

**Participant Rolling Outage Plan  
For  
Carter Holt Harvey Pulp & Paper Ltd  
Kinleith Mill**

**Participant Rolling Outage Plan**

**7<sup>th</sup> May 2015**

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## Definitions

<b>AUFLS</b>	Automatic Under Frequency Load Shedding
<b>Authority</b>	The Electricity Authority
<b>CHH Kinleith</b>	Carter Holt Harvey Pulp & Paper Ltd – Kinleith Mill
<b>Code</b>	The Electricity Industry Participation Code 2010
<b>developing event</b>	An event that evolves over time, e.g. as the result of a period of unseasonably low inflows to hydro catchments
<b>EMP</b>	The system operators Emergency Management Policy. Current version published 19th December 2011
<b>GXP</b>	Transpower Grid Exit Point at which the Kinleith Mill load is indirectly connected
<b>GEN</b>	Grid Emergency Notice
<b>immediate event</b>	An event that occurs with little or no warning, e.g. as a result of a transmission or major power station failure
<b>PROP</b>	Participant Rolling Outage Plan (this plan)
<b>Regulations</b>	Electricity Governance (Security of Supply) Regulations 2008 and Electricity Governance (Security of Supply) Amendment Regulations 2009
<b>Rolling Outages</b>	Planned electricity disconnections spread over different parts of the electricity system at differing times to avoid prolonged outages at any one location.
<b>Supply shortage declaration</b>	Declaration made by the system operator under Clause 9 sub part 2 of the Code.
<b>System Operator</b>	Operator of the national electricity transmission grid (Transpower)
<b>SOROP</b>	System operator rolling outage plan
<b>Transpower</b>	Transpower New Zealand Limited

**Transmission line**

A high voltage supply line owned and operated by Transpower New Zealand Limited

## **Associated documents**

1. The following documents are relevant to this PROP
  - a) Emergency Management Policy published by the system operator on 18<sup>th</sup> December 2011
  - b) System Operator Rolling Outage Plan - Issued by the Electricity Authority on 30 September 2010
  - c) Powerco Security of Supply Response plan
  - d) Powerco – Kinleith Electricity Network Fault first response (Communication plan)
  - e) CHH Kinleith internal load shedding communication plan
  - f) CHH Kinleith internal load shedding instructions
  - g) For more detail on site generation set up see 'Application for Co-generator status 4th May 2007' provided to the Electricity Commission, and/or more information can be provided on request.

## Purpose of this plan

2. Part 9 of the Electricity Industry Participation Code (the Code) relates to security of supply and includes provisions relating to the system operator rolling outage plan (SOROP) and participant rolling outage plans (PROPs).
3. This plan was written to satisfy the requirements of the Code that relate to PROPs. Clause 9.8 of the Code requires that each PROP must
  - a) be consistent with the system operator rolling outage plan; and
  - b) comply with the requirements specified in the notice sent under clause 9.6(2)(a); and
  - c) specify the actions that the specified participant will take to achieve, or contribute to achieving, reductions in the consumption of electricity (including any target level of reduction of consumption of electricity in accordance with criteria, methodologies, and principles specified in the system operator rolling outage plan) to comply with a direction from the system operator given under clause 9.15.
4. The procedures outlined in this PROP are those that may be taken in response to major generation shortages and/or significant transmission constraints. It should be noted that:
  - a) while Carter Holt Harvey Pulp & Paper Kinleith's (CHH Kinleith) load is not direct connected to the transmission network (Powerco is the connected party), as a "specified participant", CHH Kinleith is required to publish and maintain a PROP;
  - b) scenarios that may lead to the implementation of this PROP include unusually low inflows into hydro-generation facilities, loss of multiple thermal generating stations or multiple transmission failures;

