Attachment B

Report for the Minister of Energy into the Operation of the New Zealand Electricity Power System on Monday 19th June 2006

TRANSPOWER

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David Gascoigne
Chairman
Tel: 04 495 6971
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28 June 2006

Hon David Parker
Minister of Energy
Executive Wing
Parliament Buildings
WELLINGTON

Dear Minister

Operation of the Power System on 19 June 2006

Thank you for your letter of 22 June 2006. The information you have requested is set out in summary in this covering letter and in detail in the attached report. I have some preliminary comments that I believe provide an appropriate context for that information.

It is important to understand the different roles that various sectors of the electricity industry play in the delivery of electricity to consumers. I believe you are already well aware of the regulatory issues that impact the planning (especially longer term planning) of electricity transmission at a national level. Planning for the national grid is only one part of ensuring adequacy of supply to any region. The availability of generation, local distribution and the manner in which market participants offer generation, distribution and load control (water heating on ripple control) assets and transmission assets into the market all materially influence the security of supply to consumers.

Therefore, to the extent Transpower is called on to comment on or provide assurance about continued security of supply its response is necessarily limited to what it knows of other parties actions and to what it can do in its functions as asset owner of the national grid and as the system operator service provider to the industry. As grid owner and operator Transpower's planning functions are regulated by the Electricity Commission. Its System Operator functions are provided under a service contract to the Electricity Commission. Both Grid Owner and System Operator activities are subject to revenue and price regulation by the Commerce Commission.

The nature of Transpower's central roles in the industry does provide it with something of a bird's eye view of the industry as a whole. It uses this position to provide advice and commentary to the industry, in a number of ways. It undertakes a variety of work for the Electricity Commission, is active in the Electricity Commission Advisory Groups and produces a number of publications (referred to in the attached

report) that are available to the industry and the public. In these publications Transpower provides its view of nationally important power system issues, only some of which fall within Transpower's responsibility to manage. To the extent the issues identified are outside Transpower's responsibility, they need to be managed by other industry players, including generators, retailers, distribution companies, consumers and the Electricity Commission.

The attached report covers the significant Electricity Power System events on Monday 19th June 2006. Specifically the report covers:

- The loss of supply at Rotorua caused by human error during maintenance
- The shedding of electricity to approximately 6000 households in the Bay of Plenty due to high loads (caused by severe weather conditions) that exceeded the transmission and generation capacity in the region and the inability of normal load control via water heating to reduce loads to safe levels.
- The national supply and demand situation on the Monday evening, when insufficient generation had been offered to the System Operator to meet the expected demands over the evening peaks, despite repeated notices to the industry over the previous 24 hours. This situation resulted in a national grid emergency and the conversion of generation reserves, normally used to cover equipment failures, to being used for immediate generation.
- A summary of material security issues in the New Zealand Electricity Power System, where investment is required in the short term to ensure adequate supply margins. The investment areas included in the Report's Appendix are selected from Transpower's publications, the System Security Forecast and the Annual Planning Report. More detail on each of the identified material security issues is available in these reports. There are a large number of other, less significant matters included in the System Security Forecast and the Annual Planning Report which, for clarity reasons, are not included.

The climatic conditions of the last two weeks – snow, cold weather and high winds – resulted in events and consumer demands that were very challenging for the operation of the power system. The Report provides information that the power system is currently capable of meeting reasonable consumer demands, although the margins in certain regional areas are slim. Transpower has plans for the reinforcement of the supply capability in these areas, and these plans are detailed in the Report.

However, as you are aware, Transpower has substantial concerns that the current regulatory process does seem to impede the making of timely and appropriate decisions to ensure the future capability of the Power System to meet the needs of New Zealand's consumers.

A briefing on the information in the Report can be made available to you and your staff, if this would be helpful.

Yours sincerely

David Gascoigne

David Gascoigne
Chairman

Report for the Minister of Energy into the Operation of the New Zealand Electricity Power System on Monday 19th June, 2006

This report has been prepared in response to a request by the Minister of Energy, the Hon David Parker, for an explanation of the power system events of Monday 19th June, 2006. A copy of the Minister's letter is attached as Appendix A.

1. Supply-demand margin and scheduling supply resources:

Set out below is a summary of the events of June 19th as Transpower currently understands them. Further investigation work is underway, as also noted. Our review to date has focused primarily on operational management of the power system. It is clear to Transpower, however, that in the national energy shortage situation (on the evening of the 19th) the behaviour of market participants was a materially influencing factor in the situation.

General context: the events of the last two weeks

The climatic conditions of the last two weeks – snow, cold weather and high winds – resulted in events that were very challenging for the operation of the power system. On Monday 12 June three coincident, major system events occurred at the same time:

- outages in the South Island were able to be managed to ensure key load areas such as Christchurch and Nelson survived what was a '1 in 10 year' weather event without interruption.
- a major outage in Auckland was being managed.
- North Island gas fired generation was at risk due to an outage of Maui production. Transpower System Operator played a part in the management of that issue.

The week of 19th June saw a continuation of the nationwide cold conditions. The conditions contributed to a generation shortfall on Monday 19th as well as load shedding in Tauranga. Subsequently, the slow moving cold southerly storm continued to test system capability with regional increases in peak demand of up to 7% over 2005. Records were set for demand in a number of key regions and across each island. Despite snow related faults in the three main centres as the storm moved northwards, supply was retained in some particularly badly weather affected areas such as Hawkes Bay and Poverty Bay.

