

Upper South Island (USI)

Winter 07 Review ISL_LIV Outage

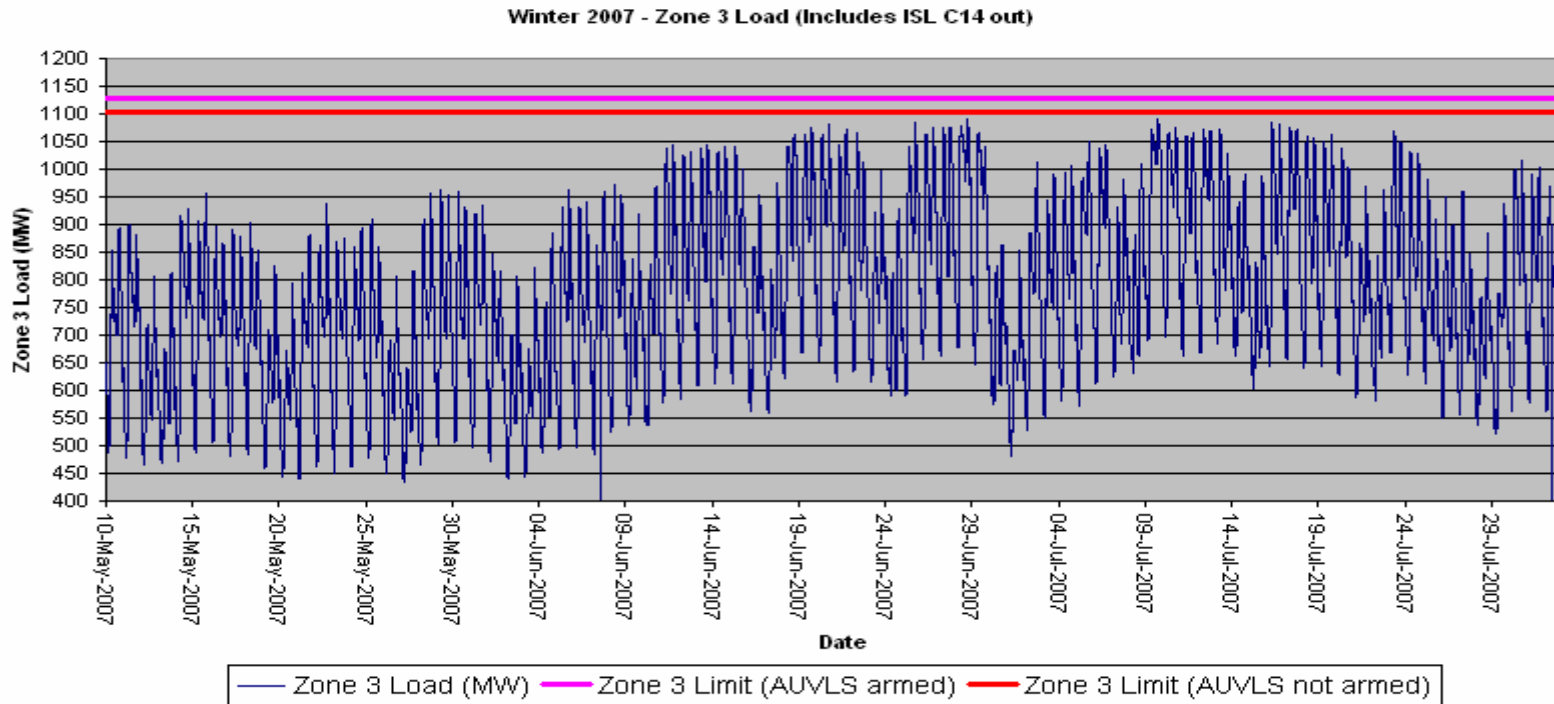
(Version 3, updated 9/10/2007)