## **Supply shortage declaration**

5. Part 9 Sub part 2 of the Code sets out how supply shortage situations will be managed.
6. Under the provisions of the Code the system operator has powers to direct outages following a supply shortage declaration. As a specified participant CHH Kinleith must comply with any direction given to it following the declaration by the system operator following a supply shortage declaration.
7. A supply shortage declaration may apply to:
  - a) All of New Zealand; or
  - b) Regions specified in the declaration
8. When a supply security declaration is made CHH Kinleith must comply with a direction given by the System Operator in accordance with this PROP.
9. The System Operator may, at any time in the period during which a supply shortage declaration is in force, direct CHH Kinleith to contribute to achieving reductions in the consumption of electricity by implementing outages or taking any other action specified in the direction.
10. A direction may be communicated through the information system operated by the System Operator.
11. The System Operator will notify CHH Kinleith when a supply shortage declaration has been revoked
12. This PROP sets out the actions that CHH Kinleith will take, who is responsible for implementing the actions and how communications will be managed between CHH Kinleith and the System Operator.

## Background

### The Electricity Authority

13. The Electricity Authority (Authority) is an independent Crown entity responsible for regulating the New Zealand electricity market. The Authority's objective is to promote competition in, reliable supply by, and the efficient operation of, the electricity industry for the long-term benefit of consumers.
14. The core functions of the Authority are to:
  - a) make and administer the Electricity Industry Participation Code 2010 (Code) governing the New Zealand electricity market;
  - b) undertake market-facilitation measures (such as providing education, guidelines, information, and model arrangements) and monitor the operation and effectiveness of market-facilitation measures;
  - c) monitor and enforce compliance with the Code, various regulations, and the Act;
  - d) proactively monitor the performance of the electricity industry in regard to competition, reliable supply and efficient operation; and
  - e) contract service providers to operate the New Zealand electricity system and market in accordance with the Code

### Transpower

15. 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 and directly (grid) connected major electricity consumers.

### System operator

16. As System Operator, Transpower manages the real-time operation of New Zealand's electricity transmission system by matching supply (generation dispatch) with demand.

### Carter Holt Harvey Pulp & Paper - Kinleith

17. Carter Holt Harvey's Pulp and Paper mill at Kinleith produces packaging paper for local and export markets and bleached Kraft pulp for the export market. Production is approximately 600,000 Tonnes per annum with at least 75% of this volume exported.
18. The plant comprises of two major production lines; packaging paper and bleached kraft pulp lines along with associated steam raising, auxiliary and electricity generation plant.
19. The mill has an average electricity usage of approximately 72 MW of which approximately 34 MW or 45% is generated on site.
20. The mill is a continuous 24/7 operation characterised generally by a high process inertia. The plant takes a significant amount of time to shut down and start up in a safe, environmentally responsible and controlled fashion.
21. Crucial control systems have UPS's and some parts of the plant have their own diesel powered generator or diesel powered drive to ensure plant and personnel safety in the event of a power outage e.g. Kiln rotational drives,

diesel generator for crucial safety functions in the chemical plant, diesel generator for turbine/generator lubrication.

22. There are some other parts of the plant which cannot tolerate an electricity outage of more than approximately 2 hours (clarifiers) without significant and time consuming clean up taking in the order of 3-5 days.
23. The amount of generation from our on-site non-condensing steam turbine generator is fully dependant on the plant steam load which in turn is fully dependant on plant operation. The impact of this is that any reduction in electrical load reduces plant operation and steam production and therefore generation. The result is that reducing electrical load significantly will reduce net load import by a lesser proportion. In some cases it will be as low as 10-30% of the total load reduction being realised as a net reduction in import power. Therefore management of load shedding needs to be carefully managed as crudely taking out one block of plant will often shut down an entire Fibreline within a few hours at huge cost for a relatively small reduction in net load.



