

Upper South Island (USI)

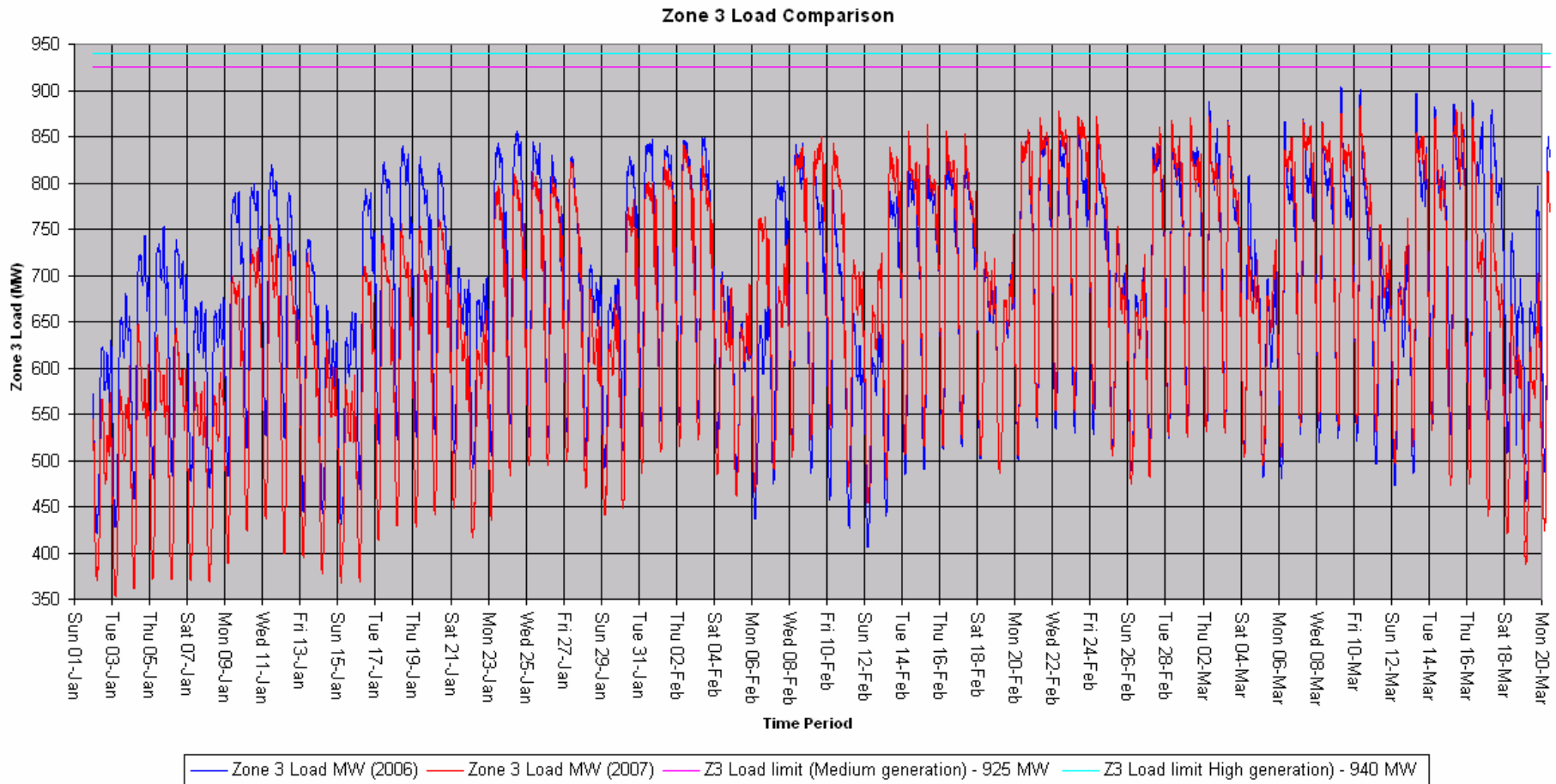
ISL_LIV outage
Winter Security 07

21st March 2007

Telephone Conference 2:00 - 3:30pm

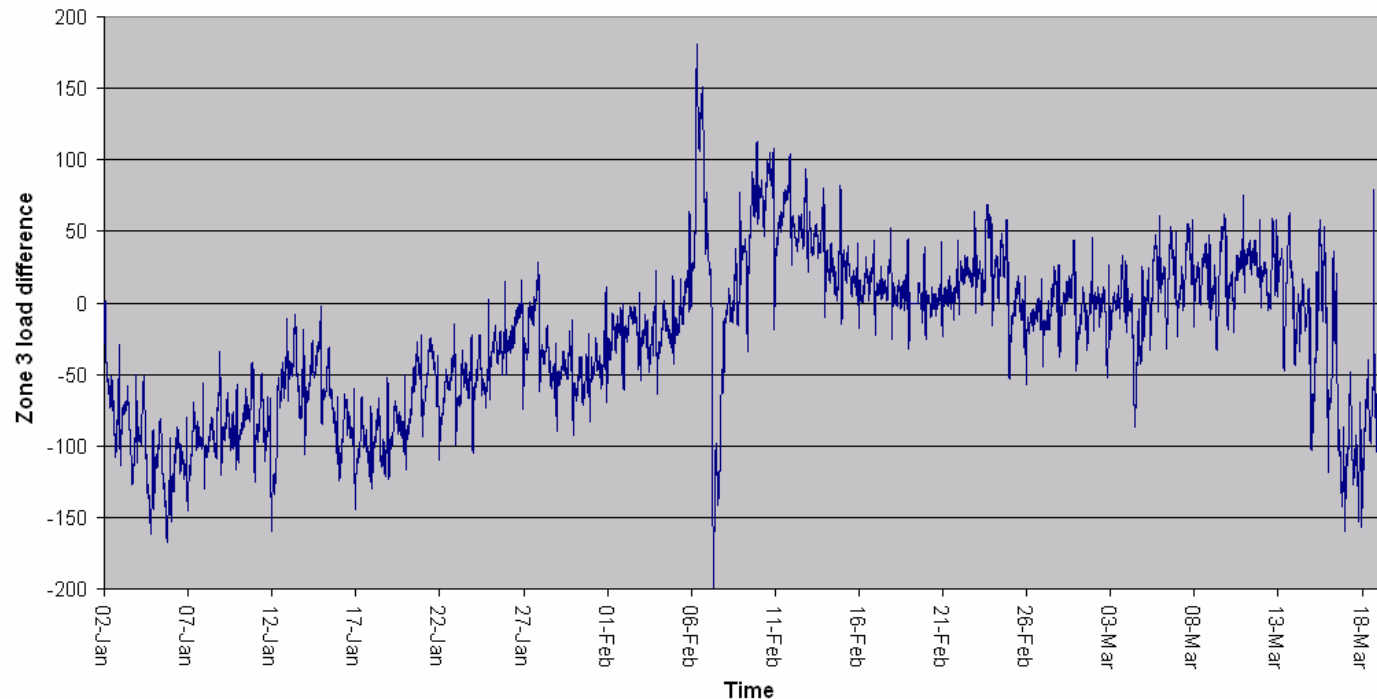


Zone 3 Load Comparison



Zone 3 Load Comparison

Zone 3 Load comparison (2007 Load - 2006 Load)



- High irrigation load in January 2006 due to dry conditions, less irrigation load in January 2007.

-February 2007 loads initially higher than for the same period last year, trending down towards a repeat of last year.

-March 2007 Load initially higher then found to be lower than for the same period last year.



ISL_LIV_1 Outage Assessment

(26 Feb to 5 April 2007)

Summary

- Highest Zone 3 load observed to date was 885 MW on 9 March 2007 08:10 (Limit of 925 MW – Medium generation scenario)
- Load profile very similar to last year as expected
- Concern with P.F performance, zone 3 power factor observed to be lower than expected at times
 - Summer 07 vs summer 06 P.F to be reviewed



Questions ?



