

# Upper North Island Security

## Winter 07 Planning

20 April 2007

TRANSPower

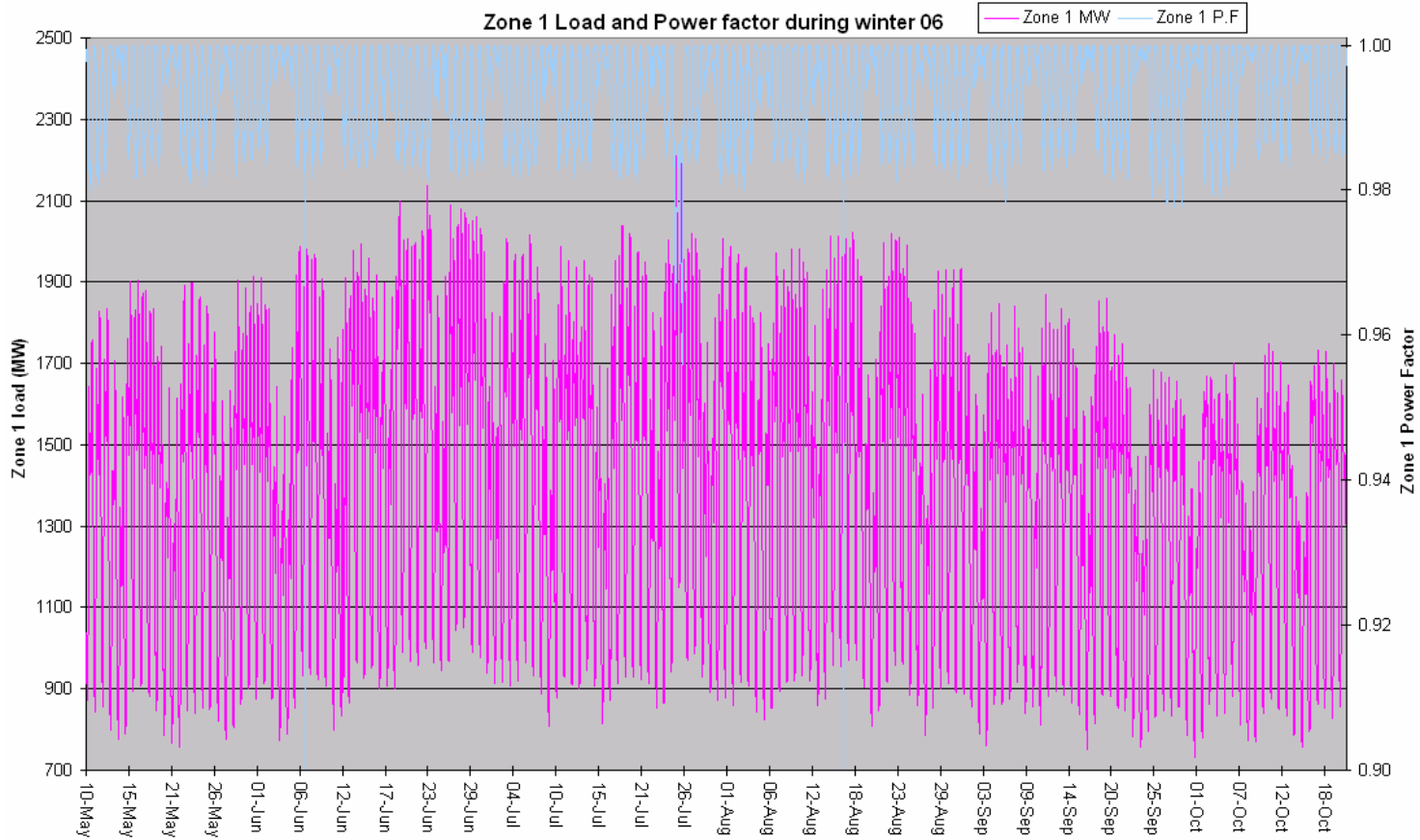


SYSTEM OPERATOR  
TRANSPower NZ LTD

24-7  
instant delivery



# Winter 07 – Winter 06 load review



- Winter 06 observed peak load was 2216 MW on 26 July
- Loads typically below 2100 MW
- Otahuhu Bus fault on 12 June
- National energy shortfall on 19 June

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Top 5 days peaks	
Time Stamp	Zone 1 Load
26-Jul-2006 08:00	2216
25-Jul-2006 18:20	2211
23-Jun-2006 08:20	2138
19-Jun-2006 17:50	2099
27-Jun-2006 18:30	2080

**TRANSPower**

## Winter 07 – Winter 07 Load Forecast

	2006	2007	%growth	2007	%growth
	Actual	Expected	of 2006	Prudent	of 2006
Top Energy	50.9	50.9	0.0%	55	8.1%
North Power	134.6	145	7.7%	154	14.4%
Vector	1698.5	1766	4.0%	1821	7.2%
Counties Power	87.4	89.7	2.6%	92.4	5.7%
NZ Steel	109.8	110	0.2%	127	15.7%
WVEL Network	6.5	8	23.1%	8.4	29.2%
<b>Total</b>	<b>2087.7</b>	<b>2169.6</b>	<b>3.9%</b>	<b>2258.8</b>	<b>8.2%</b>

