



PARTICIPANT OUTAGE PLAN
Version 5
12 August 2010

NETWORK POLICY PARTICIPANT OUTAGE PLAN

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INTRODUCTION

Alpine's Participant Outage Plan has been written to conform to the requirements set out in the Electricity Commission's Security Of Supply Outage Plan (current version October 2009).

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.

Responsibilities

Approval: Chief Executive Officer

Review/Revision: Compliance and Training Manager

Note: any alteration to this policy must obtain final approval from the Electricity Commission.

The policies outlined in this document are to be used for within all Alpine's area of operations.

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This document has been written for the purpose of the Electricity Governance (Security of Supply) Regulations 2008.

Any use outside of the Electricity Generation, Transmission, and Distribution industry is unauthorised.

AMENDMENT RECORD

| Amendment Number | Page No Amended | Date of Amendment | Amender |
|------------------|-----------------|-------------------|---------|
| Version 2 | All | 4 June 2010 | S Small |
| Version 3 | All | 2 July 2010 | S Small |
| Version 4 | 13 | 21 July 2010 | S Small |
| Version 5 | 3, 12-13 | 12 August 2010 | S Small |
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The above table lists the amended pages in this standard which have been distributed following the initial issue of this standard.

Amendments are marked with an issue number and date in the bottom left hand corner of the page.

1. GENERAL

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

This Participant Outage Plan should be read in conjunction with Alpine's Emergency Preparedness Plan which provides detailed contingency and emergency procedures; and specifies staff roles, emergency contact lists, resource allocation, communications etc.

1.1 Aims and Objectives

This document meets Alpine's obligations to the Electricity Governance (Security of Supply) Amendment Regulations 2009 to prepare and publish a Participant Outage Plan for approval by the Electricity Commission.

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.
- Comply with 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. Alpine will always endeavour to keep supply on to customers.

1.2 Related Standards

Electricity Governance (Security of Supply) Amendment Regulations 2009

Electricity Commission Security of Supply Outage Plan

Other Network Standards relating to this standard are:-

- (a) Health and Safety Management Plan.
- (b) Emergency Preparedness Plan

1.3 Definitions

| | |
|-------------------------------------|--|
| Alpine: | Alpine Energy Ltd |
| AUFLS: | Automatic Under Frequency Load Shedding. |
| The Commission: | Electricity Commission. |
| Feeder: | A high voltage supply line averagely supplying 350 customers. |
| GXP: | Transpower Grid Exit Point. |
| LSI: | Lower South Island load management |
| GEN: | Grid Emergency Notice. |
| POP: | Participant Outage Plan (this plan) |
| Retailers: | Electricity retail companies. |
| Rolling Outages: | Planned electricity disconnections spread over different parts of the network at differing times to avoid prolonged outages at any one location. |
| 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. |
| USI: | Upper South Island load management |

2. BACKGROUND

2.1 Electricity Commission Provisions

The role of the Electricity Commission is to implement emergency measures only if it considers that industry participants will fail to implement emergency measures sufficient to avoid possible energy shortage i.e. if planned outages are not implemented, larger unplanned outages are likely.

Implementation of emergency measures will likely be the result of either a Developing or Immediate Event:

Developing Event: an event that evolves over time, for example, a period of unseasonably low inflows to hydro catchments

Immediate Event: an event that occurs with little or no warning, usually as a result of a transmission or major power station failure.

Plans to implement rolling outages must provide for both categories, including providing for a situation which has elements of both events at the same time

There are 4 phases of response during a security of supply situation:

Security Normal Phase: Modelled risk of energy shortage is less than 1%. The Commission monitors and publishes regular forecasts of security levels in the form of assessments of hydro storage relative to Hydro Storage Guidelines.

Security Watch Phase: Modelled risk of energy shortage reaches 1%. The Commission increases the frequency of monitoring and publishes regular updates.

Security Alert Phase: Modelled risk of energy shortage reaches 4%. The Commission communicates with stakeholders, intensifies monitoring activity, and activates an emergency response structure.

Security Emergency Phase: Modelled risk of energy shortage reaches 10%, or asset outages create a similar risk of shortage. The Commission communicates with stakeholders and oversees the implementation of emergency measures.

2.2 Opuha Dam

Opuha Dam generates 7 MW of electricity which is periodically injected into Albury GXP, Contact Energy operates this facility, and Alpine has no input into any scheduling and nor do we have any supply agreement with Contact Energy.

