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Participant Rolling Outage Plan

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1. Document Overview

1.1. Document Purpose

This plan was written to comply with the System Operator Rolling Outage Plan (SOROP). The SOROP is prepared and published by the System Operator and approved by the Electricity Authority.

The plans outlined are prepared in accordance with the requirements of clauses 9.6 to 9.8 of Part 9 of the Electricity Industry Participation Code ('The Code'). These require each specified participant, in this case: Counties Energy Limited (CEL), to prepare and publish a Participant Rolling Outage Plan ('PROP') consistent with the System Operator Rolling Outage Plan ('SOROP').

The PROP advises the System Operator and the public of CEL's planned response to a declared 'Supply Shortage Declaration' if issued by the System Operator. Typical scenarios where this plan may be enacted are in response to major generation shortages and/or significant transmission constraints. Typical scenarios include:

- unusually low inflow into hydro-generation facilities
- loss of multiple generating stations, or
- multiple transmission failures

The main energy saving measure listed is rolling outages, the structure and implementation of these are summarised in this document.

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

- reduce electricity consumption when requested by the System Operator
- comply with the requirements of the System Operator Rolling Outage Plan (SOROP)
- comply with Electricity Industry Participation Code 2010
- supplement the System Operator Rolling Outage Plan (SOROP)

Reducing demand by disconnecting supply to customers will be treated as a last resort. It will only be implemented after all other forms of savings (including voluntary savings) have been exhausted. CEL will always endeavour to keep supply on to customers. CEL will only disconnect customers when directed to by the System Operator.

1.2. Intended Audience

This document applies to all Counties Energy staff responsible for the implementation of the PROP as per Section 5 of the plan.

This document is available to the public on Counties Energy's website.

1.3. Related References

External documents:

- Electricity Industry Participation Code 2010

2. Definitions and Abbreviations

Term/Abbreviation	Description
Act	Electricity Industry Act 2010 and subsequent amendments
AUFLS	Automatic Under-Frequency Load Shedding
Authority	Electricity Authority
Code	Electricity Industry Participation Code 2010 Part 9 (Security of Supply)
CEL	Counties Energy Limited
Electricity Act	Electricity Industry Act 2010
Feeder	A high voltage supply circuit typically supplying up to 3000 customers at 11 kV or 22 kV.
GXP	Transpower Grid Exit Point
GEN	Grid Emergency Notice
NOC	Network Operations Centre
PROP	Participant Rolling Outage Plan (this plan)
Regulations	The Electricity Industry Participation Code 2010
Retailers	Electricity Retail Companies
Rolling Outages (Cuts)	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.
SO	System Operator of the national electricity transmission grid.
SOROP	System Operator Rolling Outage Plan
Supply Shortage Declaration	Declaration made by the system operator.

3. Background

3.1. Electricity Authority

The Electricity Authority is an independent Crown entity responsible for the efficient operation of the New Zealand electricity market.

The core functions of the Authority are to:

- make and administer the Electricity Industry Participation Code 2010 (Code) governing the New Zealand electricity market
- undertake market-facilitation measures (such as providing education, guidelines, information, and model arrangements) and monitor the operation and effectiveness of market-facilitation measures
- monitor and enforce compliance with the Code, various regulations, and the Act
- proactively monitor the performance of the electricity industry in regard to competition, reliable supply and efficient operation
- contract service providers to operate the New Zealand electricity system and market in accordance with the Code

3.2. Transpower

Transpower is a State-Owned Enterprise that owns and operates New Zealand's National Grid. The National Grid is the network of high voltage transmission lines and substations that transports bulk electricity from generation sources to distribution line companies, such as CEL.

As System Operator, Transpower manages the real-time operation of New Zealand's electricity transmission system. It ensures that, at any one point in time, the energy supplied to the network is matched by the energy demand of all the loads supplied by the network.

3.3. Counties Energy Limited (CEL)

CEL is an electricity distribution business that supplies and maintains electricity infrastructure. CEL delivers energy to over 50,000 homes, businesses and organisations throughout the South Auckland and Northern Waikato regions.

The company employs approximately 250 people and has its offices in Pukekohe.

4. Range of Events

Events that could lead the System Operator to make a Security of Supply Emergency declaration can, in general terms, be categorised as:

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

4.1. Major Event

CEL classifies both event types as major events, and its management team will activate the appropriate contingency and management plan.