15th August 2007

Telephone Conference 2:00 - 3:00pm



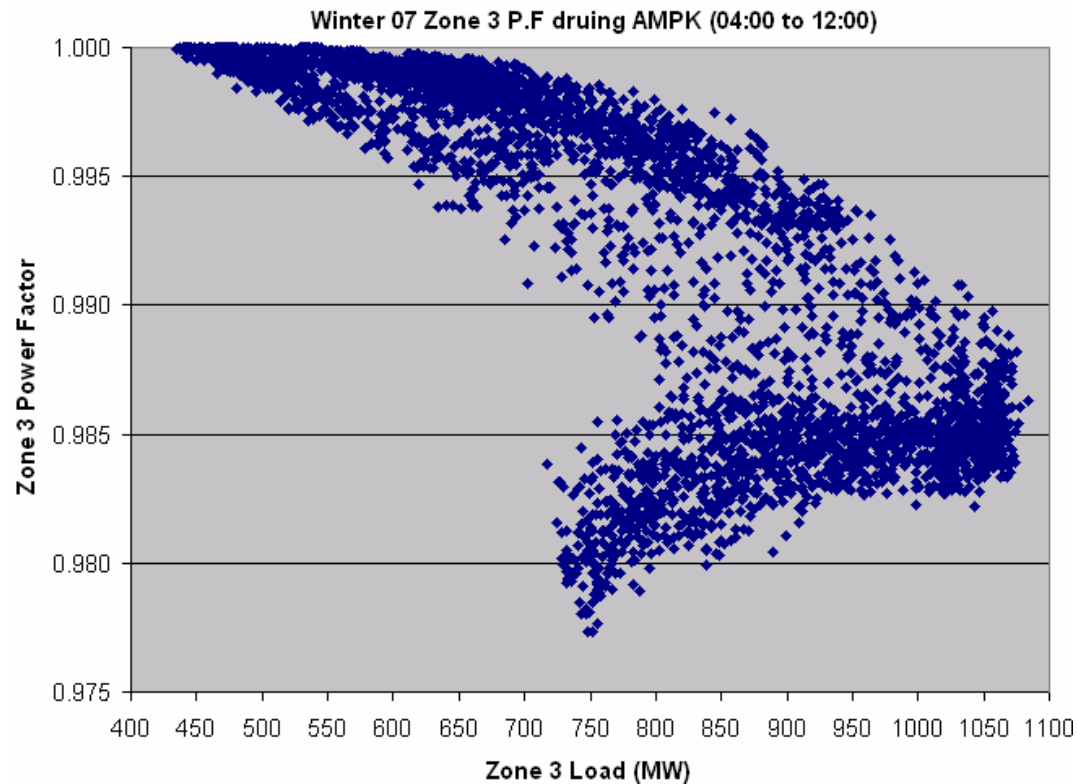
USI Winter 07 Review – MW Load



- System Limits
 - N-1 1129 MW (ISL C14 was out)
 - N-G-1 104 MW (ISL C14 was out)
- Winter 07 Peak Load was 1090 MW from 09 July 17:40 (10 min instantaneous data)
 - Expected planning peak 1078 MW
 - Prudent Planning peak 1131 MW
- Winter 06 Peak load was 1081 MW from 29 June 17:50



