

# Upper North Island Security

Summer 06/07 Review

Winter 07 Planning

23 March 2007

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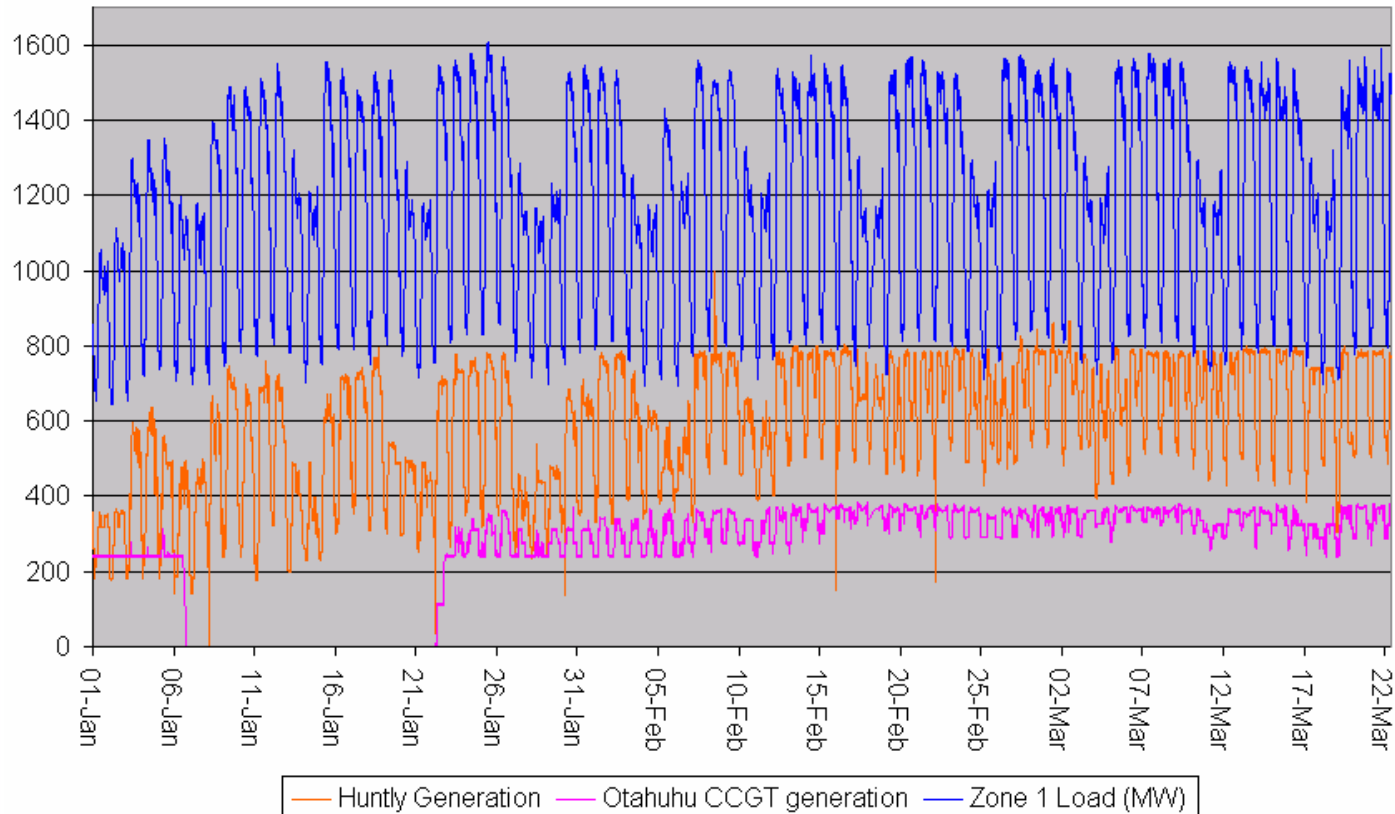
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# Summer 06/07 – Load and generation review