Aside from the unique 12 June Auckland event, supply from the national grid was only interrupted to some consumers in Tauranga (on 19 June) and to some smaller rural supply points in Canterbury (on and after 12 June). The interruption to customers in Rotorua was caused by non-weather related factors.

2. Rotorua substation fault:

At around 09:00 one of two 110 kV circuits to Rotorua was taken out of service for scheduled and planned maintenance. Previous security planning work showed no

substantial risks. At 12:52 the in service 110 kV circuit tripped while preparations where being made to return the out of service circuit, following completion of the maintenance work. About 100 MW of load into Rotorua was lost. The lost load was restored about 50 minutes later.

The event is being internally investigated by Transpower. Our initial review suggests the incident cause was 'human error' and unrelated to the prevailing difficult climatic conditions.

There are no current plans by Transpower to reinforce the transmission capacity into Rotorua, as it is understood the local distribution company Unison has the ability to feed its 11kV Rotorua system with its own distribution system from Transpower's substation at Tarukenga. Transpower intends to follow-up with Unison to determine that this is still their position following the recent event.

3. Tauranga shortage of transmission capacity:

At 13:30 a grid emergency was declared at Te Matai, Tauranga and Mt Maunganui. The grid emergency continued for the period 13:30 until 20.00. The reason was that load in the region was exceeding the power system limit due to extreme weather conditions. Initially load was managed to limits set by Transpower by the local distribution company, Powerco, utilising the control of water heating within its area.

At around 1730 up to 14 MW of load supplied at Te Matai was disconnected by Powerco in response to a Transpower instruction to return to, and maintain, the previously communicated load limit. Transpower understands the distribution company was unable to fully control water heating load in the region using controlled domestic water heating. The disconnection enabled the power system security requirements to be met, albeit at the expense of some consumers being without electricity for a short period. The alternative of not controlling loads below safe load limits, risks cascade failure and the "blacking" larger areas for a single fault.

The grid into the Tauranga region is near capacity. Transpower has plans in place to address the issues. Supply issues into the area have been highlighted for some time, notably during an event in April 2004. Historically, Tauranga consumers (one of New Zealand's fastest growing areas) have relied on local hydro generation provided by the region's former power board to defer the cost of grid upgrades. The current industry structure (especially the split of generation, retail and distribution) together with a change of ownership of the local distribution lines business (now Powerco) made it difficult to agree on needed improvements to grid connections into the Tauranga region.

Agreement has been reached that a line upgrade and new switching substation be put in place over the next two years to secure supply out to 2016. The first of these works are expected to be commissioned for service in December 2007 with other works following from 2008. These works are detailed in Transpower's "Annual Planning Report", and are Electricity Commission "approved committed" projects. Pending completion of the upgrade works a number of operational measures are available that will allow more power to be supplied to the region. These operational measures will increase the risk of small scale blackouts following equipment failures, while preserving the supply to the majority of the region.

4. National generation shortfall – evening of the 19th June:

At 17:34, due to a shortage of offered generation, the System Operator verbally declared a nation wide power system grid emergency, for the period 17:34 to 20:00. All generation offered to the System Operator had been dispatched and system frequency was unable to be maintained due to the level of demand. The System Operator took action to curtail the dispatch of generation reserves, thereby increasing available generators producing energy, but at the cost of lowered system security.

The action to not dispatch reserves is an operating procedure available to the System Operator when a grid emergency has been declared. It allows load shedding to be avoided or delayed. However, without the dispatch of reserves, any routine power system event (such as a tripping off of a large generator) which would normally go unnoticed by consumers will result in automatic load shedding of a proportion of consumers (in the affected island) to ensure the power system does not collapse.

The Whirinaki reserve energy station had started at 17:00 and again just prior to 20:00 when normal dispatch of reserves was resumed. Whirinaki dispatch occurs when the market prices reach its standing offer in the generation stack typically at $1000 (the pricing formula as determined by the Electricity Commission).

There were several asset outages on the 19th of June that affected the capability of the power system to match supply with demand:

- prior to declaration of the grid emergency, the HVDC capacity had been reduced from 1040 MW to 824 MW after a forced (unscheduled /unplanned) outage of HVDC equipment. The outage was initially expected to continue through the evening peak and would have reduced the amount of South Island power able to be transferred to the North Island. However, full HVDC capacity was restored just prior to the grid emergency. During the grid emergency peak HVDC transfer did not exceed 724 MW (below the initially available 824 MW transfer limit). During Grid Emergency, with reserves set to zero, the level of transfer on the HVDC was determined by the generation pricing in the North and South Islands.

- planned maintenance work on transmission lines reduced the maximum available generation from the Waikato River power stations, by 170 MW. The relevant lines could not be brought back to service at short notice. A short notice reduction in capacity (200MW) was advised for Tokaanu station during the event, due to generator intake being temporarily blocked by lake weed.

- New Plymouth power station (capacity of up to 330 MW) was not offered to the System Operator at the time, although it had been operational on Sunday 18th June.

- generation associated with the dairy industry providing both electricity and heat at Te Rapa and Te Awamutu was unavailable due to the normal end of dairy season maintenance outages.

