

Security Policy Review: Credible Event Management

Appendix 2 – Network Assumptions

December 2009



SYSTEM OPERATOR

Keeping the energy flowing

TRANSPower



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Appendix 1 – Network Assumptions

Generation on the core grid is assumed to be as required to meet the system load. Local generation in the region is assumed to be zero to maximize circuit and 220kV interconnecting transformer loadings. Where the direction of the HVDC transfer has an impact on the loadings in the region, both HVDC North transfer and South transfer are considered.

Assumptions with regard to local generation and HVDC flow are given in the following tables.

The following network configurations are in place

- Marsden T1 and T2 are in service
- The Hepburn-Mount Roskill 110kV circuits are in service
- EDG 220/110/11 kV TF4 and TF5 assumed out of service due to off load time issues at Kawerau

The following special protection schemes are enabled:

- The Hepburn-Mount Roskill 110kV overload protection scheme is enabled

The following network upgrades/generator units have been represented in the network model:

- New Drury substation and associated upgrades at Otahuhu have been included in the studies
- Woodville-Mangamaire & Mangamaire-Masterton 110kV circuits upgrade (2010)
- Nga Awa Purua (NAP) geothermal generator (to be commissioned in 2010)

The NAaN, NIGUP & Otahuhu diversity upgrades have not been considered.

North Island

<i>North Island</i>	<i>Study Type</i>	<i>Assets</i>	<i>Local generation</i>	<i>HVDC Flow</i>	<i>HVDC Transfer</i>
Northland	<i>B/B & Txs</i>	MDN T1 & T2 in service	Ngawha = 0	North	660 (P2) 200 (P1)
Auckland	<i>B/B & Txs</i>			North	660 (P2) 200 (P1)
Hamilton	<i>B/B</i>	EDG T4 & T5 out of service	Nga Awa Purua (NAP) = 147, Kawerau = 95, Arapuni = 100, Karapiro = 40	North	660 (P2) 200 (P1)
	<i>Txs</i>	EDG T4 & T5 out of service	As above with OTA C = 0	North	660 (P2) 200 (P1)
Edgecumbe	<i>B/B</i>	EDG T4 & T5 out of service	Nga Awa Purua (NAP)=147, Aniwhenua = 10, Matahina = 10, Kawerau = 50, Wheo = 5	North	660 (P2) 200 (P1)
	<i>Txs</i>	EDG T4 & T5 out of service	As above with OTA C =0	North	660 (P2) 200 (P1)
Hawkes Bay	<i>B/B</i>		Tuai =18	North	660 (P2) 200 (P1)
	<i>Txs</i>		Tuai =0	North	660 (P2) 200 (P1)
Taranaki	<i>B/B</i>		Kapuni, Patea & Whareroa =0	North	660 (P2) 200 (P1)
	<i>Txs</i>		Kapuni, Patea & Whareroa =0	North	660 (P2)

<i>North Island</i>	<i>Study Type</i>	<i>Assets</i>	<i>Local generation</i>	<i>HVDC Flow</i>	<i>HVDC Transfer</i>
Bunnythorpe	<i>B/B & Txs</i>		Te Apiti =0 Mangahao = 0	North	660 (P2) 200 (P1)
	<i>B/B</i>	WILT8 out of Service	Te Apiti =91 Mangahao = 0	South	400 (P2)
	<i>Txs</i>	WIL T8 in service (250MVA) MGM-MST out of service	Te Apiti =0 Mangahao = 0	South	400 (P2)
Wellington	<i>B/B & Txs</i>	WIL T8 out of service	Te Apiti =0 Tararua = 0 Mangahao = 0 West Wind =0	North	660 (P2)
	<i>B/B</i>	WIL T8 out of service	Te Apiti =90 Tararua = 0 West Wind =0	South	430 (P2)
	<i>Txs (N-1)</i>	WIL T8 out of service	Te Apiti =90 Tararua = 0 West Wind =0	South	430 (P2)
	<i>Txs (N-1-1)</i>		Te Apiti =0 Tararua = 0 West Wind =0	North	660 (P2)
	<i>Txs (N-1-1)</i>	WIL T8 out of service	Te Apiti =90 Tararua = 160 West Wind =0	South	430 (P2)

South Island

<i>South Island</i>	<i>Study Type</i>	<i>Assets</i>	<i>Local generation</i>	<i>HVDC Flow</i>	<i>HVDC Transfer</i>
Nelson	<i>B/B & Txs</i>	KIK SVC in service	Cobb =0, Argyle =0	North	300 (P2)
Christchurch	<i>B/B & Txs</i>	ISL SVC 2 in service		North	300 (P2)
Westcoast					
Canterbury	<i>B/B & Txs</i>		Highbank = Tekapo A = 0 Opuhua = 0	North	300 (P2)
Otago	<i>B/B & Txs</i>			North	660 (P2)
	<i>B/B & Txs</i>			South	600 (P2)
Southland	<i>B/B & Txs</i>		Roxburgh 110 =0 Waipori 110= 0 White Hill = 0	North	300 (P2)