Communication with retailers, civil defence and other stakeholders will be carried out in accordance with normal notification procedures.

5. Counties Energy Employee Responsibilities

The table below lists the specific roles and responsibilities associated with the actions in this plan.

Responsibility	Role
Receive communication from system	Head of Customer and Energy Experience
Operator	Chief Customer & Operations Officer
Implement this plan	Head of Customer and Energy Experience
Preparation of load shedding	Head of Customer and Energy Experience
Schedules	Head of Network Development
Customer notification	Head of Customer and Energy Experience
Weekly savings reporting	Head of Customer and Energy Experience
Revoking rolling outages	Head of Marketing and Communications
Reporting to the System Operator	Head of Marketing and Communications

6. Communication With the System Operator

The System Operator will use the following contact details to communicate with CEL for all purposes:

Operational Contact: Counties Energy – NOC	Managerial Contact: Counties Energy – Head of Customer and Energy Experience
Email: networkcontroller@countiesenergy.co.nz	Email: joshua.moore@countiesenergy.co.nz
Phone: 09 238 1764 027 495 3929	Phone: 027 527 1067

CEL will contact the System Operator for administration purposes (including reporting performance against targets) using the following details:

Transpower – System Operator	Waikoukou
Phone: 04 590 7000	22 Boulcott Street
Email: systemoperator@transpower.co.nz	PO Box 1021
	Wellington

All other communications with the System Operator will occur between CEL's Network Operations Centre (NOC) and Transpower's Regional Operating Centre (RCN Otahuhu). Communication will be via Transpower's TSX telephone or other standard communication systems.

Upon receipt of direction to save energy from the System Operator, CEL will acknowledge this receipt by email.

Prior to notifying and implementing a rolling outage plan, CEL will consult with the System Operator Security Coordinator to establish a process for shedding and restoration. This may include an MW load cap to operate under during restoration phases.

7. Actions For Immediate Events

7.1. System Stability

Transpower, as the System Operator, is required to keep enough reserve generation to cover the risk of the largest connected generator tripping or HVDC link failure. They are also required to keep the system frequency at 50 Hz. If a large generator trips, it can cause a reduction in frequency. If the frequency is not rectified, additional generators may trip, potentially leading to a cascading failure of the transmission system.

As reserve generation cannot immediately pick up the load of a disconnected generator, an immediate load reduction is required until additional generation can pick up the load. Automatic load shedding groups reduce load in stages until the frequency stabilises.

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

- an instantaneous reserve market – see Section 7.2
- disconnecting customers – see Section 7.3

7.2. Reserve Market

Generators with reserve capacity and load users with interruptible load (such as distribution networks) may offer reserve capacity to the Instantaneous Reserves Market to cover the risk of:

- the largest generating unit, or
- a critical transmission line tripping

CEL offers part of its interruptible load, predominantly water heating, into the Reserve Market.

Generally, water-heaters are only off for short periods, during which their inherent thermal capacity ensures limited impacts on customers. Once failed generation or transmission equipment is back in service, water heating and other controlled loads are gradually restored.

7.3. Disconnecting Customers

7.3.1. 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 have sufficient load available to shed, in compliance with the AUFLS Technical Requirements. The system is designed to ensure network stability by disconnecting load in response to under-frequency events. At CEL, AUFLS is implemented at the distribution feeder level, initiated by relays located at zone substations.

7.3.2. AUFLS Framework (4-block Scheme)

The updated AUFLS scheme is divided into four blocks, each with specific settings and requirements.

AUFLS Block	Settings and Requirements
AUFLS Block 1	If the system frequency fails to recover after the Reserve Market load shed, AUFLS Block 1 shedding will occur by disconnecting 10% of CEL's load at a minimum. The activation condition for Block 1 is as follows: Begins within 0.3 seconds after the frequency drops to or remains at or below 47.9 Hertz.
AUFLS Block 2	If Block 1 tripping fails to restore frequency, the next stage, Block 2, activates. This will disconnect a further 10% of CEL's load at a minimum. The activation conditions for Block 2 are below. - Begins 15 seconds after the frequency drops to or remains at or below 47.9 Hertz. - Begins within 0.3 seconds after the frequency drops to or remains at or below 47.7 Hertz.
AUFLS Block 3	If Block 2 tripping fails to restore frequency, the next stage, Block 3, activates. This will disconnect a further 6% of CEL's load at a minimum. The activation conditions for Block 3 are below. - Begins 15 seconds after the frequency drops to or remains at or below 47.7 Hertz. - Begins within 0.3 seconds after the frequency drops to or remains at or below 47.5 Hertz.
AUFLS Block 4	If Block 3 tripping fails to restore frequency, the next stage, Block 4, activates. This will disconnect a further 6% of CEL's