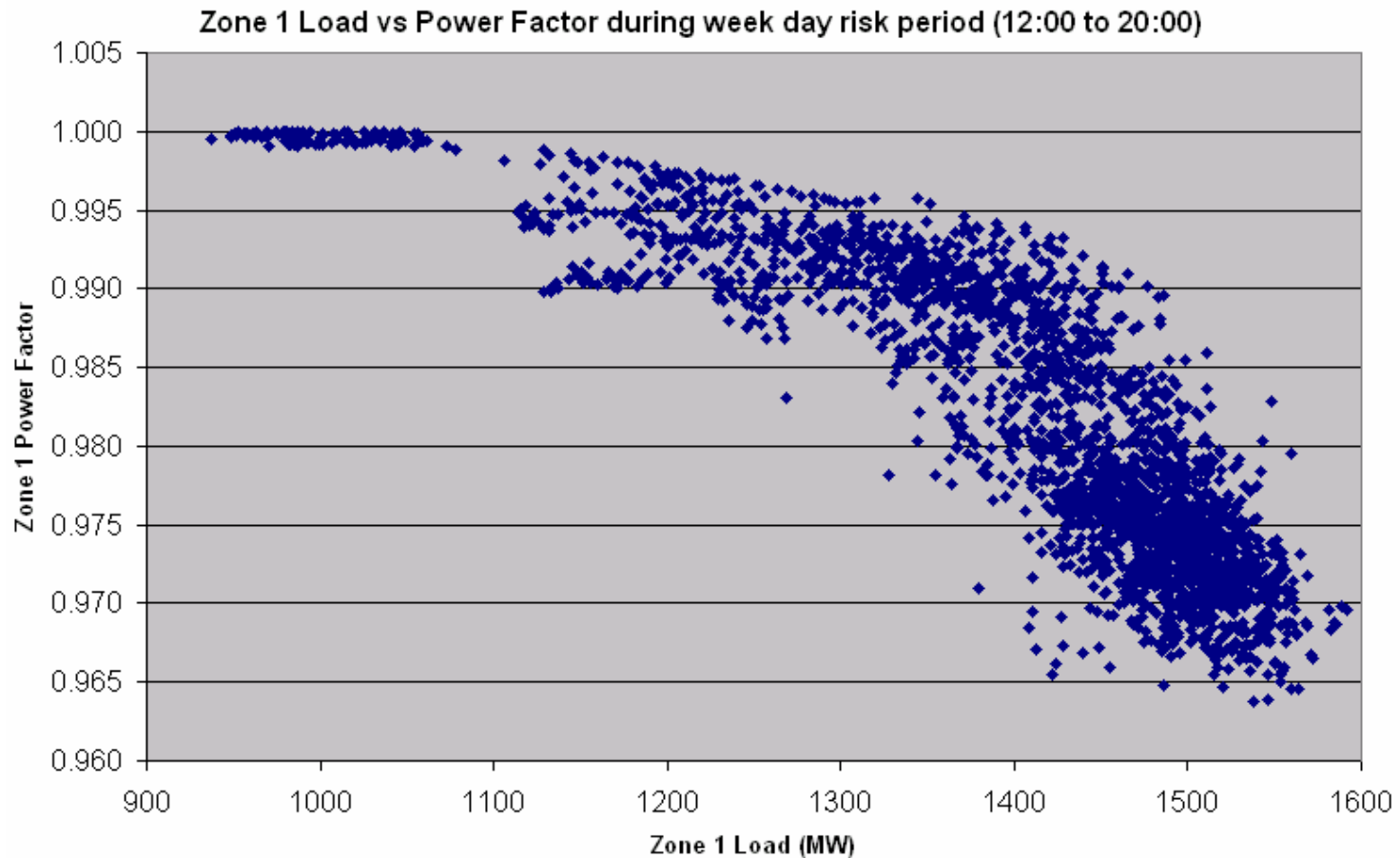
Summer 07 Zone 1 Load and Generation



- Huntly and Otahuhu CCGT generation fairly consistent
- Otahuhu CCGT returned to service as planned
- N-G limit was 1910 MW
- N-G-1 limit was 1690 MW



## Summer 06/07 - Power Factor review



- Power factor performance during risk period, January to March 07, weekdays, 12:00 to 20:00
- Power factor can be as low as 0.965 at peak loads, 0.970 was used in studies – increases stability limit by ~45 MW



## Summer 06/07 – Summary

- Stability / Thermal limit margins were comfortably maintained
- Expected and Prudent load forecast
  - 1651 MW Expected (5.3 % growth)
  - 1731 MW Prudent (10.3 % growth)
  - Actual observed peak during risk period was 1592 MW on 25 Jan @ 12:30 (1.5 % growth)
- Good availability of Huntly generation – typically three units connected