Additionally the conditions imposed in Opuha's resource consents do not allow them to generate at will.

Therefore the assumption has been made that the 7 MW from Opuha Dam would be unavailable.

2.3 Overlap with Civil Defence Emergency

It is possible that a natural disaster could cause a major transmission or generation outage and could also lead to the declaration of a state of national emergency or local emergency under the Civil Defence Emergency Management Act 2002.

Alpine shall manage our response to a Civil Defence emergency declaration as per the Civil Defence Emergency section in the Alpine Emergency Preparedness Plan.

2.4 Overlap with Grid Emergency Notice

If the Commission has made a supply shortage declaration in response to a Developing Event and directs rolling outages, then Alpine shall implement rolling outages in order to meet savings targets.

If a Grid Emergency is declared during the time the supply shortage declaration is in force, Alpine will give priority to actions required to avert the Grid Emergency.

Should an Immediate Event occur, it is likely that the System Operator will activate the Grid Emergency provisions and require action from Alpine (if affected).

Accordingly, it is likely that Alpine will be acting under a Grid Emergency Notice (GEN) and responding to requests from the system operator. The GEN will persist for the period specified by the System Operator.

If a Grid Emergency is likely to persist for a sustained period, the Commission, after consultation with the System Operator, may make a supply shortage declaration.

The Commission will take this action if it considers that there is a high probability that the incidence of a Grid Emergency for a sustained period would be more appropriately managed by rolling outages.

2.5 Overlap with Automatic Under Frequency Load Shedding

As part of the Grid Emergency arrangements, Transpower, as the grid owner, is required to provide Automatic Under Frequency Load Shedding (AUFLS) in response to a significant drop in frequency, which it undertakes at selected Alpine grid exit points (GXP's) as either part of the Upper South Island (USI) load management or Lower South Island (LSI) load management.

Alpine's AUFLS obligation is for 2 x 16% blocks of load to be available at all times at each selected grid exit point (GXP) to cover for system events that are larger than those events covered by the Commission purchasing instantaneous reserves. Timaru GXP has been selected for AUFLS with 5 feeders allocated.

Alpine currently has 6 active GXP's (Albury, Studholme, Temuka, Tekapo, Timaru, and Twizel) with 2 in development (Bells Pond and Cooneys Road); due to our unique geographic location these are split between Transpower's USI and LSI load management, therefore to simplify an assumption has been made that both USI and LSI load management would be activated together rather than independently.

The need to keep available the 2 x 16% blocks of load free for AUFLS has been factored into Alpine's Rolling Outage savings calculations.

3. IMPLEMENTATION

3.1 Authorisation to Activate Participant Outage Plan

After Declaration from the Electricity Commission, The Alpine Participant Outage Plan shall be activated on the authorisation of the Chief Executive Officer - or the Operations Manager in his absence.

Unless urgent, all Alpine planned outages for maintenance will be cancelled during the period of rolling outages.

3.2 Communication Strategy

Alpine will utilise the following pathways for the following types of communication:

1. Administratively directly with the Commission which shall be undertaken by the Chief Executive Officer.

Administrative communications include the following:

- Any declaration of a supply shortage by the Commission;
- Any revocation of a supply shortage declaration by the Commission;
- Providing a participant outage plan to the Commission;
- Any notice to approve or to decline to approve a participant outage plan;
- Any advance notice of a possible declaration of a supply shortage or revocation of a supply shortage declaration;
- Reporting by participants on compliance with the Regulations and any directions received under the Regulations

Written communications shall be emailed to andrew.tombs@alpineenergy.co.nz or shall be faxed to Alpine Energy (03) 684-8261.

Telephone communications shall be by landline (03) 6874-300.

2. Operationally via the System Operator which shall be undertaken by Alpine's Network Controllers from the Control Room.

Operational communications include:

- Any direction to implement rolling outages, including savings targets;
- Any advance notice of savings targets;
- Any information provided by participants on demand forecasts, the nature and extent of outages, and the level of electricity savings being experienced;
- Any process to restore load following rolling outages;
- Any information about the possible overlap between Grid Emergencies, automatic under-frequency load shedding (AUFLS) and the implementation of rolling outages.

Written communications shall be emailed to operations@alpineenergy.co.nz or shall be faxed to Alpine Energy Control Room (03) 684-2770.