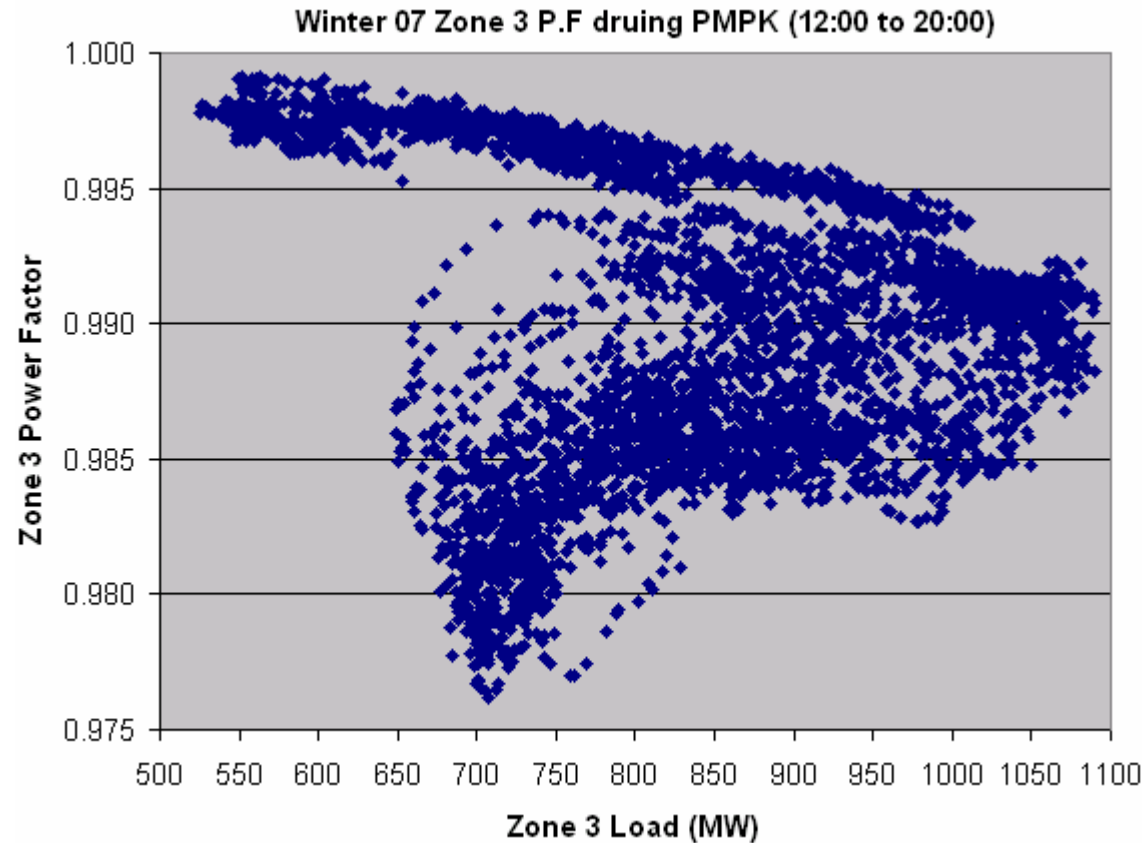
USI Winter 07 Review – AM Power Factor



- At peak loads P.F ~0.983
- Planned for an AM P.F of ~0.980
 - P.F performance slightly better than expected



USI Winter 07 Review – PM Power Factor



- At peak loads P.F ~0.988
- Planned for an PM P.F of ~0.985
 - P.F performance slightly better than expected



USI Winter 07 Review – Summary

- Good alignment between planning and actuals (load forecast and pf)
- Forced outage ISL C14 (30 MVAR's)
- Planned outages well co-ordinated –TKA/TKB
- Winter weather conditions fairly typical although cold lower SI.
(July climate summary: http://www.niwascience.co.nz/ncc/cs/mclimsum_07_07)
 - The national average temperature of 8.1 °C was 0.2 °C above normal. However this belies the north/south contrast with mean temperatures at least 1.0 °C below average over much of the southern half of the South Island. Freezing conditions existed for much of July in Central Otago and inland Southland. At Lauder (Central Otago), air temperatures were constantly below zero from July 12th to 21st, and there were 13 days from July 7 to 22 with minimum air temperatures below –10.0 °C.
 - In contrast, temperatures were at least 0.5 °C above average throughout much of the North Island. Rainfall was double normal in Hawke's Bay, parts of Northland, and the South Canterbury–Otago coast, but was 50 percent (half) or less of average in the north and west of the South Island. July was very sunny in inland South Island areas not affected by fog, as well as coastal Otago and north Westland, but rather cloudy in the east of the North Island.