- Based on half hour average loads
- Winter 2006 actual load based on 19 June 2006 17:30 to 18:00
- Winter 06 Expected load forecast was 2044 MW (4.9 % growth)
- Winter 06 Prudent load forecast was 2108 MW (8.2 % growth)



## Winter 07 – System changes

- Re-powering of Otahuhu condensers GT1 and GT2, expected to be available from mid April 07 (~100 MVAR)
- Huntly E3P (up to 400 MW) commissioning in progress
- Southdown E105 (up to 50 MW) commissioned
- Albany +100 MVAR commissioned late May 07.
- Upper North Island capacitor availability
  - Studies assume ~ 830 MVAR of capacitors available in Auckland, allowance for 50 MVAR unavailable
- Bombay 110kV system split inter-trip scheme and capacitor expected to be available for winter 07
  - Relieves 110 kV constraint on Bombay – Hamilton circuits
- Huntly East
  - Expected to be May 08



# Winter 07 – Interim Scenario Limits

Scenario	Huntly	Otahuhu B	HLY_OTa_2	OTA_WKM_3	N-1 Stability Limit		Thermal Limits		
					Contingency	Zone 1 Load limit (5% margin)	Contingent cct.	Protected cct.	Zone 1 Load limit (15 min)
1	YYYYY 4 x 250 MW @ 121MVA 1 x 40 MW @ 38MVA	Y 1 x 380 MW @ 202MVA	Y	Y	Otahuhu B	2390	-	-	-
2	YYYYY 4 x 250 MW @ 121MVA 1 x 40 MW @ 38MVA	out	Y	Y	HLY_OTa_2	2260	HLY_OTa_2	BOB_HAM_1&2	2300 assuming BOB SPS armed
3	YYYYY 4 x 250 MW @ 121MVA 1 x 40 MW @ 38MVA	Y 1 x 380 MW @ 202MVA	out	Y	Otahuhu B	2260	GLN_HLY	HLY_OTa_1	2050 assuming BOB SPS armed
1A	YYYYY 3 x 250 MW @ 121 MVA 1 x 40 MW @ 38 MVA 1 x 380 MW @ 200 MVA	Y 1 x 380 MW @ 202MVA	Y	Y	Otahuhu B	2430	-	-	-
2A	YYYYY 3 x 250 MW @ 121 MVA 1 x 40 MW @ 38 MVA 1 x 380 MW @ 200 MVA	out	Y	Y	HLY_OTa_2	2300	HLY_OTa_2	BOB_HAM_1&2	2350 assuming BOB SPS armed
3A	YYYYY 3 x 250 MW @ 121 MVA 1 x 40 MW @ 38 MVA 1 x 380 MW @ 200 MVA	Y 1 x 380 MW @ 202MVA	out	Y	Otahuhu B	2300	GLN_HLY	HLY_OTa_1	1970 assuming BOB SPS armed

Expected Winter 07 Load forecast is 2170 MW, Prudent Load is 2259 MW

### Assumptions:

1. Includes new 3 \* 50 MVA caps at HEP (x1) & PEN (x2)
2. Zone 1 P.F of 0.99 assumed
3. Marsden C2; 0/+70 MVA. Possibly increasing to +90 MVA
4. Five Otahuhu Syn. Condensers - GT 1 & 2; -30/+52 MVA each. GT 4, 5, & 6; -30/+33MVA each
5. Southdown generation = 2 x 50 MW @ 19 MVA, 1 x 18 MW @ 15MVA, 1 x 50 MW @ 40MVA
6. Glenbrook generation = 52 MW @ 20 MVA
7. HVDC North = 670 MW
8. Waikato generation = 900 MW
9. Includes 100 MVA cap at Albany, to be commissioned end of May 07
10. Excludes 50 MVA cap at Bombay

### Sensitivities

Equipment	Sensitivity
MDN_G2	0.8
OTA_GT4	0.68
HLY_Generation	0.43
Southdown (MW)	0.39
PEN or HEP Cap	0.6

Note these are for a power factor of 0.99.

These are indicative only and may vary based on system conditions.

- E3P sensitivity changes for variations in Huntly units.
- Thermal issues arise before stability for outages on HLY\_OTa\_2 (n-2)

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## Winter 07 – Summary

- N-G-1 limits maintained for prudent level of load forecast
  - with either E3P or HLY U1 being fully available for winter 07 –in progress
- Dependence on commissioning of:
  - BOB SPS –late May
  - ALB 100 MVar cap –late May
  - OTA SC1 & SC2 re-powering –in progress
- Further studies following commissioning to validate asset capability and study results
- HEN\_OTA intertrip arrangements being confirmed
- Contingency plan update & default system limits