Transpower is investigating the extent to which the evening generation shortfall could have been foreseen and whether the early warning to generators and other participants that was provided was sufficient in the circumstances to have reasonably avoided the need to declare a grid emergency. In particular, the investigation is looking at:

- differences between the forecast of load used in pre-dispatch information provided to generators and the actual load given the colder conditions.

- actual generation offered to the System Operator (through the wholesale market) and the capability of available generators.

- the accuracy of the information presented to the System Operator from which it builds its load forecasts.

This investigation represents substantial ongoing work and will take some time to conclude.

5. Discussion on generation short fall event:

While the events surrounding the generation shortfall event are being further investigated, there are some pertinent observations that can be made now:

- sufficient generation to meet demand was available for the balance of the week. 200 MW was subsequently offered from the New Plymouth generator. The Waikato River stations were able to run at full output from Wednesday evening following completion of the transmission maintenance work. Generally, there appears to have been an increase in offered (and dispatched) generation from most North Island generators after the Monday event. The nature of the change in generation and reserves offered to the System Operator on the 19 June and subsequent days is being considered in the review noted above.

- A new all time record peak of 4441MW was achieved in the North Island at 17:30 on Tuesday 27 June 2006. This was achieved without the need of any special actions such as “System Reserve” or “Grid Emergency” notices. The previous highest peak was 4425MW on 19 June 2006.

- the System Operator provides a database for participants to register and review planned outages of generation and transmission. On Monday only a few generation outages were notified. New Plymouth, and Tokaunu were not notified outages. While plant, such as the New Plymouth generator, may be capable of operating, the System Operator can only dispatch generation that has been offered by its owner through the market. There is no mandated requirement for generators to offer plant. A declaration of grid emergency by the System Operator does not change that position. What it does do is enable new offers to be made without adherence to the normal offer lodgement process (offers must be made two hours ahead of a trading/dispatch period).

- the potential for a generation shortfall to arise had been signalled to the market when the System Operator issued Standby Reserve Notices at 13:36 on Sunday 18th June, and at 03:05 and 14:47 on Monday 19th of June (copies attached in Appendix B together with the National and Bay of Plenty Grid Emergency Notices). A Standby Reserve Notice is issued when there are insufficient generation offers made to the System Operator to meet both expected demand and the reserve requirements (i.e. cover normal power system operation with the loss of the largest generating unit). These notices clearly flagged to market participants the potential for shortages on the day if a generating unit became unavailable. However, conditions on the evening of 19 June were such that, notwithstanding the issue of warning notices (over a day

ahead), there was a shortfall of offered generation and reserve energy, even without the loss of a generating unit.

- a chart is included as Appendix C that shows the actual load curve for Monday 19th June. The half hour in which the peak load occurred, 17:30 to 17:59 is expanded to show the System Operator's load forecasts for the peak period, starting with the first forecast at 13:06 on Sunday 18th June. The first 'Standby Reserve Customer Advice Notice' (CAN) was issued at 13:36 on Sunday 18th June.

  The System Operator forecasts all show predicted loads higher than the peak that actually occurred. This is not unexpected as the Grid Emergency Notice issued at 17:34 on Monday 19th June requested all generators to offer additional generation, and for all participants to reduce load. The outcome shows the majority voluntarily complied, avoiding the need for load shedding to match load to the available generation.

- the offering of generation from slow starting thermal plant in the New Zealand market presents difficulties for the owners of such plant. The plant may get dispatched at short notice yet require up to six hours to reach the set point to which they have been dispatched by the System Operator. In other markets where slow starting plant (e.g. coal, nuclear) dominates the generation mix, this 'unit commitment' problem is approached by country unique market designs, quite different from that existing in New Zealand

- an event similar to that on 19 July occurred on June 29th 2004. In that event a sudden winter peak caught market participants and the System Operator by surprise. A Grid Emergency Notice was issued at short notice. At that time a major Combined Cycle Gas Turbine generator was available for service but had not been offered, apparently due to prevailing low spot prices. In the days subsequent to the event additional generation was offered and the security issues were resolved.

6. Transpower's view on scheduling supply resources:

Transpower is not in a position to express an opinion on the level of confidence that "supply resources are able to be scheduled to ensure adequate margins during the remainder of the winter". Transpower as System Operator runs the power system and the associated market systems. It does not offer nor can it control the offer of generation and reserve energy. It also cannot control, nor is it advised of the level of water heating control. The attached press report regarding WEL Networks in Hamilton (Appendix D) indicates the difficulties faced by Transpower System Operator in a non-transparent voluntary market like New Zealand's with water heating control as the major demand side intervention for managing peak demand. The System Operator can call for additional generation, reserve energy and load control if needed (and uses Grid Emergency Notices to signal these requirements). While there are transmission influences in the security of supply equation, the events of the evening of the 19th June demonstrate that the availability of generation (energy and reserve energy) and the somewhat unpredictable demand behaviour of the use of water heating control, are equally critical elements in meeting consumers expectations.

7. Managing identified national supply risks:

No new national or material regional supply risks have been identified from the events on Monday 19th, 2006, that are not recorded in Transpower's publications.

The supply issues into Tauranga have been identified. Similarly the situation where there is a national shortage of offered generation has been experienced previously (as noted above).