Summer 06/07

**Questions ?**

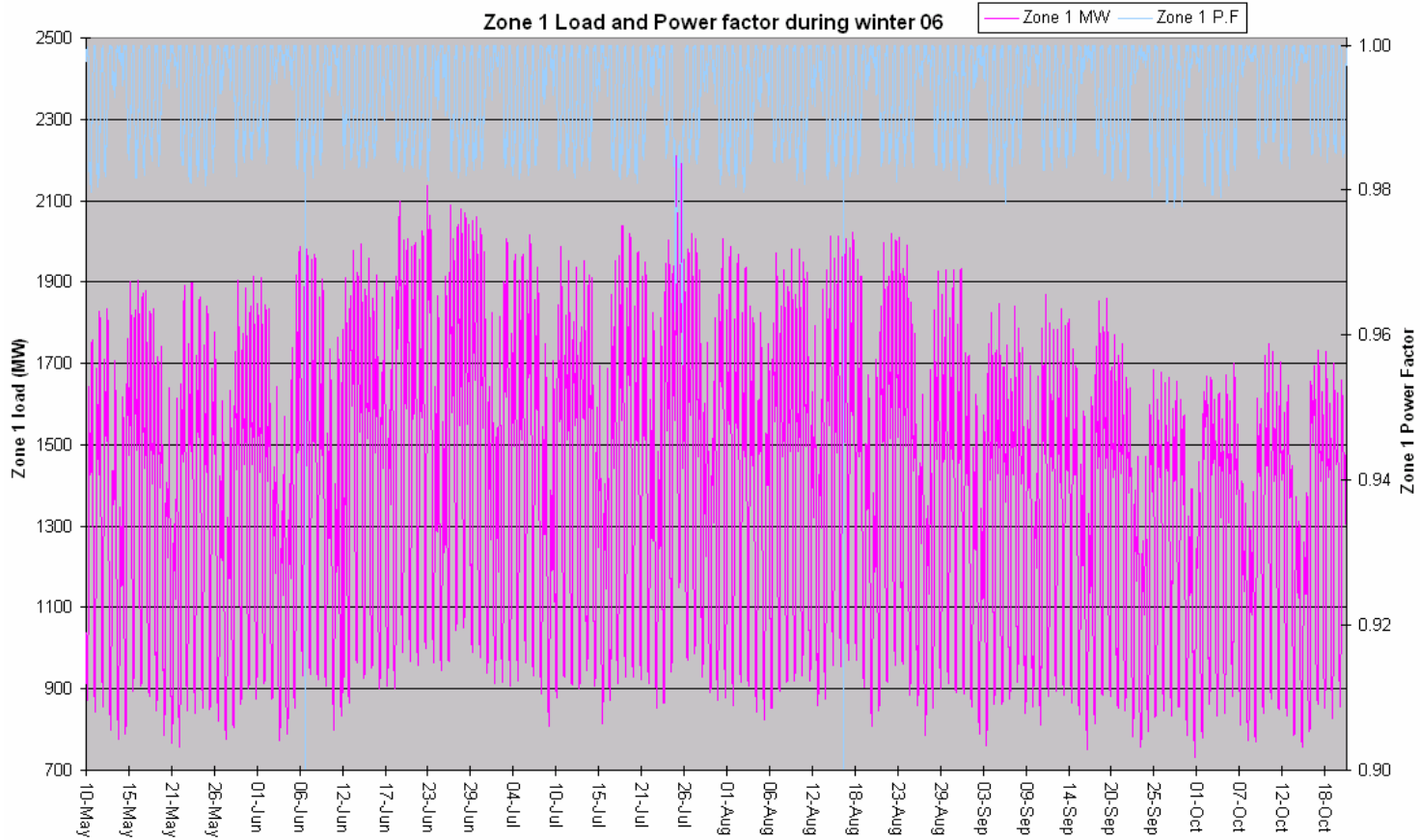
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# Winter 07 – Winter 06 load review



- 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

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## Winter 07 – Winter 06 load review

- Winter 2005 peak load was 1948 MW
- Winter 06 Expected load forecast was 2044 MW (4.9 % growth)
- Winter 06 Prudent load forecast was 2108 MW (8.2 % growth)
- Actual observed Winter 06 peak load was 2216 MW on 26 July @ 08:00 (13.7 % growth)



## Winter 07 – Winter 06 scenarios

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	2225	-	-	-
2	YYYYY 4 x 250 MW @ 121MVA 1 x 40 MW @ 38MVA	out	Y	Y	HLY_OTA_2	2095	HLY_OTA_2	BOB_HAM_1&2	2190
<b>Assumptions:</b>					<b>Sensitivities</b>				
1. Includes new 3 * 50 MVA caps at HEP (x1) & PEN (x2)					<b>Equipment</b>				
2. Zone 1 P.F of 0.99 assumed					<b>Sensitivity</b>				
3. Marsden C2; 0/+70 MVA					MDN_G2				
4. Assumes Western Road Load has been shifted					OTA_GT4				
5. Three Otahuhu A Syn. Con. = -30/+33MVA each					HLY_Generation				
6. Southdown generation = 2 x 50 MW @ 19 MVA & 1 x 18 MW @ 15MVA					Southdown (MW)				
7. Glenbrook generation = 52 MW @ 20 MVA					PEN or HEP Cap				
8. HVDC North = 670 MW									
9. Waikato generation = 900 MW									
10. Region peak pf 0.99									

- Table above summarises two scenarios used for winter 06.
- Winter 07 scenarios to be determined



## Winter 07 – System changes

- Re-powering of Otahuhu condensers GT1 and GT2, expected to be available from early April 07 (~100 MVAR)
- Huntly E3P (up to 400 MW)
- Southdown E105 (up to 50 MW)
- Upper North Island capacitor availability remains the same
  - 60 MVAR of capacitors (C4) out, expect 30 MVAR back for winter
  - 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 – Scenarios

- Scenarios to be considered for Winter 07
  - All equipment in service
  - Extended outage on Otahuhu CCGT
  - Extended outage on Huntly E3P
  - Extended outage on HLY-OTA-2
  - Extended outage on Otahuhu CCGT and Huntly E3P ?
- E3P post commissioning reliability
  - What Base load to be used in studies ?
- Post commissioning reliability of new Southdown unit (E105)



## Winter 07 – Summary

- Scenarios to be confirmed – Scenario and monitoring group
  - N-1 all equipment in service and OTC contingency
  - N-G-1 OTC out of service, HLY-OTA-2 contingency
- Distributor load forecast - Scenario and monitoring group
  - Prudent and expected loads
- Confirm E3P and Southdown E105 reliability and base load assumptions for scenarios

