

Upper North Island (UNI) Security

Winter 2011 Planning Update
20th May 2011



SYSTEM OPERATOR

UNI Forum

- Purpose
 - Update UNI participants on information and studies completed to date for Winter 2011.
- Approach
 - Gathered information about winter security issues for Upper North Island.
 - Assumptions made for peak load, power factor, and regional generation availability.
 - Voltage stability limits reviewed across a range of scenarios with currently available information, limits indicative only.
 - Determine whether a contingency plan is required.



Winter 2011 – Scenarios Studied

- Potential scenarios considered:
 - All equipment in service
 - Outage of a Huntly 250 MW Unit
 - Outage of Huntly Unit 5
 - Outage of Otahuhu B
 - Outage of Otahuhu B and a Huntly 250 MW Unit

Scenario	Huntly Units 1- 4 & 6	Huntly Unit 5	Otahuhu B
1	3 x 250 MW @ 121 MVar 1 x 50 MW @ 38 MVar	1 x 405 MW @ 200 MVar	1 x 395 MW @ 202 MVar
2	2 x 250 MW @ 121 MVar 1 x 50 MW @ 38 MVar	1 x 405 MW @ 200 MVar	1 x 395 MW @ 202 MVar
3	3 x 250 MW @ 121 MVar 1 x 50 MW @ 38 MVar	Out	1 x 395 MW @ 202 MVar
4	3 x 250 MW @ 121 MVar 1 x 50 MW @ 38 MVar	1 x 405 MW @ 200 MVar	Out
5	2 x 250 MW @ 121 MVar 1 x 50 MW @ 38 MVar	1 x 405 MW @ 200 MVar	Out



Winter 2011 – Assumptions

- Generation:
 - Southdown = 170 MW.
 - Glenbrook = 55 MW.
 - Ngawha = 24 MW.
 - Waikato Block = 800 MW.



Winter 2011 – Assumptions

- Load:

	2010 Regional Peak* (MW)	Expected Forecast Load for 2011 (MW)	<i>Expected</i> Forecast Difference from 2010	Prudent Forecast Load for 2011 (MW)	<i>Prudent</i> Forecast Difference from 2010
Counties Power	91	96	6%	102	12%
WEL Networks	6.6	8.2	24%	9.1	38%
Northpower	139	146	5%	150	8%
NZ Steel	115	120	4%	120	4%
Top Energy	66	54	-18%	76	15%
Vector	1722	1760	2%	1787	4%
Total Zone 1	2140	2184	2%	2245	5%

- No load control assumed.
- 2010 UNI Peak recorded on 19 July at 18:20.
- 2011 Expected/Prudent network loads supplied by distributors and diversified.
- * Actual peaks as recorded concurrent to the Zone 1 2010 peak – individual peaks for network companies is likely to be higher.



Winter 2011 – Assumptions

- Zone 1 peak power factor of 0.989
- Albany dynamic reactive support
 - SVC: -100/+100 MVar capacity
- Otahuhu Syn. Condensers
 - SC 1: -29/+52 MVar capacity
 - SC 5: -29/+33 MVar capacity
 - SC 6: -29/+33 MVar capacity
- HVDC = 400 MW North
- Rest of the North Island modelled for GZ loads as per winter peak



Winter 2011 – Outages

- Notified generator outages (as per POCP 18/05/11).

POCP Gen		Jun-2011														Jul-2011																
starting:		Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon				
Outage Block	MW Loss	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	01
HLY5	418																															
HLY3	243																															
SWN_5	50																															
SWN_2	45																															
SWN_3	20																															
SWN_1	45																															
SWN_3	20																															

POCP Gen		Aug-2011														Sep-2011																
starting:		Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat				
Outage Block	MW Loss	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	01
HLY2	243																															
SWN_5	50																															
HLY3	243																															
SWN_3	20																															
SWN_2	45																															
SWN_3	20																															
SWN_1	45																															



Winter 2011 – Outages

- Notified transmission outages (as per POCP 19/05/11) to be managed through the normal outage planning process.

Outage Block	Start	End	Type	Planning Status
DRY_GLN_1	9/06/2011 07:30	10/06/2011 18:00	daily	Confirmed
DRY_GLN_2	7/06/2011 07:00	8/06/2011 18:00	daily	Confirmed
DRY_HLY_1	1/06/2011 07:00	3/06/2011 18:00	daily	Confirmed
HAM_OHW_1	18/06/2011 07:00	19/06/2011 18:00	daily	Confirmed
	13/08/2011 07:00	14/08/2011 18:00	daily	Tentative
HLY_SFD_1	27/06/2011 07:00	29/06/2011 18:00	daily	Confirmed
HLY_TWH_1	21/07/2011 07:00	21/07/2011 18:00	daily	Tentative
OHW_OTA_1	25/07/2011 07:00	25/07/2011 18:00	daily	Tentative
OHW_OTA_2	26/07/2011 07:00	26/07/2011 18:00	daily	Tentative
OHW_WKM_1	20/06/2011 07:00	23/06/2011 18:00	continuous	Confirmed
	18/07/2011 07:00	19/07/2011 18:00	daily	Tentative
OTA_WKM_1	7/06/2011 07:00	8/06/2011 18:00	continuous	Confirmed
	4/07/2011 07:00	7/07/2011 18:00	daily	Tentative
OTA_WKM_2	11/07/2011 07:00	14/07/2011 18:00	daily	Tentative
	1/09/2011 07:00	6/09/2011 18:00	daily	Tentative
TKU_WKM_1	1/07/2011 07:30	1/07/2011 17:30	daily	Confirmed
TKU_WKM_2	1/06/2011 07:00	2/06/2011 18:00	continuous	Confirmed
	9/06/2011 07:00	10/06/2011 18:00	continuous	Confirmed
	1/08/2011 07:00	1/08/2011 18:00	daily	Tentative



Winter 2011 – Stability Limits

- Zone 1 voltage stability limits calculated with currently available information

Scenario	Power Factor	N-1 Stability Limit	
		Contingency	UNI Load Limit (MW)
1	0.989	Otahuhu B	2564
2	0.989	Otahuhu B	2534
3	0.989	Otahuhu B	2474
4	0.989	Huntly Unit 5	2474
5	0.989	Huntly Unit 5	2354

➤ Approximately 35 MW of additional benefit if another OTA SC is run.



Winter 2011 – Summary

- With currently available information, studies show that the forecast UNI peak winter demand can be met with n-1 security under all study scenarios.
- Based on margins available no current requirements for:
 - NIWA report
 - UNI Contingency plan
- Will be re-assessed if situation changes:
 - Unexpected outages on generators
 - Unexpected outages on transmission plant
- Next update:
 - Reconvene if any generation/transmission issues arise.

