1405	North Mill2	0.25	2.71%
CB0106	NRCF	1	0.69%

## 8.2 Transmission Grid Emergency

In the event of a major transmission grid outage the ability of the Grid to deliver adequate power may require reductions to the load at some or all Grid exit points. The System Operator may request Top Energy to reduce load under a grid emergency notice (GEN). Top Energy will as a first step shed all water heating load, the System Operator will be advised. Top Energy currently has the capability to shed a maximum of 10% of concurrent water heating load dependant on the time of operation. If more shedding is required the System Operator will instruct Top Energy to disconnect load as per the emergency load shedding protocol. This will be carried out by feeder priority as detailed in section 11 of this document.

The reduction in load required to meet a Grid emergency would be used to offset any load reduction required by the Grid operator or Electricity Commission to meet a concurrent frequency or energy initiated event.

### 8.3 Supply Restoration

After any Immediate event the restoration of disconnected load must be restored in conjunction with the System Operator. This is to prevent overloading the transmission grid and/or creating further instability.

The following example illustrates this strategy in progress:

System Operator Request	Top Energy Action	Overall Load Reduction
Grid Emergency - Load Reduction 5%	Liaise with Ngawha Geothermal Station to request maximum generation output.  Enact Hot Water load control, Clear ripple channels equivalent to 5% load reduction comparative to current maximum demand level.	<b>5%</b>
Grid Emergency increases - Load Reduction 10%	Enact Further Hot Water load control, Clear remaining ripple channels, and  Begin load shed of feeders in priority order as detailed in Section 8 of this report to a maximum of 10% load reduction comparative to current maximum demand level.	<b>10%</b>
Grid Emergency increases - Load Reduction 20%	Continue with load shedding of feeders in priority order as detailed in Section 8 of this report to a maximum of 20% load reduction comparative to current maximum demand level.	<b>20%</b>
Grid Emergency revoked	Restoration of customer supplies as directed by the system operator.  Restoration of Hot Water systems.  Inform Ngawha Geothermal Station of end of Grid Emergency	<b>nil</b>

## 9. Developing Events

Developing Events are most likely to arise due to the predicted lack of stored energy available to meet national demand. This energy shortage will typically develop over time as consumption exceeds inflow. The commission is charged with ensuring that if such a situation develops energy savings are made to mitigate the impact on the economy.

If, during such a event, the Commission requests through the System Operator a load reduction for a Developing Event, Top Energy must reduce supply to meet the Commission's targets. The targets are likely to be in the form of a weekly energy savings target that is reviewed each week. To reduce energy usage Top Energy would disconnect feeders or groups of feeders (rolling outage feeders) in a controlled manner to enable targets to be reached.

There may be financial penalties for not meeting the targets specified by the Commission.

Water heating load shedding has limited application for energy savings as the energy consumption is often delayed rather than reduced.

## 10. Declaration of Supply Shortages

If the Commission declares a supply shortage and directs rolling outages, all sections within this plan dealing with the implementation of rolling outages (Sections 10-19 inclusive) apply to both Immediate Events as well as Developing Events.

In declaring a supply shortage situation, the Commission will endeavour to provide 9 days prior notice of the requirement for weekly energy savings and any increase in the weekly energy savings target.

To declare a supply shortage event the Commission would make a request through the System Operator who will specify the energy savings target to be enforced for a specific region and time frame.

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

If Top Energy wishes to issue a public message related to the requested rolling outages then the message will be sent to the Commission for review before being released. Any such communication will give a time for response from the Commission, so as their feedback can be included before Top Energy issues the message to the public.

## 11. Criteria for Rolling Outages

To ensure public health and safety is preserved and costs to economy are minimised the following table shows a desired criteria for selecting rolling outage feeders to be included in rolling outages.

**11.1 Table 1. Priority Loads**

Priority	Priority Concern	Maintain Supply to	Examples
1	Public health and safety	Major hospitals, and emergency operation centres	Kawakawa and Kaitaia hospitals Energy main building
2	Important public services and economic activities. (These will be targeted for voluntary savings)	Major industries, Prison Major emergency services	Affco, Juken Nissho, Top Energy Control centre
3	District economic and social well being	Major commercial and public service centres Secondary School supplies	Kaitaia, Kerikeri, Kaikohe, Paihia and Russell
4	Disruption to customers	General feeders	All remaining feeders

Rolling outage feeders will all contain a variety of customers. The priority for each rolling outage feeder will be based on the priority ratings assessed for the connections within each feeder, according to the following:

Priority 1	Any feeder that has one or more priority 1 connections
Priority 2	Any feeder that has one or more priority 2 connections
Priority 3	All feeders that affect more than 30% of a nominated significant commercial area
Priority 4	Remaining feeders

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. Due to the network configuration Top Energy has previously been able to treat both its grid exit points as one for the assignment of AUFLS feeders and this will continue.