## Security of supply events covered by this plan

24. In its Emergency Management Policy the System Operator provides the steps that the system operator will take and the circumstances that will need to exist for a supply security declaration to be made. Those steps provide for a series of last resort emergency measures, which would not be implemented unless there was a significant risk that it would not be possible to meet the demand for electricity on a sustained basis.
25. The types of event likely to require the implementation of the EMP include an extended period of extremely low inflows to hydro catchments, a major asset outage that was expected to be sustained for a long period, or some combination of these events.
26. The EMP describes two categories of events that could lead the system operator to make a supply shortage declaration these are:
  - **Developing Event** – Events that evolve over time – for example as the result of a period of unseasonably low inflows to hydro catchments; and
  - **Immediate Events** –. Events that occur with little or no warning – for example as a result of a transmission or major power station failure, the impact of which are expected to extend over a period of weeks rather than days.
27. Rolling outages under a supply shortage declaration are a last resort measure the system operator may initiate, after consultation with the Authority, only if there is a shortage of electricity supply (generation) or transmission capacity if the system operator considers:
  - a) that the normal operation of the wholesale market is, or will soon be, unlikely to facilitate the adjustment of supply and demand necessary to ensure that supply matches demand; and
  - b) that, if planned outages are not implemented, unplanned outages are more likely than not.

## Full information & partial information PROPS

28. The System Operator Rolling Outage Plan sets out the following requirements for direct connect PROPs.

**Full information plans:** *These plans must contain sufficient information for the system operator to make a decision on the most appropriate savings target for the direct-connect user.*

*A direct-connect user's full information plan must inform the system operator about:*

- *the nature of the load on site;*
- *whether any load is used to provide other services to the electricity sector such as interruptible load;*
- *the extent to which different levels of savings can be achieved;*

- the nature of the measures that could be implemented; and
- the cost associated with different levels of savings.

**Partial information plans:** These plans may contain some of the information required for full information plans. If the system operator sets a savings target for a region where there is a direct-connect user with a partial information plan, their savings target will likely be set to achieve the same percentage saving as distribution companies in that region.

## What this PROP contains

29. This PROP includes procedures for managing both developing and immediate category of event.

Section	Content
<b>Communications</b>	Contact details for communications during a supply shortage declaration
<b>Description of Load</b>	A description of the CHH Kinleith load
<b>Site response</b>	How the site will respond to different types of event including a plan of possible savings
<b>Coordination with the system operator</b>	Sets out how CHH Kinleith and its agent Powerco will coordinate with the system operator
<b>Monitoring and reporting</b>	How CHH Kinleith will monitor and report savings made

30. This PROP contains all the information required for Full Information Plan other than costs associated with different levels of savings. CHH intends to provide these costs immediately prior to or at the time a declaration are made.

## Communications

31. CHH Kinleith will communicate with the system operator for administration and reporting against targets using the following details:

System Operator

Transpower

Level 7

Transpower House

96 The Terrace

PO Box 1021

Wellington

Telephone: 64 4 495 7000

Fax: 64 4 495 7100

32. CHH Kinleith will communicate with the system operator for operational communications via Powerco, our distributor. using the following details:

24 hour response:

Powerco Network Operating Centre (NOC)

Telephone: +64 6 769 5200

Powerco Ltd

2<sup>nd</sup> Floor Council Building

84 Liadert Street

Private Bag 2061

New Plymouth 4342

Telephone: +64 6 759 6200

Facsimile: +64 6 759 6287

Powerco Key Account Manager:

Telephone: +64 6 759 6563

Cellphone: +64 27 235 7938

33. For the purpose of communications under this outage plan CHH can be initially contacted using the following details:

SITE ENERGY COORDINATOR

Phone 07 885 5392 / 0274 416 475

or for 24hr response:

SHIFT MANAGER Steam and Recovery

Phone 07 885 5747 / 0274 416 475

Address

Carter Holt Harvey Pulp & Paper Limited

Kinleith Mill

State Highway 1

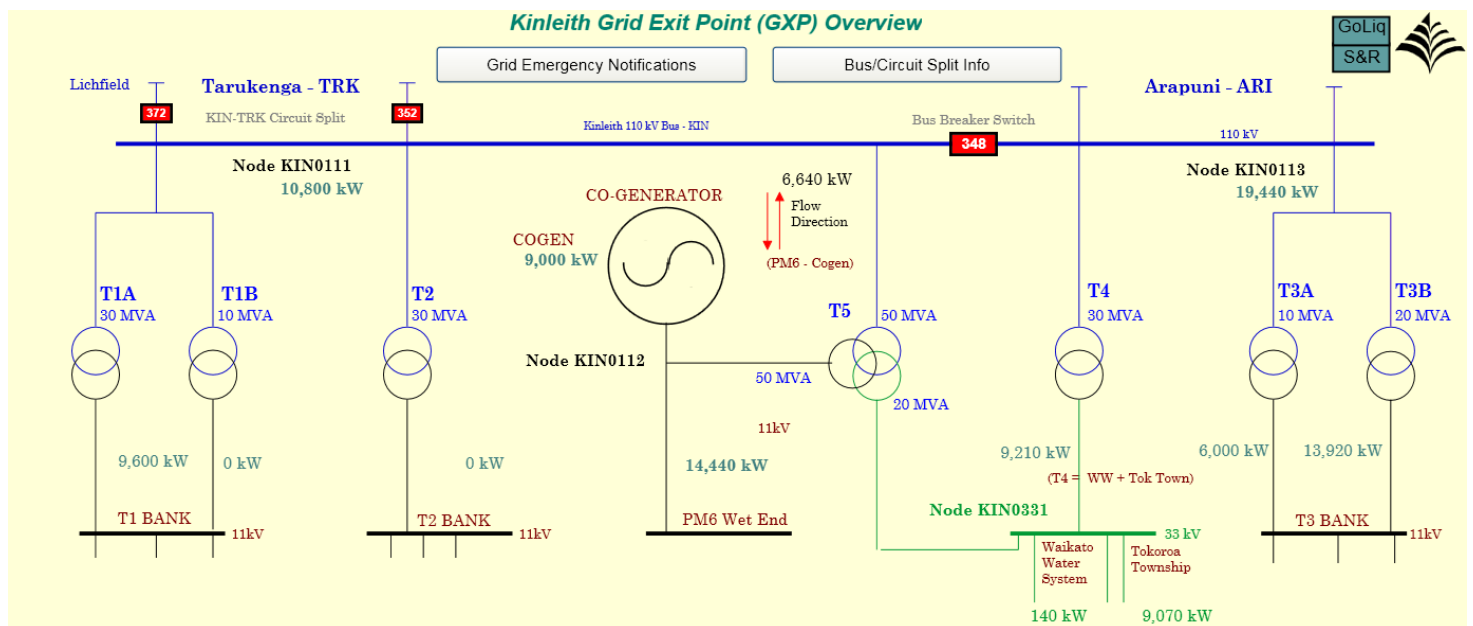
Private Bag 6

Tokoroa

See the CHH Kinleith Internal Site Load Shedding Communication Plan for more details.

## Description of site load

34. The CHH Kinleith site is an integrated mill with two fibre-lines, one for bleached kraft pulp (2FL) and one for containerboard (1FL). While these are separate production lines that can operate without the other, many interconnections occur between processes in addition to power primarily air, water, steam, chemical recovery.
35. Site generation consists of an Allen Steam Turbines Ltd non-condensing type installed in 1998. It acts as a reducing station to control the pressure of the steam to make it suitable for process use throughout the mill; electricity is a by-product. As such it is tightly coupled to the industrial process; hence the status of any plant that is a user of steam affects its output.
36. Generation typical averages around 34 MW. The generator often must go offline if we are reduced down to one high pressure boiler due to reduced steam system stability.
37. While site load is normally between 70-74 MW, peaking at 82 MW. Average is 72 MW. In terms of net Kinleith use the import is normally 37-43 MW, averaging around 38 MW under normal controlled conditions.
38. GXP Configuration. Main load (40- 45 MW T1-T2) fed from KIN0111, and (14 – 18 MW from T3) KIN0113, the Generator feeds into and wet end of PM6 (12-18 MW) fed from KIN0112. Minor user (water system, 0 - 3 MW)



fed off KIN0331.