Telephone communications shall be by landline (03) 687-4324

3. Communication with the media, stakeholders, and other distribution and transmission networks shall be the responsibility of the Chief Executive Officer (as set out in the Emergency Preparedness Plan).

4. Public messages via the media shall be organised by the Chief Executive Officer; after discussion with the Electricity Commission to co-ordinate efforts and ensure consistency of the message, and shall be executed by the corporate services team (as set out in the Emergency Preparedness Plan).
5. Liaison with NZ Police, Civil Defence Emergency Management, Timaru District Council, Mackenzie District Council, Waimate District Council, and other local authorities, utilities, and emergency services shall be the responsibility of the Compliance and Training Manager (as set out in the Emergency Preparedness Plan).
6. Communication with the general public, major consumers, and retailers shall be the responsibility of the corporate services team, overseen by the Corporate Services Manager (as set out in the Emergency Preparedness Plan) as listed below:

| Media | Fax/Email | Phone |
|--------------------|-------------------------|--------------|
| Classic Hits | 03 6886733 | 03 6848152 |
| Port FM | 03 6848926 | 03 6889889 |
| Radio NZ (Monique) | 03 3745115 | 09 3600330 |
| Timaru Herald | 03 6881042 | 03 6844129 |
| TVNZ (Joy Reid) | newsch@tvnz.co.nz | 03 9618574 |
| Radio Live (Helen) | news@radiolive.co.nz | 09 3600330 |
| NewsTalk ZB | chnews@newstalkzb.co.nz | 03 3633555 |

| Retailers | Fax/Email | Phone |
|----------------------------|------------------|--------------|
| Contact Energy | 04 463-9160 | 0800 809-000 |
| Contact Energy Call Centre | 03 577-2001 | 0800 809-000 |
| Trustpower | 07 574-4804 | 0800 442-222 |
| Meridian Energy | 0800 497-498 | 0800 663-743 |
| Genesis Energy | 0800 110-999 | 0800 300-400 |

7. The public will also be advised by way of the 'Network Status' page on the Alpine website www.alpineenergy.co.nz.

4. ROLLING OUTAGES

4.1 Criteria for Rolling Outages

When determining implementation of rolling outages Alpine Energy has utilised fundamental risk management principles to ensure minimum disruption to public health and safety infrastructure, and that costs to the economy are minimised.

Accordingly, the following outlines Alpine's priority considerations:

| Priority | Priority Concern | Maintain Supply to: |
|---------------|--------------------------------------|---|
| 1 (High) | Public health and safety | Alpine Energy Control Room and Depot Timaru Hospital (SCDHB), Bidwill Trust Hospital. Timaru DC, Mackenzie DC, Waimate DC emergency operation centres. Police, Fire and Ambulance infrastructure |
| 2 (High) | Important public services | Communication networks. Water and sewage pumping. Fuel delivery services and depots. Prime Port Timaru. Timaru Airport, Mt Cook Airport, Pukaki Airfield, Tekapo Airfield. |
| 3 (Medium) | Public health and safety | Medical centres, rest homes and residential care facilities. Schools, churches and public halls acting as CD facilities. Street lighting and traffic signals. |
| 4 (Medium) | Major food production and/or storage | Fonterra Clandeboye, NZ Dairies Ltd Studholme. Alliance Smithfield, Silver Fern Farms Pareora. Cool store and blast freezer facilities in Timaru. |
| 5 (Low) | Domestic production | Large commercial and industrial premises situated mainly in Smithfield, Washdyke and Redruth suburbs; and adjacent to PrimePort. |
| 6 (Low) | Disruption to consumers | Commercial and industrial premises. Residential premises. |
| 7 (Low) | Disruption to rural areas | Rural premises. Irrigation pumping |

As rolling outages are implemented on a feeder by feeder basis, it is not possible to discriminate between individual connections - this has been taken into account in feeder allocation.

Note: Some critically important infrastructure has invested in alternate generation; therefore it may be allocated a lower priority than non-critical infrastructure which has none (e.g. Timaru Fire station has an 85 kVA diesel generator capable of carrying 80% load for 24 hrs, Timaru Hospital has a diesel generator capable of carrying 100% load for 7 days).

As it is not feasible for Alpine to prevent rolling outages affecting individual vulnerable consumers, Alpine will endeavour to give retailers as much advance notice as possible of pending rolling outages to enable them to notify medically dependant customers.