With that in mind, rolling outage feeders with the same priority and in either GXP area are grouped together into rolling outage groups. This level of grouping simplifies the planning, management and notification of rolling outages and allows for more accurate control of load on what is a relatively small network. Rolling outage feeder priority groupings are listed in the table overleaf:

Breaker #	Zone S/S	Feeder Name	Priority Group	Priority Concern
CB0207	Kawakawa	Kawakawa	1	Public health and safety  Major hospitals, and emergency operation centres
CB0405	Waipapa	Totara Nth		
CB0504	Omanaia	Rawene		
CB1107	Okahu Rd	Redan Rd		

Breaker #	Zone S/S	Feeder Name	Priority Group	Priority Concern
CB0106	Kaikohe	NRCF	2	Important public services and economic activities. (These will be targeted for voluntary savings)  Major industries, Prison  Major emergency services
CB0304	Moerewa	AFFCo		
CB0409	Waipapa	Aerodrome Rd		
<i>Future</i>	<i>Mt Pokaka</i>	<i>Mt Pokaka</i>		
CB1405	NPL	North Mill2		
CB1406	NPL	Awanui		
CB1407	NPL	Triboard1		
CB1409	NPL	Triboard2		

CB1410		North Mill1		
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Breaker #	Zone S/S	Feeder Name	Priority Group	Priority Concern
CB0107	Kaikohe	Kaikohe	3	District economic and social well being  Major commercial and public service centres Secondary School supplies
CB0108	Kaikohe	Awarua		
CB0111	Kaikohe	Horeke		
CB0406	Waipapa	Riverview		
CB0407	Waipapa	Whangaroa		
CB0506	Omanaia	Opononi		
CB0606	Haruru	Tii Bay		
CB0609	Haruru	Joyces Rd		
CB1105	Okahu Rd	South rd		
CB1108	Okahu Rd	Oxford St		
CB1207	Taipa	Tokerau		
CB1305	Pukenui	Te Kao		
CB1306	Pukenui	Pukenui South		
<i>Future</i>	<i>Kerikeri</i>	<i>Kerikeri</i>		

Breaker #	Zone S/S	Feeder Name	Priority Group	Priority Concern
CB0105	Kaikohe	Rangiahua	4	Disruption to Customers  General Feeders
CB0109	Kaikohe	Taheke		
CB0110	Kaikohe	Ohaewai		
CB0206	Kawakawa	Towai		
CB0208	Kawakawa	Opua		
CB0210	Kawakawa	Russell		
CB0305	Moerewa	Tau block		
CB0307	Moerewa	Pokapu		
CB0308	Moerewa	Moerewa		

CB0408	Waipapa	Purerua		
CB0410	Waipapa	China Clay		
CB0607	Haruru	Puketona		
CB0608	Haruru	Onewhero		
CB1106	Okahu Rd	Kaitaia West		
CB1109	Okahu Rd	Herekino		
CB1110	Okahu Rd	Pukepoto		
CB1206	Taipa	Oruru		
CB1208	Taipa	Mangonui		
CB1408	NPL	North Rd		

### 11.2 Vulnerable Customers and Priority Sites

It is not possible for to prevent rolling outages affecting individual vulnerable customers and priority sites. In addition to the prioritisation of rolling outage feeders, Top Energy will:

- Provide information in its public notices and website alerting vulnerable customers to the risks, and
- Request that retailers consider individually notifying their vulnerable customers.

## 12. AUFLS Under Rolling Outages

The level of AUFLS during rolling outages needs to be maintained. Top Energy will either:

- Include AUFLS feeder shedding but limit the shedding to ensure that two AUFLS blocks of at least 16% of remaining load are maintained. That is, if we shed 20% of our network load we would also shed up to 20% of the AUFLS load or, if time permits,
- Arm additional higher value load feeders to supplement the AUFLS load, and exclude these from its rolling outage plan.

## 13. Shutdown Notification

With the wide scale impact of rolling outages it is not feasible to use our standard planned outage notification process. When implementing a rolling outage plan, Top Energy will notify the outages in a number of ways:

- Public notices – Top Energy will place public notice advertisements (see draft in Appendix B) providing a rolling outage timetable showing the times and areas affected by rolling outages. The advertisement will provide details of our website page and contact details for customers that wish to seek more information.