ISL_LIV Outage Requirements

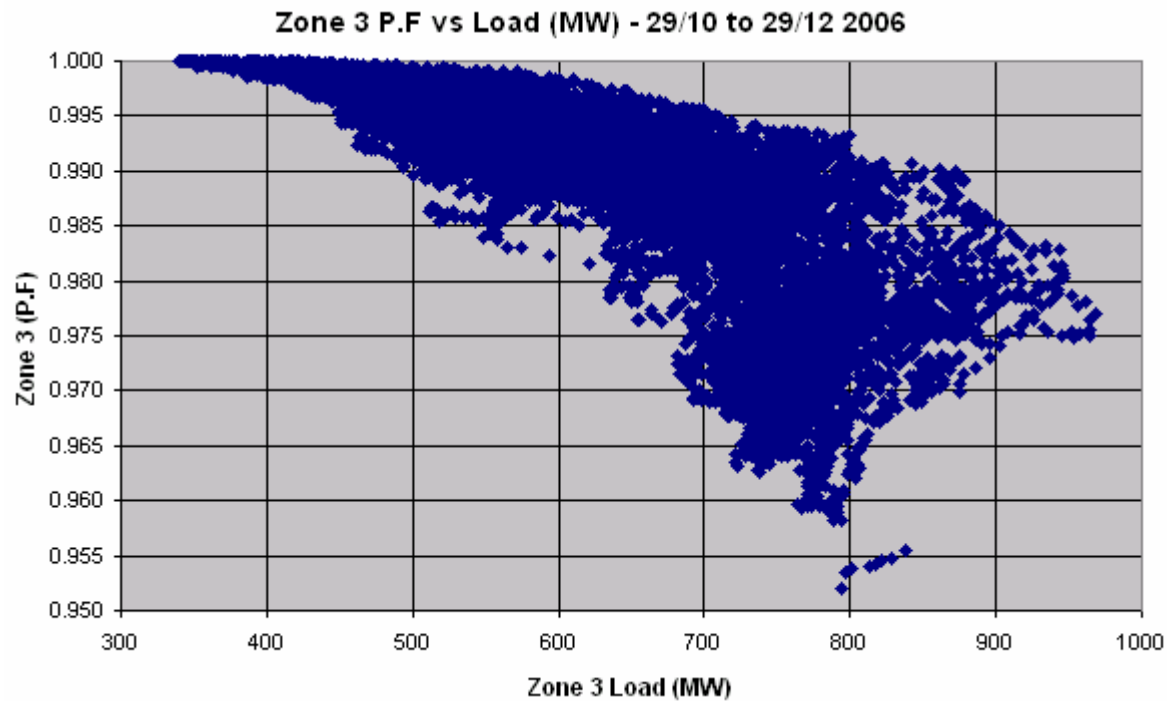
- Outage from 27 October 07 to 14 December 07
 - Required to complete duplexing circuit
 - Thermal rating of circuit to double (to be re-rated to 556 / 620 MW)
- Contingency of ASB_TIM_TWZ
- HBK not expected to be generating due to irrigation

Limits;	Station	Scenario 1 (Medium) (MW)	Scenario 2 (High) (MW)	Scenario 3 (MW)
	Arnold	3	3	As per scenario 2
	Argyle	8	11	
	Cobb	20	30	
	Coleridge	25	35	
	Highbank	0	0	
	Kumara	10	10	
	Tekapo A	15	25	0
	Tekapo B	80 (2 machine)	160 (2 machines)	50 (1 machine)
	Total	161	274	194
	Zone 3 Load limit	921	936	926