Transpower produces two important publications that focus on power system issues, principally related to transmission and power system operation. These are:

- System Security Forecast (SSF)

  SSF is produced by Transpower as System Operator every two years and updated every six months. This document is a requirement of the Electricity Governance Rules (EGRs). It requires the System Operator to forecast its ability to meet its Principle Performance Obligations. Necessarily the forecast considers the transmission and power system issues that affect the System Operator's role. Accordingly the SSF has identified a number of security of supply issues, including those affecting the Tauranga region and the need for generation to match demand forecasts. The first SSF was published in December 2004.

- Annual Planning Report (APR)

  The role of the APR is to signal proposed and possible transmission investments within a ten year horizon, so that those proposing transmission alternatives have a greater degree of information about Transpower's plans.

  The APR is not a regulatory requirement. The APR draws on earlier publications (like the Future of the National Grid and System Security Forecast) to provide a comprehensive 10-year forecast of this issues impacting on the National Grid and Transpower's plans and possible future paths for development.

  The 2006 APR provides information about:

  - the existing National Grid.
  - demand and generation forecasts for the next 10 years, using information from the Electricity Commission's Statement of Opportunities (SOO).
  - the National Grid investment that may be require to meet future needs for the next 10 years and beyond by way of:
    - regional plans or the 13 regions making up Transpower's transmission network, and
    - grid backbone transmission plans for the main North and South island transmission corridors, and for the HVDC link.

The APR also includes all the requirements of a Grid Reliability Report (GRP), as required by the EGRs.

Both these publications have been made available to industry participants (and the public via industry web sties), including the Electricity Commission and the Ministry of Economic Development. The matters raised are, in Transpower's view, ones of public record and well known within the electricity industry. Appendix F is a summary of the material security issues identified in the two publications. There are a substantial number of other, less significant matters included in both documents which for clarity reasons are not included.

Transpower also produces a number of reports (required under the EGRs) that detail grid reliability issues and grid upgrade requirements. These are the grid upgrade plans and grid reliability reports required in Part F of the EGRs. Transpower's grid capital expenditure programme is subject to an approval process managed by the Electricity Commission. Each document produced and approval sought under these Part F processes is publicly available or notified. There is substantial opportunity for industry and public contribution.

8. Other supply risk regions and actions to address those risks:

To the extent the SSF and the APR both identify security of supply issues, they are at the same time identifying where grid investments should be made (and in many cases have been committed to be undertaken or are in planning). Apart from the well known issues concerning Transpower's proposed grid upgrade plans into the Auckland region, the issues highlighted in the SSF and the APR which are Transpower's responsibility are being addressed either:

- in its committed work plans – those which have received approval from the Electricity Commission and which have advanced to contract and construction stages.

- in its planning work - those which are being planned and which still require Electricity Commission approval.

The timetable for completion of many works is quite long. Consequently the identified risks intended to be addressed by the works will remain until the works can be carried out.

Of particular note at present is the completion of the wiring of the second circuit from Stoke to Blenheim in the Upper South Island. The completion of this work has been delayed by landowner issues, which are now compounded by poor ground conditions caused by the weather. Temporary operational measures (automatic under voltage load shedding relays) are in place, which are expected to be adequate if the line cannot be completed before the end of winter.

The summary in Appendix F identifies the material 'at risk' transmission assets (and therefore the 'at risk' areas supplied by those assets) and also includes the programmed works.

The summary table is taken from Transpower's SSF and its APR documents. The sectional references for the relevant issue from the respective documents are included in Appendix F, along with all relevant details. Of particular note is the status of the

projects, both within Transpower and the Electricity Commission, the likely project timing and costs.

In its role as System Operator, Transpower understands the security issues the offered assets present and manages these on a daily basis in conjunction, where necessary, with relevant generators/retailers and distribution companies. In managing regional Power System security of supply issues, the System Operator has for several years used Regional Security Forums open to all relevant stakeholders. Currently there are three Forums operating:

- Upper North Island, covering the power system from Huntly to Northland, including Auckland.
- Upper South Island, covering the power system from the Waitaki river to Nelson/Marlborough.
- the Top of the South Island, covering Nelson and Marlborough.

For both the summer and winter periods the Forums (usually about 20 stakeholders) work together to develop contingency plans for the relevant area.

The details of these forums, including meeting minutes, presentations and contingency plans are available on Transpower's website: www.transpower.co.nz/so.

Transpower wrote to the Minister, Hon Trevor Mallard, on 13 April 2006 to advise him of the plans and actions that had been put in place by the Regional Forums and projects undertaken by Transpower to provide for Power System Security for Winter 2006. This letter is attached as Appendix E.

9. Other relevant matters:

Transpower, in its role as owner and operator of the National Grid and Transpower as the System Operator to the industry, believes it has complied fully with the Electricity Governance Rules and Regulations for all the operations leading up to and including Monday 19th June 2006. Transpower's internal compliance reviews have not identified any notifiable breaches. To date, no other industry participant has alleged a breach against Transpower.

APPENDIX A

22-JUN-06 06:00PM FROM-HON DAVID PARKER +6444723617 T-438 P 01/02 F-100

Office of Hon David Parker
Minister of Energy
Minister Responsible for Climate Change
Minister for Land Information

File No: POL/1/11/2

22 JUN 2006

David Gascoigne
Chairman
Transpower New Zealand Limited
PO Box 1021
WELLINGTON

Dear David

OPERATION OF THE POWER SYSTEM ON 19 JUNE 2006

I am concerned that the power system was barely adequate to meet the demand for power on Monday 19 June, and that a nation-wide grid emergency notice had to be issued to market participants. I am also concerned that power supplies were interrupted to some consumers in Rotorua and the western Bay of Plenty that day.

