

CENTRALINES

LIMITED

Security of Supply

Centralines' Participant Outage Plan

Centralines Limited

Approved Plan

CL-FC9014

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ELECTRICITY NETWORK CONTINGENCY PLAN

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31/03/2010	v1.0	New Plan	Unison Operations Manager	Area Services Manager (Centralines)	CEO	N/A
21/05/2010	v1.1	6.3 – description of CL Networks expanded. References to Category A and Category B Events replaced. 18.0 Addition of Savings Schedules from 5% to 25%	Unison Operations Manager	Area Services Manager (Centralines)	CEO	v1.0

Next review date: **1 July 2012**

CORRIGENDA

Applies to current issue of standard only:

Date	Applies to Version	Correction	By

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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.

Centralines Networks Ltd (Centralines) will always endeavour to keep supply on to customers.

3 SCOPE

This plan applies to Centralines and Unison employees, in particular those listed in Section 8 of this plan.

4 RESPONSIBILITIES

4.1	Development & review	Operations Manager
4.2	Authorisation	Area Service Manager (Centralines)
4.3	Approval	Chief Executive
4.4	Education and Training	Operations Manager

5 DEFINITIONS

AUFLS	Automatic Under Frequency Load Shedding
The Commission	The 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)
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.

6 BACKGROUND

6.1 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.

6.2 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 Centralines.

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.

6.3 Centralines Networks Ltd

Centralines Networks Limited, trading as Centralines, is the power lines company that safely delivers electricity to businesses and homes in Central Hawke’s Bay.

The network is managed under contract by Unison Networks Ltd and all contact and positions stated and listed in this document are Unison Networks’ (Unison) personnel.

Centralines has a single grid connection point at Transpower’s Waipawa Substation situated at Onga Onga where four 33kV feeders supply substations situated in Takapau, Waipukurau, Waipawa and Porangahau. An adjacent 33/11kV substation at Onga Onga provides four 11kV feeders for the immediate area.

Centralines has a similar Winter and Summer peak of 20.5MW.

7 RANGE OF EVENTS

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

- Developing Event – 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.

7.1 Major Incident

A Developing or Immediate Event will be classed by Unison as a major incident and the Unison 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 notification procedures described in Unison’s Crisis Communications Plan (FC9002).

8 STAFF RESPONSIBILITIES

Role	Unison Networks Personnel (on behalf of Centralines)
Receive communication from Commission	CEO or Commercial Manager
Receive communication from System Operator	Control Centre
Implement this plan	Operations Manager
Preparation of load shedding schedules	Operations Manager
Customer notification	Release Coordinator
Weekly savings reporting	Commercial Specialist
Revoking rolling outages	Commercial Manager
Reporting to Electricity Commission	Commercial Manager
Reporting to media, public agencies	Commercial Manager
Reporting to CDEM and Lifelines	Operations Manager

9 COMMUNICATION WITH THE COMMISSION

The Commission can contact Centralines using the following details:

Unison Networks Ltd
Fax: 06 873 9300
Ph: 06 873 9433
P.O. Box 555, **Hastings** 4156
1101 Omaha Road, Hastings 4120

Unison on behalf of Centralines 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, **Wellington**
Level 7, ASB Bank Building, 2 Hunter Street, Wellington

10 ACTIONS FOR IMMEDIATE EVENTS

10.1 System Stability

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

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

10.2 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. **Centralines does not participate in this market.**

10.2.1 Disconnecting Customers

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 of 16% of its total load to be **shed** by automatic under frequency relays.

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 Centralines Network the tripping relays are located at Transpower GXP Substation (Waipawa) and individual Zone 1 includes the tripping of Centralines Waipawa Zone Substation via 33kV Feeder CB222.

AUFLS Zone 2

If Zone 1 tripping fails to restore frequency, the next stage, Zone 2 activates. This will disconnect a further 16% of Centralines Network. In the Centralines Network the tripping relays are located at Transpower GXP Substation (Waipawa) and individual Zone 2 includes the tripping of Centralines Takapau Zone Substation via 33kV Feeder CB302.

Manual Shedding

If AUFLS Zone 1 and Zone 2 tripping fails to stabilise frequency, the System Operator will shed more load. Emergency load shedding feeders are listed in *Appendix A*.

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

10.3 Supply Restoration

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.

10.4 Transmission Grid Emergency

The System Operator may request Centralines to reduce load under a grid emergency notice (GEN). Centralines will shed all water heating load. The System Operator will be advised and if more shedding is required the System Operator will instruct the Grid Owner to disconnect load as per the emergency load shedding feeders listed in *Appendix A*.