USI Load Assessment for Winter 2007

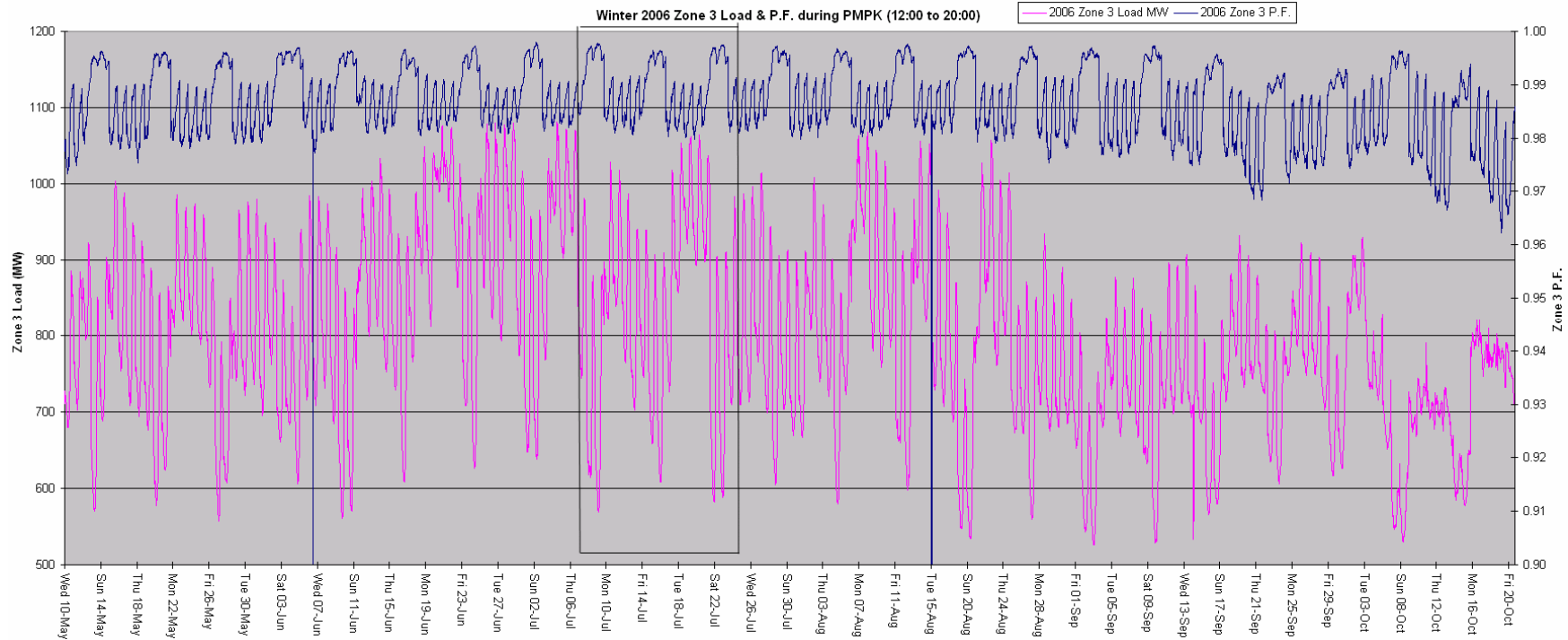
Upper South Island Winter 2007 Load Estimate						
	2006	2007	%growth	2007	%growth	Controllable
	Actual (MW)	Expected (MW)	of 2006	Prudent (MW)	of 2006	load
Network Tasman	140	143	2.20%	145	4.20%	0
Marlborough Lines	59	60	3.00%	63	8.00%	0
Buller	13	13	0.00%	17	29.98%	4
Mainpower	84	87	2.57%	88	4.23%	0
Orion	625	625	0.02%	662	5.94%	0
Electronet	26	28	6.79%	31	18.23%	5
Electricity Ashburton	40	43	9.00%	43	9.00%	
Alpine	79	81	2.00%	83	4.00%	0
Total	1066	1080	1.32%	1133	6.26%	

Notes:

- Expected load forecast assumed normal levels of embedded generation
- Prudent load forecast assumed minimum levels of embedded generation
- The 2006 figures were from the half hour period of 1730 to 1800 on the 29th June 2006 (expected Winter 06 load was 1055 MW, observed load was 11 MW above this)
- Need to further clarify Expected and Prudent load forecast methodology