I am asking Transpower to provide me, by Wednesday 28 June 2006, a written report explaining the power system events of last Monday, including:

- why the supply-demand margin was so tight on Monday, and whether Transpower is confident that supply resources are able to be scheduled to ensure adequate margins during the remainder of this winter;
- what actions Transpower is taking to manage the national supply security risks identified on Monday;
- what other parts of the national grid are exposed to the supply security risks identified in the western Bay of Plenty, and what actions Transpower is taking, both short term and long term, to mitigate those risks; and
- any other matters relevant to my concerns.

Parliament Buildings, Wellington, New Zealand. Telephone: 64 4 470 6559 Facsimile: 64 4 472 3617
Email: dparker@ministers.govt.nz, Website: www.beehive.govt.nz

TRANSPOWER

I am particularly concerned to ensure that any learnings from the events of Monday are rapidly applied so that ongoing risks to security of supply are minimised.

Yours sincerely

David Parker
MINISTER OF ENERGY

cc: Minister of Finance
Minister of State-Owned Enterprises
Chair of the Electricity Commission

588167

APPENDIX B

TRANSPOWER

Telephone : 0800 488 500
Facsimile : 07 843 7176

To: CAN Energy Traders

Date: 18 Jun 2006, 13:36

From: System Operator

Standby Reserve (CAN) for Insufficient dispatch proposals on 19-Jun-2006 from 17:30 to 18:30

The System Operator advises participants that there are insufficient standby reserves available for the following trading periods:

Following a contingent event:
- There may be insufficient generation reserve available for the System Operator to re-dispatch the system to a secure state (i.e. manage a subsequent contingent event).
- Demand management may be required

Market Day	Time	Period	North Island	South Island	New Zealand
19-Jun-2006	17:30	36	63.606		5.757
19-Jun-2006	18:00	37	96.723		29.044
19-Jun-2006	18:30	38	50.636		

This situation can be alleviated by participants revising their demand and generation offers for those trading periods.
A revision of this notice will be issued if there is any change to the situation advised above.

TRANSPOWER

Telephone : 0800 488 500
Facsimile : 07 843 7176

To: CAN Energy Traders

Date: 19 Jun 2006, 03:05

From: System Operator

Standby Reserve (CAN) for Insufficient dispatch proposals on 19-Jun-2006

The System Operator advises participants that there are insufficient standby reserves available for the following trading periods:

Following a contingent event:
- There may be insufficient generation reserve available for the System Operator to re-dispatch the system to a secure state (i.e. manage a subsequent contingent event).
- Demand management may be required

Market Day	Time	Period	North Island	South Island	New Zealand
19-Jun-2006	17:30	36	68.472		22.394
19-Jun-2006	18:00	37	65.449		

This situation can be alleviated by participants revising their demand and generation offers for those trading periods.
A revision of this notice will be issued if there is any change to the situation advised above.

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TRANSPOWER

Telephone : 0800 488 500
Facsimile : 07 843 7176

To: CAN Energy Traders

Date: 19 Jun 2006, 14:47

From: System Operator

Standby Reserve (CAN) for Insufficient dispatch proposals on 19-Jun-2006 from 07:30 to 18:00

The System Operator advises participants that there are insufficient standby reserves available for the following trading periods:

Following a contingent event:
- There may be insufficient generation reserve available for the System Operator to re-dispatch the system to a secure state (i.e. manage a subsequent contingent event).
- Demand management may be required

Market Day	Time	Period	North Island	South Island	New Zealand
19-Jun-2006	17:30	36	67.855		40.381
19-Jun-2006	18:00	37	85.961		44.092

This situation can be alleviated by participants revising their demand and generation offers for those trading periods.
A revision of this notice will be issued if there is any change to the situation advised above.

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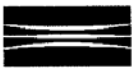

TRANSPOWER

Telephone : 0800 488 500
Facsimile : 07 843 7176

To: GEN NI Local, Powerco Ltd (Fax), Trust Power

Date: 19 Jun 2006, 14:02

From: System Operator

Grid Emergency on 19-Jun-2006 from 13:30 to 21:00

The System Operator advises that there is unplanned outage at Mount Maunganui, Tarukenga and Te Matai.

Participants at Mount Maunganui, Tarukenga and Te Matai are requested to:

- decrease demand
- increase generation offers

Where participant response is insufficient, the System Operator may manage demand to alleviate the grid emergency

A revision of this notice will be issued if there is any change to the situation advised above.

This formal notice is issued in accordance with the EGR's - Part C Section C3 Technical Code B - Emergencies

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TRANSPOWER

TRANSPOWER

Telephone : 0800 488 500
Facsimile : 07 843 7176

To: GEN NZ Participants

Date: 19 Jun 2006, 17:44

From: System Operator

Grid Emergency on 19-Jun-2006 from 17:34 to 20:00

The is a New Zealand wide emergency. There is Insufficient Generation offer to meet demand.

Participants are requested to:

- decrease demand
- increase generation offers

Where participant response is insufficient, the System Operator may manage demand to alleviate the grid emergency

A revision of this notice will be issued if there is any change to the situation advised above.