If a Developing or Immediate Event is in place, the grid emergency will take precedence.

If the Commission declares a supply shortage following a Grid Emergency, then Centralines will respond by implementing rolling outages as described in the following "Developing Events" section.

11 DEVELOPING EVENTS

If the Commission requests through the System Operator a load reduction for a Developing Event, Centralines 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 Centralines would disconnect feeders or groups of feeders where they belong to a parallel or ring supply (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 is generally not an option for energy savings.

12 DECLARATION OF A DEVELOPING EVENT

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.

If the Commission declares a supply shortage the Commission would make the request through the System Operator who will specify the energy savings target to be enforced for a specific region for a specified time-frame.

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

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

13 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.

13.1 Table 1. Priority Loads

Priority	Priority Concern	Maintain Supply to	Examples
1	Public health and safety	Hospitals and emergency operation centres	Waipukurau Hospital; Police Stations/Fire Services/Ambulance Services; Centralines Admin Building; CHBDC Admin Building
2	Important public services	Communication networks, water and sewage pumping	Waipukurau and Waipawa water supply pumps; Waipukurau and Waipawa sewerage pumps; Telephone exchange
3	Public health and safety	Minor health/medical centres, schools, and street lighting	Medical centres; Schools; Colleges; Waipukurau CBD; Waipawa CBD
4	Food production	Dairy farms and food production facilities	Dairy Farms; Bernard Matthews; Silver Fern Farms
5	Residential	Commercial and industrial premises	Irrigation pumps Orchards Small commercial business Residential customers

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 two or more priority 2 connections
Priority 3	All feeders that have an average priority ≥ 2.5 and < 3.5
Priority 4	All feeders that have an average priority ≥ 3.5 and < 4.5
Priority 5	All feeders that have an average priority ≥ 4.5 and < 5

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

13.2 Vulnerable Customers and Priority Sites

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

14 AUFLS UNDER ROLLING OUTAGES

The level of AUFLS during rolling outages needs to be maintained. Centralines will include AUFLS feeder shedding but limit the shedding to ensure that two AUFLS blocks of 16% are maintained. That is, if we shed 25% of our network load we would also shed up to 25% of the AUFLS load.

15 SHUTDOWN NOTIFICATION

When implementing a rolling outage plan, Centralines will notify the outages in a number of ways:

- Public notices - Centralines will place public notice advertisements (see draft in *Appendix C*) providing a rolling outage timetable showing the times and areas affected by rolling outages. The advertisement will provide details of our website page for customers that wish to seek more information.
- Retailer notification - Centralines 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, Centralines will provide 7 days notice of all rolling outage plans, generally publishing and issuing notifications on a Tuesday to apply from the following Tuesday.

16 COMMUNICATION WITH SYSTEM OPERATOR

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

Prior to notifying and implementing a rolling outage plan, Unison may consult with the System Operator Security Coordinator to establish a process for shedding and restoration of Centralines Feeders, 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 2 MW per 5 minutes.

17 GRID EMERGENCY DURING DEVELOPING EVENT

If the system operator declares a grid emergency during a Developing Event, the grid emergency will take priority. As water heating load generally would not be used to reduce load in a Developing Event, Centralines 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 the Grid Owner to disconnect load as per the list of emergency load shedding feeders in *Appendix A*.

After the grid emergency is cancelled the rolling outages pattern would continue.

18 ROLLING OUTAGES STRATEGY AND METHODOLOGY

Unison's Operations Manager and Commercial Manager will review weekly targets and prepare plans for weekly rolling outages based on savings required.

The methodology is:

- Rolling outage feeders will be assigned a priority according to the criteria specified in Section 13. Feeders that belong to AUFULS block 1 and 2 will be excluded from rolling outage groups unless we apply the alternative AUFLS arrangements outlined in Section 14.
- A set of switching instructions will be prepared for each rolling outage group.
- A winter weekday morning (8am to 12pm) and an afternoon (1pm to 5pm) average energy volume will be estimated for each group, based on the average July daytime loadings.
- Unison will provide to the Security Coordinator daily rolling week-ahead load forecast (beginning at a time specified by the System Operator) that forecasts the distributor's reasonable expectation of the half-hourly load at each grid exit point.
- Unison will provide to the Security Coordinator any expected change to the forecast for a grid exit point of more than 20% for any trading period, as soon as reasonably practicable following the distributor becoming aware of the expected change.
- 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%	5
5 to 10%	3, 4 and 5
Greater than 10%	All groups

To the extent possible, outages should be programmed to be held during daylight hours, between 8am and 5pm, 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 Centralines load does not increase or decrease by more than 2MW in any 5 minute period. The Controllers carrying out switching are to monitor their activities in relation to this limit.