- Top Energy website - a dedicated website page will be set up which shows the rolling outage timetable, and allows customers to identify which rolling outage group they belong to.
- Retailer notification – Top Energy will provide the rolling outage timetable to all electricity retailers together with 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 places switching ICPs at risk).

Where possible, Top Energy will 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 the System Operator

All communications with the System Operator will be between Top Energy's Control Centre and Transpower's Regional Operating Centre using Transpower's TSX telephone or normal communication systems.

Prior to notifying and implementing a rolling outage plan, Top Energy 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 agreed with the System Operator, load shedding and restoration shall be no more than 5MW per 5 minutes to mitigate voltage fluctuations on the network.

## 15. Grid Emergency during Developing or Immediate Events

If the system operator declares a grid emergency during either a Developing Event or Immediate Event, the grid emergency will take priority. As water heating load generally would not be used to reduce load in a Developing Event, Top Energy would have water heating load available for load reduction when required for the grid emergency. This load would be shed, the System Operator advised and if more shedding is required the System Operator will instruct Top Energy to disconnect load as per the list of emergency load shedding feeders in Section 8 of this document.

After the grid emergency is cancelled the rolling outages pattern would continue at a reduced level reflecting any extra energy savings made during the Grid Emergency.

## 16. Rolling Outages Strategy and Methodology

The Operations Manager and Control Centre Manager will review weekly targets and prepare plans for weekly rolling outages based on savings required.

The methodology is:

- Each distribution feeder exiting a zone substation (or switching station, or group of feeders where they belong to a parallel or ring supply) will be named as a "Rolling outage feeder".
- Rolling outage feeders will be assigned a priority according to the criteria specified in section 11. Feeders that belong to AUFULS block 1 and 2, or alternative AUFULS feeders

where implemented, will be excluded from rolling outage groups unless sufficient load has been shed to maintain the 16% requirement.

- A set of switching instructions will be prepared for each rolling outage group.
- 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 outage plan. As far as possible, groups should be selected depending on the saving level required, as follows:

Savings required	Priority groups used
0 to 5%	4
10%-15%	3,4
Greater than 15%	2,3,4

Further, as far as sensible, the total outage durations should be determined to meet the following relationship:

Group Priority	Relative duration
4	5 to 8
3	5 to 8
2	8 above 15% savings
1	0

To the extent possible, outages should be programmed to be held during daylight hours, between 8am and 6pm, but extending into the evening where necessary to achieve the required savings level or accommodate switching logistics.

Unless advised otherwise by the System Operator, the rolling outages plan must provide sufficient time for switching of load to ensure that Top Energy's load does not increase or decrease by more than 5MW in any 5 minute period. The Controllers carrying out switching are to monitor their activities in relation to this limit.

Having established the week ahead rolling outage plan and despite significant uncertainty in predicting customer and embedded generator behaviour during these types of events, Top Energy will use best endeavours to produce a rolling week ahead half hourly load for each GXP and the total network. This will be updated daily to reflect any adjustments to our plan and forwarded electronically to the Security Co-ordinator (at the System Operator) in spreadsheet format containing the following data and a separate sheet per day.

Date	Trading period	Top Energy Southern Load	Est. Southern Embedded Generation (Ngawha)	Kaikohe GXP Load	Kaitaia GXP Load	Total Network Mwh	Target MWh	Predicted Variance
	1	MW Load	MW Load	MW Load	MW Load	MW Load		
	2	MW Load	MW Load	MW Load	MW Load	MW Load		
	etc	etc	etc	etc	etc	etc		
		etc	etc	etc	etc	etc		
	48	MW Load	MW Load	MW Load	MW Load	MW Load		

If Top Energy is unable for some reason to meet the load disconnection/restoration ramp rates, or if there is expected to be a material departure (greater than 20%) from the previously provided half hourly Network load forecast / load profile, then Top Energy would communicate directly with the System Operator (ie the Security Coordinator) to ensure that real time security issues can be managed.