This formal notice is issued in accordance with the EGR's - Part C Section C3 Technical Code B - Emergencies

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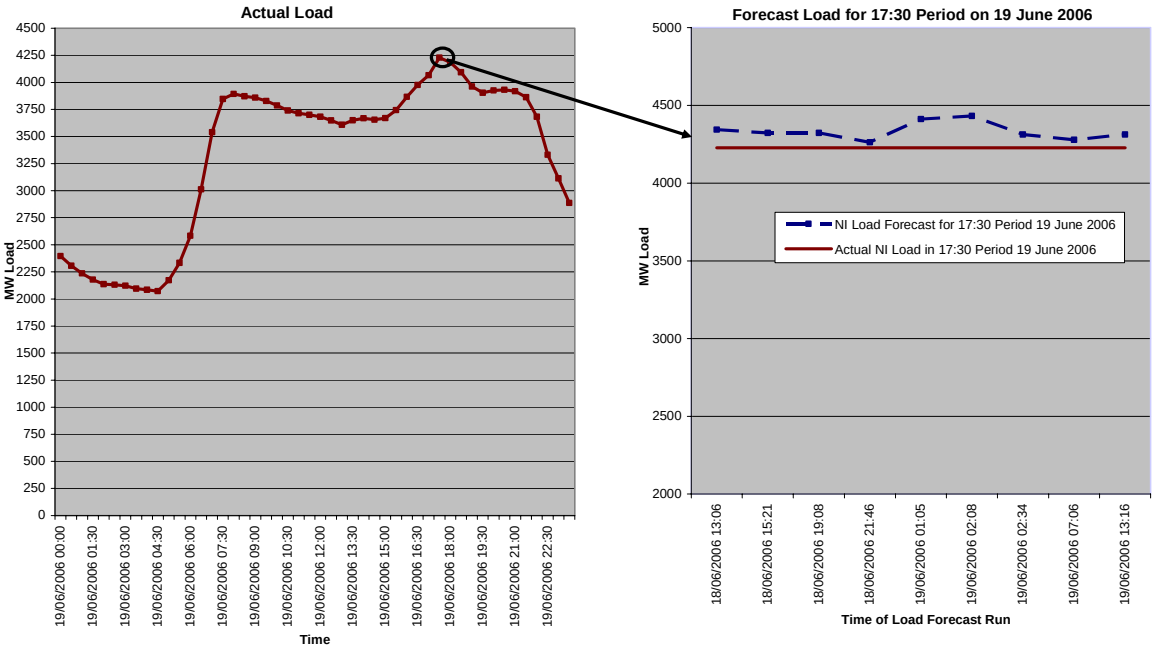
APPENDIX C

North Island Load on 19 June 2006



APPENDIX D

Waikato Times
As Waikato As It Gets
www.waikatotimes.co.nz

Power trade-off hits company in pocket

WEDNESDAY, 21 JUNE 2006

By GEOFF TAYLOR

A decision to maintain full power to Waikato households on Monday during a national power shortage cost Wel Networks about $1 million, according to chief executive Mike Underhill.

Rather than cut back consumers' water heating for a long period, the lines company opted to lift its target peak usage, despite Transpower warnings to cut usage.

Lines companies regularly cut hot water heating in winter through "ripple control" to shave the top off peak demand. Record low temperatures this week saw record power use nationally and a red alert from Transpower early on Monday evening, warning there was not enough power to meet forecast demand.

It asked power plants to increase production around the country and lines companies to reduce demand.

Mr Underhill said that just after midday on Monday, Wel Networks realised it would struggle to turn people's hot water back on so made the decision to lift its usage targets, despite the generation concerns.

"We decided that people needed to have hot water. It was a trade-off between no hot water and resetting those targets. We are community owned so the question was, at what point do we make a trade-off?"

Mr Underhill said Waikato's power usage was up a massive 13 per cent on the corresponding day last year.

Lines companies around the country reacted in different ways to Transpower's warnings to cut power. Powerco blacked out 6000 households in the Bay of Plenty at dinner time. In Auckland, lines company Vector turned off all hot-water heating in the region for six hours from 5pm.

Transpower communications manager Chris Roberts said power use reached a national record 6630MW on Monday between 5.30pm and 6pm, two per cent greater than the previous record of 6513MW during a storm in August 2004.

APPENDIX E

Dr Ralph Craven
Tel: 04 495 6970
Fax: 04 495 6978
Email: Ralph.craven@transpower.co.nz

13 April 2006

Hon Trevor Mallard
Acting Minister of Energy
Executive Wing
Parliament Buildings
WELLINGTON

Dear Minister

Winter Security 2006

The purpose of this letter is to inform you of the work Transpower has initiated to ensure prudent contingency planning is in place for the upper North Island and upper South Island regions over the 2006 winter period. This is to cover off issues specific to winter including availability of generation in both regions.

Eight years ago the System Operator began convening such a group, initially to co-ordinate management of the potentially tight margins between power demand and supply in the summer period for the Upper North Island. In recent years this approach has also been extended to the winter period, and to the Upper South Island region, underscoring the need and importance for significant new grid investment proposed by Transpower to proceed.

Specifically, major upgrades (such as the proposed 400 kV transmission line between Otahuhu and Whakamaru) would increase the security margin in future years and, in combination with generation availability, lessen the need for such a micro-managed approach to contingency planning. This would reduce the administrative cost on participants, with flow-on benefits to the industry as a whole.