39. At standby CHH Kinleith uses 6.7 to 9.5 MW of power; the lower value is dependent on Industrial Park consumers shutting down fully.

## How the site will respond to different types of event

### Grid Emergency

40. For events that require an immediate or urgent response, i.e. grid emergency, Powerco will manage the CHH Kinleith response and take action as detailed in their plan. Responses to grid emergency events are **not** covered by this outage plan.

### Immediate and developing Security of Supply Events

41. For responding to immediate or developing security of supply events, there are 4 levels with Block 1 having 3 sub blocks. Total potential for Block 1 is 4.4 - 5.7MW
- a) Rolling cuts of Block 1 (3.4 MW) could take place with some disruption to normal plant operation.
  - b) Additionally a further 0.3 MW (*Block 1a*) of the industrial park may be able to be shed, but requires discussion with a 3<sup>rd</sup> party at the time of the request.
  - c) Increasing generation by venting steam 1-2MW depending on mill conditions (*Block 1b*)
  - d) Any further cuts (*Blocks 2, 3 and 4*), require the major shutdown of one or both of the production lines effectively stopping production on either or both the lines. This plant could not be safely and economically shutdown and started up on a rolling basis.
  - e) Block 4a is the total shut down of the Industrial Park consumers and movement to a standby load to keep critical environmental and safety equipment running.

Note: Blocks 1a and 4a require discussions with other parties that are power users in the greater industrial park area. At this time we cannot state what load shedding they will do.

42. Load blocks relate to 38 MW average import load.

### Block 1 – 3.4 MW (Rolling cut capable)

Plant that is currently shed on power and RCPD constraints. Doesn't usually have to run 24/7 so is normally available for short term load shedding.

Note: the 3.4 MW is a normal maximum sheddable, as the plant may be already down when load shedding is required or in some cases needs to run depending on the mill situation.

### Block 1a – 0.3 MW (Rolling cut capable)

Pedersen's Euc chipper.

**Block 1 b – venting steam to maximise generation** 1- 2 MW. (cost is approximately \$500/MWh for additional gas burnt to generate the required amount of additional steam)

### Block 2 –10.7 MW

This is total shut down of No.1 Fibreline, which includes the Paper Machine, No.1 Pulpmill, No.3 CD, Parts of Chemical Recovery, Causticising and Kilns, Wood Prep. As well as a reduction in some utility use.

### **Block 3 – 5.8 MW**

Shut down of Chemical Plant and Bleach Plant, No.2 FL switches to Unbleached Pulp manufacture but keeps steam producing and turbine plant online.

### **Block 4 – 8.6 MW**

Total Mill shut down with the exception of critical standby equipment to prevent safety, environmental incidents and plant damage. Industrial park not yet shut.

### **Block 4a – 2.6 MW (Potentially rolling cut capable)**

Full Industrial Park shut, specifically complete shutdown of the Plywood and Roundwood Mill operations.

Total Possible = 31.3 MW reduction in import (82%).

Attached is Appendix 1 which is a profile of a controlled load shed from full mill operation to full shutdown over a 24hr period.

The mill can be shut quicker if 2, 3, 4 load blocks happen concurrently.

43. Any action contemplated for the developing event scenario, in particular scenario 39(d) and (e) above, would need careful consideration of our customer needs, production plans and overall electricity supply situation with respect to likely duration of the emergency. Any action taken under 39(d) and (e) would have an immediate and major impact on our business both in terms of costs and impact on our ability to supply both local and export customers.
44. Responses to past mainly short term events have included
  - a) Shutting Block 1 for periods
  - b) Increasing MVARs on our generator, normal set point 2 MVAR.
  - c) Increasing MW by a small amount, 1- 2 MW on our generator by venting steam at low pressure header.