Using the methodology including current AUFLS feeders indicative plans for savings are:

5% Saving schedule						
AUFLS feeders affected						
Priority Ranking	Cuts per week	Cut durations	Total Hours	Energy Savings kWh	Weekly Savings %	
4	5	5	25	783	5.13%	
3	0	0	0	0	0.00%	
2	0	0	0	0	0.00%	
1	0	0	0	0	0.00%	
Estimated savings						5.13%

10% Saving schedule						
AUFLS feeders affected						
Priority Ranking	Cuts per week	Cut durations	Total Hours	Energy Savings kWh	Weekly Savings %	
4	5	5	25	783	5.13%	
3	5	5	25	748	4.90%	
2	0	0	0	0	0.00%	
1	0	0	0	0	0.00%	
Estimated savings						10.04%

## 15% Saving schedule

AUFLS feeders affected

Priority Ranking	Cuts per week	Cut durations	Total Hours	Energy Savings kWh	Weekly Savings %
4	5	8	40	1252.8	8.21%
3	5	7	35	1047.2	6.86%
2	0	0	0	0	0.00%
1	0	0	0	0	0.00%
Estimated savings					15.08%

## 20% Saving schedule

AUFLS feeders affected

Priority Ranking	Cuts per week	Cut durations	Total Hours	Energy Savings kWh	Weekly Savings %
4	6	8	48	1503.36	9.86%
3	5	8	40	1196.8	7.85%
2	2	8	16	351.68	2.31%
1	0	0	0	0	0.00%
Estimated savings					20.01%

## 25% Saving schedule

AUFLS feeders affected

Priority Ranking	Cuts per week	Cut durations	Total Hours	Energy Savings kWh	Weekly Savings %
4	6	8	48	1503.36	9.86%
3	6	8	48	1436.16	9.41%
2	5	8	40	879.2	5.76%
1	0	0	0	0	0.00%
Estimated savings					25.03%

The following example illustrates this strategy in progress:

System Operator Request	Top Energy Action	Overall Load Reduction
AUFLS Rolling Outages - Load Reduction required 5% for 1 week	<p>In consultation with System operator, identify outage times and requirements.</p> <p>Notify customers of intention to enact rolling outages 1 week in advance of outage dates.</p> <p>On the outage days, load shed feeders relative to the priority 4 group for 5 hours per day for 5 days (normally Monday to Friday).</p> <p>At the end of each outage, restore system to normal.</p>	<b>5% system load reduction across the week</b>
AUFLS Rolling Outages - Load Reduction required 10% for 1 week	<p>In consultation with System operator, identify outage times and requirements.</p> <p>Notify customers of intention to enact rolling outages 1 week in advance of outage dates.</p> <p>On the outage days, load shed feeders relative to the priority 4 group followed by the priority 3 group for 5 hours per day for 5 days (normally Monday to Friday).</p> <p>At the end of each outage, restore system to normal.</p>	<b>10% system load reduction across the week</b>
AUFLS Rolling Outages - Load Reduction required 15% for 1 week	<p>In consultation with System operator, identify outage times and requirements.</p> <p>Notify customers of intention to enact rolling outages 1 week in advance of outage dates.</p> <p>On the outage days, load shed feeders relative to:</p> <ul style="list-style-type: none"> <li>• Priority 4 group for 8 hours per day for 5 days (normally Monday to Friday), followed by</li> <li>• Priority 3 group for 7 hours for 5 days (normally Monday to Friday).</li> </ul> <p>At the end of each outage, restore system to normal.</p>	<b>15% system load reduction across the week</b>
AUFLS Rolling Outages - Load Reduction required 20% for 1 week	<p>In consultation with System operator, identify outage times and requirements.</p> <p>Notify customers of intention to enact rolling outages 1 week in advance of outage dates.</p> <p>On the outage days, load shed feeders relative to: P</p> <ul style="list-style-type: none"> <li>• Priority 4 group for 8 hours per day for 6 days (normally Monday to Saturday), followed by</li> <li>• Priority 3 group for 8 hours for 5 days (normally Monday to Friday), followed by</li> <li>• Priority 2 group for 8 hours for 2 days (normally Monday and Tuesday)</li> </ul> <p>At the end of each outage, restore system to normal.</p>	<b>20% system load reduction across the week</b>

AUFLS Rolling Outages - Load Reduction required 25% for 1 week	<p>In consultation with System operator, identify outage times and requirements.</p> <p>Notify customers of intention to enact rolling outages 1 week in advance of outage dates.</p> <p>On the outage days, load shed feeders relative to: P</p> <ul style="list-style-type: none"> <li>• Priority 4 group for 8 hours per day for 6 days (normally Monday to Saturday), followed by</li> <li>• Priority 3 group for 8 hours for 6 days (normally Monday to Saturday), followed by</li> <li>• Priority 2 group for 8 hours for 5 days (normally Monday to Friday)</li> </ul> <p>At the end of each outage, restore system to normal.</p>	<b>25% system load reduction across the week</b>

## 17. Target Monitoring

To avoid discrepancy over the accuracy of different data sources, the Electricity Commission (in conjunction with the System Operator) will report on actual demand versus the target.