Upper North Island Winter Security

For the upper North Island (i.e. from Huntly north), we are following a similar process to that successfully followed in the past few years. This has seen Transpower, in its role as System Operator, facilitate the wider Auckland region's response to manage security of electricity supply over the winter months.

An Industry Response Group (which includes customers with key assets in the region - generators, lines and major industrial companies), is working with Transpower to plan for the 2006 winter period.

The primary influence on the power system limit to supplying power in the upper North Island region during winter is the capacity of the grid to bring generation into Auckland at times of peak demand. While at this stage there is no reason to expect an unmanageable supply situation this winter, the co-operative steps being taken (e.g. agreed contingency plans, regular meetings to assess load and supply issues) will enable a rapid response to any issues that may arise.

In addition, there is a constraint on the Otahuhu–Henderson line supplying Auckland and feeding into Northland. Transpower has an upgrade approved (by the Electricity Commission) for this line which would meet forecast load demands until 2013. However, that project is pending subject to Environment Court and local authority approval. The Group is aware of this situation and will factor the existing constraint into its planning for winter 2006.

Upper South Island Winter Security

Transpower as System Operator is also co-ordinating the upper South Island region's (i.e. from Waitaki Valley north) response to manage security of electricity supply over the winter months.

Transpower upgraded part of the Livingstone to Islington line (supplying Christchurch from the Waitaki Valley) earlier this year which has provided useful additional capacity to supply Christchurch and the upper South Island.

For this region, other than normal concerns about hydro resources at this time of year, the critical issue surrounds the required outage of a key transmission circuit to allow Transpower to undertake further upgrading. Work is currently underway to complete a new Islington to Kikiwa circuit by June 2006. This (together with other related work) will resolve the transmission capacity of Transpower's network to the top of the South Island for the foreseeable future.

As part of the work to commission this new line, there will be some outages of one of the two existing Islington – Kikiwa circuits over April/May 2006. While we do not envisage a problem during these outages, Transpower is working with key South Island participants (generators and lines companies) through an upper South Island Response Group to ensure contingency plans are in place to mitigate and manage the risk of load shedding and any interruption to consumers in the unlikely event of the failure of one of the other two transmission circuits occurring at the same time.

Transpower is happy to provide further information by way of a briefing should this be required.

Yours sincerely

Dr Ralph Craven
Chief Executive

cc Minister of Finance
Minister for SOEs
Roy Hemmingway, Chair, Electricity Commission
David Smol, MED

APPENDIX F

System Security Forecast Dec 2004				Annual Planning Report 2006								
SSF Ref	**SSF Issue**	**SSF Issue**	**Operational measures in place**	**APR Ref**	**Issue**	**Project**	**Timing**	**Cost ($m)**	**Project Type**	**Status**	**Region**	**EC Status**
3.2.2.2	Loss of Huapai-Marsden 220 kV circuit or Marsden-Maungatapere / Kaikohe-Maungatapere 110 KV circuit	Limits to avoid grid voltages falling below advised asset capability in the Northland area are reached.		5.2.1.1	Upper North Island Voltage Support	24 Mvar capacitors at Kaitaia	Dec-07	2.6	Reliability	Committed	Northland	Approved
3.2.2.1	Loss of Henderson-Southdown or Henderson-Otahuhu 220 kV circuit	The loading of the remaining 220 kV circuit into Henderson reaches stated asset capability and voltage stability limits.	Resource consent limitation.-temporary operational measures in place	7.5.1	Overloading of a 220 kV Henderson-Otahuhu circuit	Thermal upgrade of 220 kV HEN-OTA 1 & 2 circuits	physical work completed	2.3	Reliability		Northland	Approved
3.3.3.2	Loss of Otahuhu-Penrose 220 kV circuit	Loading on the remaining 220 kV circuit reaches stated capability	operational measures in place	7.5.4	Overloading of a 220 kV Otahuhu-Penrose circuit	Thermal upgrade of 220 kV OTA-PEN 5 & 6 circuits	2007	0.7	Reliability	Committed	Auckland	Approved
3.1.5	Loss of a major generating unit north of Whakamaru (either Huntly E3P or Otahuhu CCGT) and/or Loss of Otahuhu-Whakamaru 3 220 kV Circuit	Power Transfer limits to avoid voltage instability reached		5.2.1.2	Enhancement of 220 kV transmission capacity between Otahuhu and Whakamaru	Thermal upgrade of the 220 kV Otahuhu-Whakamaru 1 & 2 circuits	2007-09	13.5	Reliability	Committed	Auckland	Approved
3.4.2.3	Loss of Bombay-Hamilton 110 kV circuit	Loading of the remaining 110 kV circuit reaches stated capability	operational measures in place	8.5.1	Overloading of one of the 110 V Bombay-Hamilton circuits	New GXP at Huntly, and; Decommission Western Road GXP	2007	8.8	Reliability	Preferred	Waikato	Not Required
3.1.6	Loss of a major generating unit north of Whakamaru (either Huntly E3P or Otahuhu CCGT) and/or Loss of Otahuhu-Whakamaru 3 220 kV Circuit	Power Transfer limits to avoid voltage instability reached		5.2.1.2	Enhancement of 220 kV transmission capacity between Otahuhu and Whakamaru	New switching station at Huntly East	May-08	31.7	Reliability	Committed	Waikato	Approved in principle - pending updated cost estimates
3.5.3.1	Loss of Mount Maunganui-Tarukenga 110 kV circuit or Tarukenga-Tauranga 110 kV circuit	Grid voltages fall to minimum advised asset capability.	operational measures in place	9.5.1	Supply security of Tauranga and Mt Maunganui	New 25 Mvar capacitor at Tauranga 110 kV bus	Dec-07	3.5	Reliability	Committed	Bay of Plenty	Approved
3.5.3.1	Loss of Mount Maunganui-Tarukenga 110 kV circuit or Tarukenga-Tauranga 110 kV circuit	Loading of 110 kV circuits reaches stated capability.	operational measures in place	9.5.1	Supply security of Tauranga and Mt Maunganui	Replace conductor on 110 kV Hairini-Tauranga circuits	May-08	15.8	Reliability	Committed	Bay of Plenty	Approved
3.5.3.1	Loss of Mount Maunganui-Tarukenga 110 kV circuit or Tarukenga-Tauranga 110 kV circuit	Loading of 110 kV circuits reaches stated capability. Grid voltages fall to minimum advised asset capability.	operational measures in place	9.5.1	Supply security of Tauranga and Mt Maunganui	New 110 kV switching station at Hairini	May-08		Reliability	Committed	Bay of Plenty	Approved
				5.2.1.4	Thermal upgrade of the Central North Island 220 kV circuits	Thermal upgrade of the 220 kV Rangipo - Wairakei 1 circuit	Apr-06	See Notes	Economic	Committed	Central North Island	Decision Pending