- Limits based on P.F of 0.97
- AUVLS armed



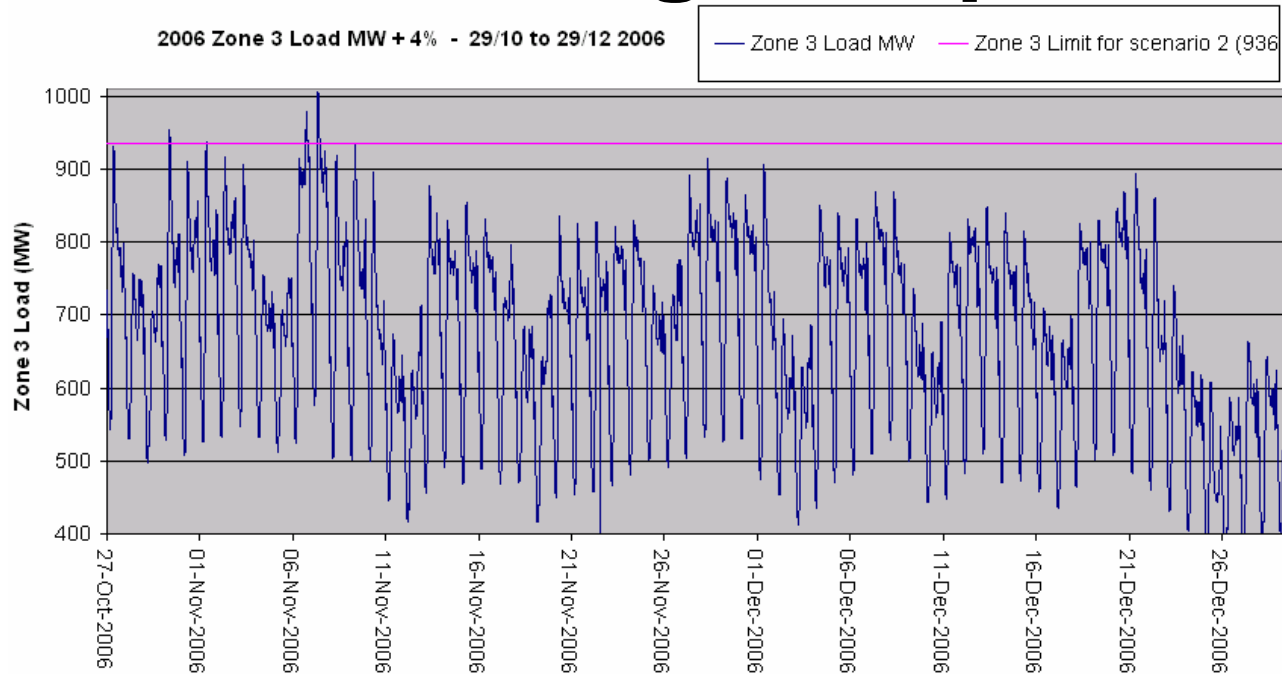
ISL_LIV Outage Requirements



- Outage assessed for a P.F of 0.97



ISL_LIV Outage Requirements



- Average expected load peak of 870 MW (including 4% load growth)
- Expected worst case peak of 1007 MW, (07 Nov 06 08:20 =970 MW + 4% load growth)
 - ~60 MW of controllable load available
 - ~10 MW of extra controllable load at a price (to be confirmed)
- Loads dependent on weather / soil conditions
 - Dry => high Irrigation load (6'th and 7'th Nov)
- Loads expected to trend down after ~ first 2 weeks of November
 - Need to monitor loads closely during first half of November



ISL_LIV Outage – Concurrent Outages

Outage Blocks	Start Date & Time	End Date & Time
ISL_WPR_CUL_KIK_2	Tue 23/10/2007 07:30:00	Sat 03/11/2007 18:00:00
TKA1 (12.6 MW lost)	Sat 13/10/2007 20:31	Wed 31/10/2007 18:00
TKA1 (25 MW lost)	Tue 6/11/2007 06:30	Tue 6/11/2007 18:00

- ISL_LIV 27 Oct – 14 Dec
 - recall 4-5 days.
- Concurrent outages to be resolved
- ISL_WPR_CUL_KIK_2 outage required for new KIK inter-connector transformer
- High risk on 29th, 30th and 31st August
 - Circuit and generation outage (ISL_KIK_2 & TKA)
 - Risk dependent on load and generation profile
 - Possibility of finishing generation outage early
 - Option of starting/finishing circuit outage early (ISL_KIK_2)
 - Possibility of starting ISL_LIV outage ~5 days late; on 1 August
- Assessment information POCP: <http://pocp.redspider.co.nz/>



ISL_LIV Outage – Summary

- Manageable to N-1 with full plant available
- First 2 weeks of NOV higher risk period
- Reliance on controllable load & AUVLS for some peaks
- Short duration outages - co-ordinated against actual system conditions
- Long duration outages - conflict to be resolved.



Winter 2008 -Look Ahead

- ISL_LIV duplexing complete –increase to USI thermal limits
- ASB Bussing –May 2008
 - Changing ISL_TIM_TWZ 220 kV circuits at ASB to make additional circuits ASB_TIM_TWZ 2 and ASB ISL 1
 - Increases system limits by ~40 MW (4% of 1000 MW)
- New 75 MVar capacitor at ISL –May 2008 –awaiting EC approval
 - Increases system limits by ~30 MW (3% of 1000 MW)
- New KIK inter-connector transformers
 - September 2007
 - Current rating 50 MVA, new rating 150 MVA. On load tap changer.
- New STK inter-connector transformers
 - September 2007
 - Current rating 60 MVA, new rating 150 MVA. On load tap changer.
- New SVC's –awaiting EC approval
 - 40 MVA at KIK to be commissioned in 2009
 - 100 MVA at ISL to be commissioned in 2009



Summary

- Winter 2007 – no issues arising
- ISL_LIV outage requirements
 - N-1 can be maintained
 - co-ordinate plant availability / outages
 - prepare contingency plan
- Winter 2008 –manageable
 - N-G-1 maintained
 - watching brief on key projects.