AUFLS Block	Settings and Requirements
	load at a minimum. The activation conditions for Block 4 are below. • Begins 15 seconds after the frequency drops to or remains at or below 47.5 Hertz. • Begins within 0.3 seconds after the frequency drops to or remains at or below 47.3 Hertz. • Begins within 0.3 seconds after the frequency falls and remains falling at 1.2 Hertz per second. The frequency is below 48.5 Hertz.

7.3.3. Manual Shedding

If the AUFLS Block 1, 2, 3 and 4 tripping fails to stabilise frequency, the System Operator will shed more load. Once the frequency has stabilised, the System Operator will advise the CEL – NOC when load can be restored.

7.4. Supply Restoration

Disconnected load must be restored in conjunction with the System Operator. This is to prevent overloading the transmission grid and/or creating further instability.

7.5. Transmission Grid Emergency

The System Operator may ask CEL to reduce load under a grid emergency notice (GEN). CEL will shed all available controllable load¹ and advise the System Operator. If further shedding is required, the System Operator will instruct the Grid Owner to further disconnect load by shedding feeders to provide a nominated demand reduction.

During a GEN, feeder shedding must be undertaken following the same prioritisation as indicated in the table in Section 10.1.

If a GEN is declared while an Immediate Event is in place, the GEN will take precedence.

If the System Operator declares a supply shortage during a GEN, CEL will respond by implementing rolling outages as described in Sections 8 to 17.

8. Developing Events

If the System Operator requires a load reduction for a planned Developing Event, CEL must reduce supply to customers in a controlled manner to meet the targets. The targets are likely to be in the form of a weekly energy savings target and reviewed each week. To reduce energy usage, CEL would disconnect feeders or groups of feeders in a controlled manner to enable targets to be reached.

CEL has a legal obligation to comply with the targets specified by the System Operator. Water heating load shedding is generally not an option for energy savings, as this only defers usage.

¹ Controllable load that has not already been bid into the Reserves Market (see Section 7.2).

9. Declaration of a Developing Event

The System Operator will endeavour to provide nine days' notice of:

- the requirement for weekly energy savings, or
- any increase in the weekly energy savings target

The System Operator will specify the energy savings target to be enforced for a specific region for a specified timeframe.

On receipt of a declaration of a Developing Event, CEL will update Appendix A with current load data.

The System Operator will begin an Official Conservation Campaign if either New Zealand or South Island storage reaches the Emergency Zone.

When requested, the System Operator is expected to manage general media advertising relating to the need to conserve electricity and any impending rolling outages.

10. Criteria for Rolling Outages

The following table shows the desired criteria for selecting rolling outage feeders to be included in rolling outages. This is to ensure public health and safety are preserved, and costs to the economy are minimised. 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. Lowest priority (6) loads will be scheduled for interruption before higher priority loads (1).

Some feeders have a diverse range of customer types connected. In some circumstances, the predominant customer type has been used to categorise the feeder priority.

10.1. Priority Loads

Priority	Priority Concern	Maintain Supply to...
1.	Public health and safety	Critical health and disability services, e.g. major hospitals, air traffic control centres, emergency operation centres.
2.	Important public services	Lifelines infrastructure, e.g. energy control centres, water and sewerage pumping, major ports, public passenger transport.
3.	Public health and safety	Vulnerable sectors, e.g. rest homes, prisons, medical centres, schools, fuel delivery systems, communication networks, streetlighting.
4.	Animal health and food production/storage	Dairy farms, milk production facilities, chicken sheds, cool stores and

Priority	Priority Concern	Maintain Supply to...
		supermarkets.
5.	Maintaining production	Central business districts, commercial and industrial premises.
6.	Avoiding disruption to households	Residential premises.

10.2. Vulnerable Customers and Priority Sites

It is not possible for CEL to prevent rolling outages from affecting individual vulnerable customers or priority sites. In addition to prioritising feeders when planning rolling outages, CEL will:

- provide information through public notices and its website to inform vulnerable customers of the potential risks associated with rolling outages
- request that retailers consider directly notifying their vulnerable customers about the potential for rolling outages and the steps they should take to prepare.