USI Winter 06 Load and P.F. profile

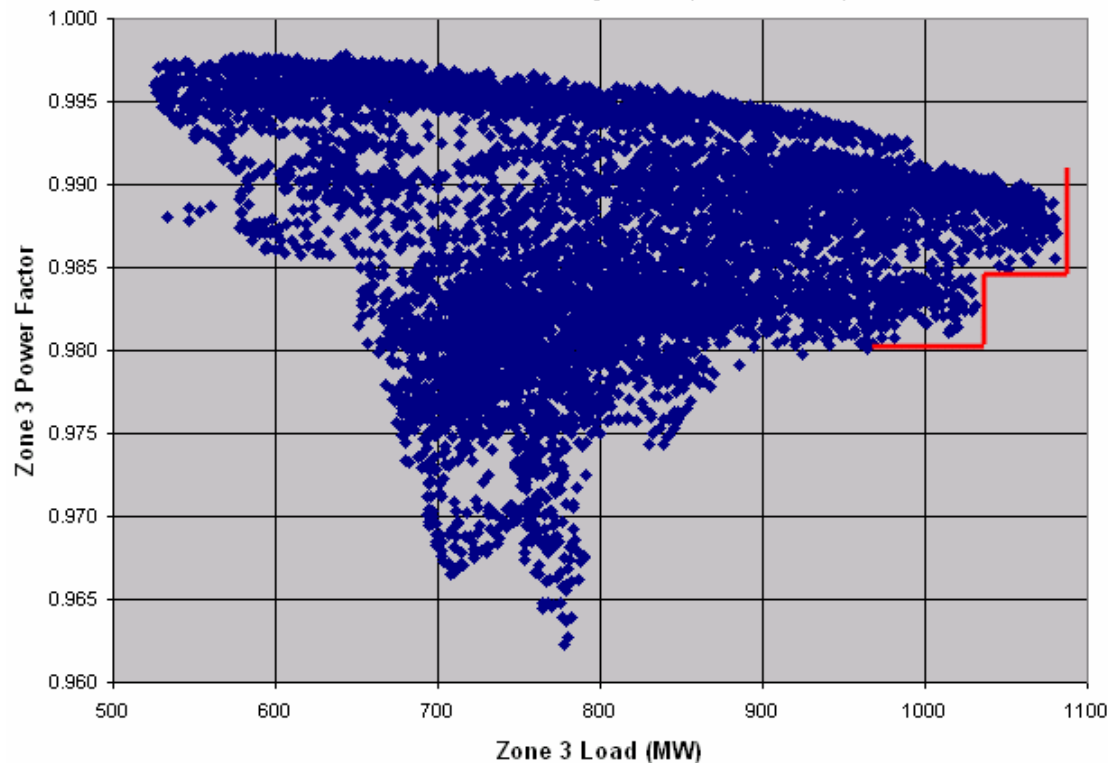


- Winter 06 PM loads between 12:00 to 20:00
- Holiday period between 9 July to 24 July, no noticeable change, daily profiles to be analysed
- Peak loads driven by weather events
- P.F performance has been consistent
- Load drops off rapidly end of August