3.7.3.2 3.7.3.1	Loss of various 220 kV circuits in region	Loading of Hawera–Waverly circuit reaches stated capability.	operational measures in place	11.5.2	Overloading of the 110 kV Stratford – Hawera - Waverly - Wanganui circuits	Replacing conductor on the Stratford-Hawera-Waverly circuits;	2010	Not yet costed	Reliability	Provisional	Taranaki	Not Submitted yet
3.9.3.1	Loss of various system components	Loading of the Wilton interconnecting transformer T8 can reach stated capability.	Temporary operational measures in place	13.5.1	Overloading of a 220/110 kV interconnecting transformer at Wilton	Replace interconnecting transformer with 200/250 MVA unit	2008	4	Reliability	Preferred	Wellington	Not Submitted yet
4.2.3.1	Loss of 110 kV Blenheim-Stoke circuit .	Grid voltage falls to minimum advised asset capability at Blenheim. Loading on the Kikiwa interconnecting transformer T1 and Argyle-Blenheim 110 kV circuit will reach stated asset capability	Temporary operational measures in place while new circuit is being strung	14.5.2	Overloading of the 110 kV Argyle-Blenheim circuit	Install new 110 kV Blenheim-Stoke circuit	2007	20.2	Reliability	Committed	Nelson - Marlborough	Approved
4.2.3.3	Outage of Stoke T7 or Kikiwa T1 220/110 kV interconnecting transformer	The other transformer will reach its stated capacity (also affects part of the West Coast region).	Temporary operational measures in place	14.5.1	Overloading of the 220/110 kV interconnecting transformer at Stoke	Replace existing transformer with 150 MVA unit	Dec-07	4	Reliability	Committed	Nelson - Marlborough	Approved
4.2.3.3	Outage of Stoke T7 or Kikiwa T1 220/110 kV interconnecting transformer	The other transformer will reach its stated capacity (also affects part of the West Coast region).	Temporary operational measures in place	15.5.1	Overloading of the 220/110 kV interconnecting transformer at Kikiwa	Install a second interconnecting transformer at Kikiwa.	Dec-07	5	Reliability	Committed	West Coast	Approved
4.1.1	Loss of a 220 kV circuit between Twizel and Islington.	Voltage stability limits are reached and loading on assets reaches stated capability. These limit the power transfer north of the Waitaki Valley.	Operational measures in place until duplexing complete	5.3.1.2	Reactive support between the Waitaki Valley and Christchurch	New 220 kV capacitor banks at Islington	2008	See Notes	Reliability	Preferred	Canterbury	Not Submitted yet
4.1.1	Loss of a 220 kV circuit between Twizel and Islington.	Voltage stability limits are reached and loading on assets reaches stated capability. These limit the power transfer north of the Waitaki Valley.	Operational measures in place until duplexing complete	5.3.1.2	Enhancement of the transmission capacity between the Waitaki Valley and Christchurch	Duplexing the 220 kV Islington-Livingstone circuit	May-07	25.8	Reliability	under construction	Canterbury	Not Submitted yet
4.4.3.2	Loss of the Ashley-Islington circuit	Grid voltage on the 66KV network north of Islington falls to minimum advised asset capability		16.5.1	Decommissioning the existing 66 kV Culverden-Waipara and Ashley-Islington circuits	33 Mvar capacitor bank at Southbrook	2006	1.2	Reliability	Committed	Canterbury	Approved
4.1.1	Loss of a 220 kV circuit between Twizel and Islington.	Voltage stability limits are reached and loading on assets reaches stated capability. These limit the power transfer north of the Waitaki Valley.	operational measures in place	5.3.1.2	Enhancement of the transmission capacity between the Waitaki Valley and Christchurch	Bussing the 220 kV Islington-Twizel circuit at Ashburton	May-08	7.3	Reliability	Committed	South Canterbury	Approved
				18.5.1	Overloading of a Frankton supply transformer	Install third supply transformer	2007	4	Customer specific	Committed	Otago-Southland	Customer Specific