### **Indicative savings plan**

45. Indicative plans for various levels of savings are provided in the table below.

Participant Rolling Outage Plan

Options	Expected net site demand (MW)	Expected site pre savings weekly energy (MWh)	Option load (MW)	Targeted weekly savings (MWh)	Expected weekly savings (%)		
Block 1 Increasing generation by venting steam (depends on mill conditions)	38	6384	1.50	255	4.0%		
Block 2 Shut down of No.1 Fibreline, which includes the Paper Machine, No.1 Pulpmill, No.3 CD, Parts of Chemical Recovery, Causticising and Kilns, Wood Prep. As well as a reduction in some utility use.			12.40	638	10.0%		
				958	15.0%		
Block 3 Shut down of Chemical Plant and Bleach Plant, No.2 FL switches to Unbleached Pulp manufacture but keeps steam producing and turbine plant online.			5.80	638	10.0%		
				958	15.0%		
				1277	20.0%		
Block 4 Total Mill shut down with the exception of critical standby equipment to prevent safety, environmental incidents and plant damage. Industrial park not yet shut.					30.70	1596	25.0%
Block 4a Full Industrial Park shut, specifically complete shutdown of the Plywood and Roundwood Mill operations.					2.60	319	5.0%
Block 4 plus 4a Full Industrial Park shut, specifically complete shutdown of the Plywood and Roundwood Mill operations.			33.30	1596	25.0%		



46. It is important to note that the above figures are based on assumptions made for a number of variable production levels and components. The load profiles are based on a staged shut down of the whole mill loadings to provide guidance as to the longer term achievable savings.
47. The MW figures and indicative savings and restoration losses above depend on the production conditions of the various plants at the time the request to reduce load is given.
48. Whilst the indicative savings levels are suitable for the system operator to use when determining the level of savings available at the CHH Kinleith site, it is likely to be appropriate to update them if a supply shortage is declared.

**Indicative cost of savings**

49. The costs incurred by CHH Kinleith for implementing the various levels of savings described in this PROP will be dependent on the timing, duration and frequency of the required load reductions. External factors such as pulp market conditions will be very relevant to the costs incurred due to implementing the savings plan.
50. Under developing events CHH may be in a position to provide the system operator with indicative estimates of the cost of savings if this information would be useful to the system operator in allocating savings between participants. Under immediate events cost information may not be available.

## **Coordination with the System Operator**

51. It is expected that the System Operator will, for savings planning purposes, communicate directly with CHH Kinleith Site Energy Coordinator (see paragraph 33)
52. As Powerco have a communications link with the System Operator it is intended that for operational issues the system operator will approach Powerco who will liaise with CHH Kinleith to determine best approach for the operational management of the saving plan, the subsequent plan that is to be actioned will then be communicated back to the system operator through Powerco.
53. It should be noted that grid emergencies are to be managed as per the Powerco POP and CHH Kinleith internal load shedding plan.
54. There are no AUFLS requirements for CHH Kinleith.
55. When the termination of a savings declaration is notified to CHH Kinleith the load restoration plan will be developed by CHH Kinleith and Powerco. Restoration is to be coordinated through primarily Powerco to the CHH Steam and Recovery Shift Manager. Powerco will coordinate the operational management of restoration with the System Operator.
56. Throughout the savings and restoration periods wholesale electricity market bids/offers updates will be made through normal channels by CHH Kinleith agents TrustPower and Mighty River Power.

## **Monitoring and reporting**

57. CHH Kinleith will utilise Capstone (Mill information system, sourced from site DCS (distributed control system) and some from SCADA) data to determine savings from previously projected usage.
58. Discussions will occur between relevant parties from System Operator, and Powerco and CHH Kinleith as per CHH Kinleith Internal Communication Plan if adjustments to the plan need to be considered.
59. Reporting to the System Operator for operational monitoring purposes will be undertaken on a weekly basis or more frequently if requested.
60. Reporting to the System Operator will be undertaken at intervals as required by System Operator.

**APPENDIX 1: ESTIMATED TOTAL MILL SHUT LOAD PROFILE.**