USI Winter 2006 Power Factor

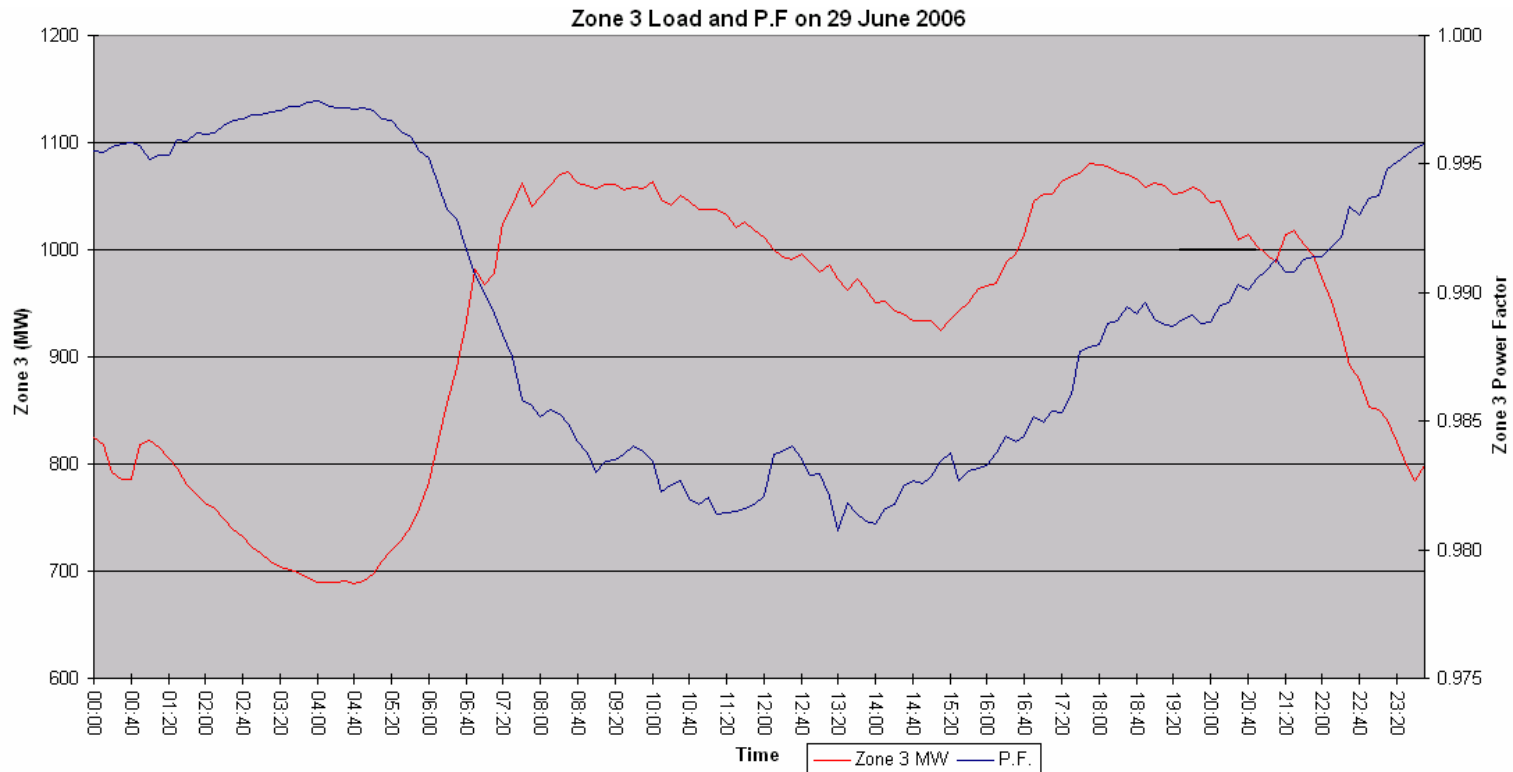
Winter 2006 Zone 3 P.F. during PMPK (12:00 to 20:00)



- Winter 06 PM loads between 12:00 to 20:00
- For loads between ~900 MW to ~1000 MW P.F is 0.980
- For loads above ~1030 MW P.F improves to 0.985
- Further work of P.F performance vs time of day
 - Lower P.F appears to be early PM / Weekends



USI peak load day profile during Winter 06



Notes:

- Peak load of 1080 MW observed at 17:50, concurrent P.F. was 0.988
- Morning peak of 1073 MW had a slightly worse P.F. of 0.985



USI Limits Winter 2007

Based on scenarios 2006 –minor adjustments

- Interim rating of ISL_LIV – interim duplexing
- Standard USI voltage profile ISL ~ 226.6 kV
- All reactive plants in USI available and in service as required (including new SBK cap.)
- Peak winter load power factor 0.98
- ISL & STK condensers available
- Sensitivity of USI AUVLS



USI Initial Limits Winter 2007 -Thermal

All equipment in service

- Voltage stability sets transfer limit
- Thermal limits in excess of
 - 1135 MW –summer ratings (contingency of ASB_TIM_TWZ)
 - 1321 MW –winter ratings



USI Initial Limits Winter 2007 – Voltage Stability

Results

	AUVLS ARMED		AUVLS DISABLED	
	(N - 1)	(N - G - 1)	(N - 1)	(N - G - 1)
Voltage Stability Limit	1148.7	1123.7	1123.7	1098.7
Constraint RHS	1074.5	1049.5	1046.3	1021.3
Thermal Limit	~ 1321	~ 1321	~ 1321	~ 1321

USI maximum generation profile	
	MW
COB	32
ARG	11
COL	39
KUM	10
HBK	25
TKA	25
TKB	160
Total	302

(N-1) = N (critical circuit contingency is ASB_TIM_TWZ)

(N-G-1) = Circuit + Generator contingency (critical generator is HBK, ~25 MW impact)

USI Steady State Voltage Profile = good

USI Post Contingency Voltage Profile = good



Summary

- N-1 scenario can be managed with AUVLS
- Look at options to mitigate risk of extended outage of Highbank (-G scenario)
- School holiday load and power factor profile to be reviewed
- Scenario group meeting to clarify definition of expected / prudent load forecasts and review plant availability