10.3. Retailer Agreements

CEL currently has no contractual restrictions with retailers or consumers that would adversely affect its ability to comply with System Operator directions.

11. AUFLS Criteria

The Block 1, 2, 3 and 4 load blocks must be maintained during rolling outages. The criteria used to select feeders for the AUFLS scheme are very similar to the criteria for rolling outages, as shown in the table in Section 10.1. As a result, AUFLS load blocks are predominantly from lower priority load categories. CEL will include AUFLS feeders in shedding but will limit the participation ratio to ensure the minimum load percentage of each block is maintained.

12. Shutdown Notification

Depending on the notice provided by the System Operator, it may not be feasible to use CEL's standard planned outage notification process due to the wide-scale impact of rolling outages.

When implementing a rolling outage plan, CEL will endeavour to provide as much notice as possible to connected customers. Where the System Operator has provided nine days' notice, CEL will endeavour to:

- where an email address for a customer is held, provide email notification to affected customers with seven days' notice
- where an email address for a customer is held, provide a reminder email one day prior to the outage
- communicate outage plans to customers using our Outage Hub web app

- inform customers of outage plans using Facebook
- provide outage information under the relevant CEL phone line key, press selection
- communicate with our customers throughout via our Customer Services Team
- provide retailers with notification of outages, using standard Electricity Information Exchange Protocols (EIEP5)

No personalised notification will be sent to the customer where:

- a retailer has not provided CEL with a customer's email address via the Electricity Information Exchange Protocols (EIEP4)
- CEL holds no email address for a customer

Due to the probable volume of notifications necessary and the relatively short timeframes, traditional mail is unlikely to be feasible. Likewise, where a phone number is held for these customers, a phone call is unlikely to be practicable.

13. Grid Emergency During a Development Event

If the System Operator declares a GEN during a Developing Event, the GEN will take priority. As controllable load generally would not be used to reduce load in a Developing Event, CEL would likely have controllable load² available for load reduction when required for the GEN. This load would be shed, the System Operator advised, and if more shedding is required, the System Operator will instruct CEL to disconnect additional load. The rolling outage feeders may have to be rearranged to comply with the GEN.

After the GEN is cancelled, the rolling outages pattern would continue.

14. Rolling Outages Strategy and Methodology

Counties Energy's rolling outage methodology is designed to achieve required load reductions while:

- minimising customer impact
- ensuring outages are distributed fairly across the network

Key elements of the approach include:

- **Feeder Prioritisation:** All feeders are assigned priority ratings based on the highest-priority customers connected to them. Where possible, network switching arrangements allow higher-priority customers to remain supplied while lower-priority sections of a feeder are interrupted, creating additional lower-priority outage options.
- **Time-Based Prioritisation:** Recognising that outage impacts vary throughout the day and week, additional priority ratings are applied during overnight, weekend, and peak-demand periods. This allows outage selection to favour

² Dependent on the amount of controllable load not already bid into the Reserve Market (see Section 7.2).

feeders where interruptions will have the least customer impact at that specific time.

- **Fair and Balanced Selection:** Rolling outage decisions are made using a data-driven process that considers:
 - feeder priority
 - the number of affected customers
 - recent outage history

This helps ensure lower-priority feeders are selected first while avoiding repeated interruptions to the same customers.

- **Flexible Load Shedding:** The programme can be adjusted to meet either energy-saving targets or maximum demand limits specified by the System Operator. A dedicated load-shedding scheduling tool determines feeder selections, outage schedules, and switching instructions.
- **Customer Impact Mitigation:** Counties Energy seeks to:
 - limit outage durations
 - accommodate specific customer needs, where practical
 - progressively expand outage eligibility only as higher levels of load reduction are required
- **Operational Constraints and Network Stability:** All switching and restoration activities are planned to:
 - maintain network stability
 - minimise impacts on voltage and frequency
 - comply with limits on the rate at which load can be disconnected or restored (maximum 25 MW every five minutes)

Overall, the methodology balances regulatory requirements, system reliability, fairness and the minimisation of customer disruption. This helps ensure load shedding is implemented in the most equitable and operationally effective manner possible.