Using the methodology and excluding current AUFLS feeders, indicative plans for savings are:

5% schedule			
Group	Cuts per week	Duration (h)	Weekly savings (MWh)
1	6	4	146
2	3	4	66
3	2	4	9
4		4	0
5		4	0
		Total	221
Average winter load			4460
Estimated Savings			5.0%

10% schedule			
Group	Cuts per week	Duration (h)	Weekly savings (MWh)
1	11	4	268
2	7	4	154
3	5	4	22
4		4	0
5		4	0
		Total	444
Average winter load			4460
Estimated Savings			10.0%

15% schedule			
Group	Cuts per week	Duration (h)	Weekly savings (MWh)
1	12	4	292
2	8	4	176
3	8	4	36
4	5	4	73
5	3	4	92
		Total	669
Average winter load			4460
Estimated Savings			15.0%

20% schedule			
Group	Cuts per week	Duration (h)	Weekly savings (MWh)
1	14	4	341
2	10	4	220
3	7	4	31
4	8	4	117
5	6	4	184
		Total	893
Average winter load			4460
Estimated Savings			20.0%

25% schedule			
Group	Cuts per week	Duration (h)	Weekly savings (MWh)
1	14	4	341
2	14	4	308
3	14	4	63
4	13	4	190
5	7	4	214
		Total	1116
Average winter load			4460
Estimated Savings			25.0%

19 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 Commercial Analyst will monitor the Electricity Commission report of our savings results to our target and together with the Commercial or 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 Commercial Analyst will be responsible for daily and weekly reporting of consumption relative to target levels (using our data sources) to the Security Coordinator and the Electricity 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 Operations Manager with the assistance of the Commercial Specialist will monitor our savings and adjust accordingly in the timeframe required. These savings will be calculated using GXP loads measured by our metering and SCADA system and compared with the targets supplied by the System Operator.

20 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 B*.

21 CONTINGENT EVENTS

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

22 CLARIFICATION

22.1 Clarification of any matter referred to in this document should be directed to the Unison Operations Manager.


23 IMPLEMENTATION, REVIEW AND REVISIONS

23.1 The Plan shall be subject to review every two (2) years or earlier if required.

24 APPROVALS

Prepared by: Nigel Brown
Operations Manager

Signature:



21/5/2010

Date:

Authorised by: Brad Thomas
Area Services Manager (Centralines)

Signature:



21/5/10

Date:

Approved by: Ken Sutherland
Chief Executive

Signature:

Date:



21/05/2010

25 APPENDIX A – EMERGENCY LOAD SHEEDING PRIORITIES BY FEEDER

Sub	Feeder Number	No of Customers					Overall Priority
		Priority 1	Priority 2	Priority 3	Priority 4	Priority 5	
OngaOnga	1	1		2		385	1
OngaOnga	2	1		1	5	438	1
OngaOnga	3		1	1	5	284	3
OngaOnga	4				3	133	5
Waipukurau	13	1	1			285	1
Waipukurau	14	4		2		212	1
Waipukurau	15		2	5		681	2
Waipukurau	17	1			1	31	1
Waipukurau	18			1		1186	5
Waipukurau	19					556	5
Waipawa	83		1			466	5
Waipawa	85	3	2	1		739	1
Waipawa	86		1	3		656	3
Waipawa	88					310	5
Waipawa	91				2	230	5
Takapau	71				1		3
Takapau	73				1		3
Takapau	74	2	2	2		405	1
Takapau	75					145	5
Takapau	76					88	5
Takapau	78					53	5
Wilder Rd	45		2	1		414	2
Wilder Rd	46					365	5

27 APPENDIX C – DRAFT ROLLING OUTAGE PUBLIC NOTICE

Electricity Supply Interruptions

Please read - your supply may be affected

Centralines is being required to reduce electricity consumption with rolling power outages across Central Hawke’s Bay region 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.

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	8-12am	8-12am	1-5pm	1-5pm	
B	2	8-12am		1-5pm		
C	1		8-12am			1-5pm
D	2		8-12am		1-5pm	
E	1		8-12am		1-5pm	

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