For load shedding to a weekly target, the Network Business Analyst will monitor the Electricity Commission report of our savings results to our target and together with the General Manager Networks or Network Operations Manager, review future load shedding to increase or decrease amount of rolling outages to enable the weekly target to be met. In parallel (as a check) with the Electricity Commission, the Business Analyst will be responsible reporting of consumption relative to target levels (using our data sources) as required by the Directive issued by the Commission.

In the case of daily or real time limits where the Electricity Commission reporting will be too slow for real time action to be taken, the Network Operations Manager with the assistance of the Business Analyst will monitor our 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 when they are made available.

As part of the monitoring process Top Energy is required to report compliance to the Commission (as per SOSOP 11.5) in addition to the daily reporting to the System Operator detailed above.

## 18. Log of Rolling Outages

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



## 19. Contingent Events

If an unplanned event occurs that will alter planned rolling outages, the Control Centre Manager will be responsible for all decisions. Where possible, any changes to the planned timetable should be published on the Top Energy website and communicated to retailers.

## 20. Embedded Generation

Where possible, additional generation capability will always be sought as preferable to the disconnection of hot water or customer supplies. Upon notification of a Developing Event or Immediate Event, Top Energy will liaise with all embedded generators connected to the Top Energy network, to request maximum generation output. The outcomes from these requests will be directly communicated to the System Operator.

## 20. Appendix A – Rolling Outage Log

SUBSTATION \_\_\_\_\_ DATE \_\_\_\_\_

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

Feeder Name	CB Number	Time Opened	Time Closed	Load Shed A	Load Shed B

## 21. Appendix B – Draft Rolling Outage Public Notice

### Electricity Supply Interruptions

Please read - your supply may be affected

Top Energy is being required to reduce electricity consumption with rolling power outages across the Far North to meet a 5% savings target set by the Electricity Commission 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. To find out the priority group of the circuit for your connection, you can check your location against the outage plan map on our website ([www.topenergy.co.nz](http://www.topenergy.co.nz)), or call your electricity retailer.

### 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.
- Avoid using lifts.

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.

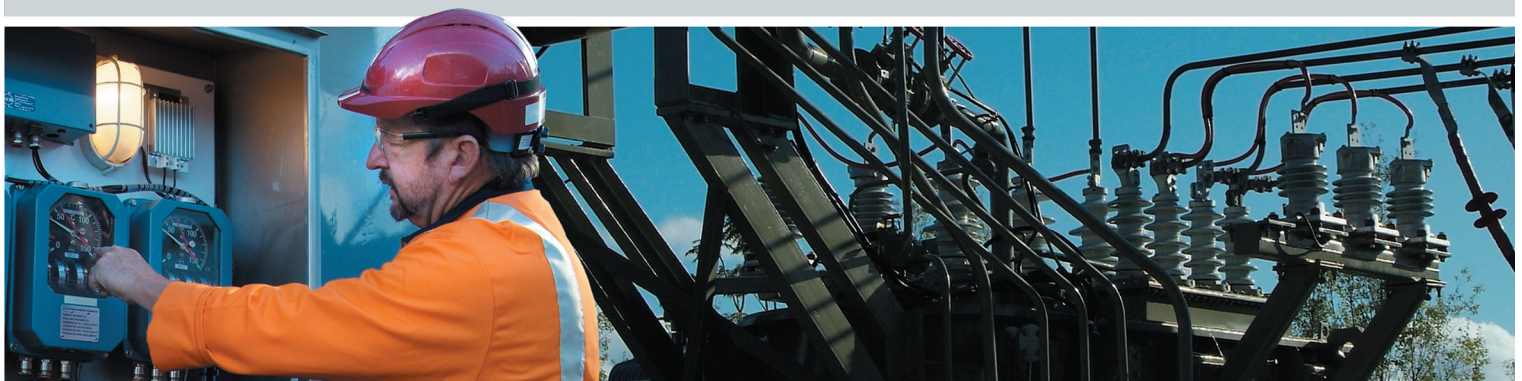
### Outage Schedule

Areas Affected	Priority Group	Monday 4 July 2011	Tuesday 5 July 2011	Wed 6 July 2011	Thursday 7 July 2011	Friday 8 July 2011	Saturday 9 July 2011	Sunday 10 July 2011
Rangiahua	4	8am - 11am	9am- 12pm	1pm - 4pm	2pm- 5pm	3pm - 6pm	8am - 11am	9am- 12pm
Towai	4	9am- 12pm	1pm - 4pm	2pm- 5pm	3pm -6pm	8am - 11am	9am- 12pm	8am - 11am

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



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**TOP ENERGY®**  
Te Puna Hihiko