When implementing rolling outages the time of year has been taken into consideration for the following reasons:

- Within our network's footprint we have a high percentage of intensively irrigated farmland, especially for dairy farming.
This causes huge load shift on our rural feeders during the irrigation season (typically November-April) of approximately 15% of our total load.
During these months dairy milking activity occurs early in the morning and late afternoon therefore where possible we can offload the full day irrigation component of this load but not the milking shed component (for animal health requirements).
- Additionally we have 2 dairy factories within our network (Fonterra - Clandeboye and New Zealand Dairies Ltd - Studholme) which not only consume 35% of our available load; but due to the environmental impact of dumping 13.2 million litres of milk per day are considered a high priority facility, thus load to these factories should not be shed during this time period unless critical.
- A large proportion of our geographic area backs onto the main divide of the Southern Alps with seasonal climate influences causing a large residential load increase for winter heating (typically June-September) of 10-15% of our available load.

The time of day will also be taken into consideration, being that the feeder selection process needs to reflect the loading differential between industrial and residential usage especially with respect to ripple control.

Also the dairy milking activity on our rural feeders needs to be taken into consideration.

Outages will be programmed between 0800 and 1800 on all days.

Timing of outages will be approximate and could vary daily due to either internal network or System Operator constraints.

Night time is excluded from the outage period for safety reasons.

Note that Twizel substation feeders also will off-load Mountain Power embedded network.

4.2 Savings Calculations

Savings calculations have been based on the daily average energy consumption at the time rolling outages would take place (08:00 to 18:00).

Outages shall be of maximum 5 hrs duration (2 per day), with each individual feeder load group only allocated once per day.

Savings calculations have been based upon the 2009 recorded feeder loads.

Feeders have been sorted into prioritised load groups of approximately 5% of total load (average of 5.12 MW).

Over the entire network there are 40 low priority feeders, 16 medium priority feeders, and 18 high priority feeders.

These would be shed on a ½ day cycle with the frequency based on the priority allocated to the feeder load group.

The rolling outage selection table is indicative only.

4.3 Rolling Outages Selection

| <u>Savings Target</u> | <u>Number of feeders impacted per outage</u> | <u>Priority feeders Allocated</u> | <u>Outages per day</u> | <u>Average MW Savings</u> |
|-----------------------|--|-----------------------------------|------------------------|---------------------------|
| 5% | 7 | Low | 2 | 5.12 MW |
| 10% | 14 | Low | 2 | 10.24 MW |
| 15% | 21 | Low | 2 | 15.36 MW |
| 20% | 28 | Low/Medium | 2 | 20.48 MW |
| 25% | 35 | Low/Medium | 2 | 25.6 MW |

The indicative savings plan in this table has been developed for a typical week in the June-September period and may need to be modified when rolling outages are implemented, depending on the time of year. This could involve changing the priority of particular feeders in order to recognise the seasonal variation factors outlined in section 4.1

4.4 Monitoring of Rolling Outage Targets

Alpine will be required to regularly provide information on the level of electricity demand and savings relative to targets to the Electricity Commission:

- A 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. This forecast should take into account the impact of any rolling outages.
- Any expected variation of more than $\pm 20\%$ shall be advised to the System Operator.
- The level of consumption relative to the target levels.
- The nature and extent of rolling outages.

For load shedding to a weekly target, the SCADA technician and/or Controllers will monitor energy savings against target and, together with the Operations Manager, review future load shedding to increase or decrease the amount of rolling outages to enable the weekly target to be met.

The SCADA technician and/or Controllers will be responsible for daily and weekly reporting of consumption relative to target levels, and for providing the predicted load for the next week on a seven day rolling basis.

Reports shall be forwarded daily to the System Controller; and to the Electricity Commission at regular intervals

5. REVOCATION

5.1 Authorisation to Revoke Participant Outage Plan

After consultation with the Electricity Commission, The Alpine Participant Outage Plan shall be revoked on the authorisation of the Chief Executive Officer - or the Operations Manager in his absence.

5.2 Load Restoration Process

Load disconnected during rolling outages must be restored in conjunction with the System Operator. This is to prevent overloading the transmission network and creating further instability.

The System Operator has requested that restoration of load be limited to 25 MW per 5 minute period or less; as this corresponds to approximately 25% of our total load Alpine has no issues complying with this request - the majority of our feeders are required to be manually operated at the substations.

Alpine will ensure that all feeders are returned to service in a controlled manner to maintain system stability.