14.1. Implementation

Following a supply shortage declaration to reduce demand, rolling outages will be implemented as per this plan. The Head of Customer and Energy Experience will ensure:

- load shedding schedules are prepared
- duty controller rosters are adjusted, as required
- the system load is monitored daily to meet desired targets

The Head of Customer and Energy Experience and the Head of Network Development will:

- review weekly targets
- prepare plans for weekly rolling outages based on the required savings

These will be approved by the Chief Customer & Operations Officer.

14.2. GXPs

Feeders that could be subject to rolling outages will be separately shown as belonging to zone substations and GXPs. CEL has two GXPs:

GXP	TP Voltages	CEL Voltages	Rolling Outages may occur? Yes / No
BOB1101	110 kV	110 kV	Yes
GLN0332	220 kV	33 kV	Yes

14.3. Savings Plan

5% Savings Plan			
Group Priority	Average Cuts per Week	Average Duration (hrs)	Weekly Savings (MWh)
1	0	0	0
2	0	0	0
3	0	0	0
3	0	0	0
5	2.7	6.0	333
6	3.4	6.0	399
Average Weekly Winter Volume			14.626
Estimated Percentage Savings			5.00%

10% Savings Plan			
Group Priority	Average Cuts per Week	Average Duration (hrs)	Weekly Savings (MWh)
1	0	0	0
2	0	0	0
3	0	0	0
3	2.3	7.0	247
5	5	7.0	635
6	4.2	7.0	581
Average Weekly Winter Volume			14,626
Estimated Percentage Savings			10.00%

15% Savings Plan			
Group Priority	Average Cuts per Week	Average Duration (hrs)	Weekly Savings (MWh)
1	0	0	0
2	0	0	0
3	3.2	7.2	186
3	5.6	7.2	506
5	6.0	7.2	784
6	5.2	7.2	718
Average Weekly Winter Volume			14, 626
Estimated Percentage Savings			15.00%

20% Savings Plan			
Group Priority	Average Cuts per Week	Average Duration (hrs)	Weekly Savings (MWh)
1	0	0	0
2	0	0	0
3	3.8	8.2	241
3	7.0	8.2	676
5	7.0	8.2	1048
6	5.9	8.2	960
Average Weekly Winter Volume			14, 626
Estimated Percentage Savings			20.0%

25% Savings Plan			
Group Priority	Average Cuts per Week	Average Duration (hrs)	Weekly Savings (MWh)
1	0	0	0
2	0	0	0
3	0.8	10.5	69
3	6.8	10.5	865
5	7.0	10.5	1415
6	6.3	10.5	1308
Average Weekly Winter Volume			14, 626
Estimated Percentage Savings			25.00%

15. Target Monitoring

To avoid discrepancies over the accuracy of different data sources, the System Operator will report on actual demand versus the target.

For load shedding to a weekly target, the Head of Network Development will:

- monitor our actual cumulative savings compared to our target, and together with the Head of Customer and Energy Experience
- adjust future load shedding as required to increase or decrease the number of rolling outages and enable the weekly target to be met

The Head of Customer and Energy Experience will be responsible for:

- daily and weekly reporting to the System Operator of consumption relative to target levels
- providing to the System Operator the predicted load for the next week on a seven-day rolling basis. GXP will make this prediction for each half hour
- rolling seven days planned outage list which will include daily outage start and restore time per GXP

16. Log of Rolling Outages

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

The CEL Outage Request System (Salesforce) will also capture detailed switching and specific action times under each feeder outage identified during the planning process.

17. Contingent Events

If an unplanned event occurs that will alter planned rolling outages, the Incident Controller and Head of Customer and Energy Experience will be responsible for all decisions. Where possible, any changes to the planned timetable should be published on CEL's website and communicated to retailers. The Head of Customer and Energy Experience will also advise the SO Security Coordinator.

Appendix B – Document Changelog

Changes to this document are listed below.

Date	Version No.	Key Changes Made	Document Owner Role
March 2010	1.0	New document.	GM Network
February 2012	2.0	Full review completed.	GM Network
April 2014	3.0	Full review completed.	GM Network
Jan 2022	4.0	Full review completed.	GM Network
March 2024	5.0	Full review completed.	GM Network
29/07/2026	6.0	Document updated and moved to the company's new controlled document template and system. Full review completed.	Chief Customer & Operations Officer

Note: Refer to previous archived versions to view the changes made to the document.