



Figure 2.12
Reduced primary a.c. system for the South Island of New Zealand

LINE DATA

BUS	NAME	BUS	NAME	RESISTANCE	REACTANCE	SUSCEPTANCE
1	INVERCARG220	3	MANAPOURI220	0.01300	0.09000	0.25000
1	INVERCARG220	3	MANAPOURI220	0.01300	0.09000	0.25000
3	MANAPOURI220	5	TIWAI—220	0.01000	0.10000	0.29000
3	MANAPOURI220	5	TIWAI—220	0.01000	0.10000	0.29000
1	INVERCARG220	5	TIWAI—220	0.00200	0.01000	0.04000
1	INVERCARG220	5	TIWAI—220	0.00200	0.01000	0.04000
1	INVERCARG220	2	ROXBURGH—220	0.01000	0.11000	0.17000
2	ROXBURGH—220	17	TWIZEL—220	0.01600	0.14000	0.24000
2	ROXBURGH—220	17	TWIZEL—220	0.01600	0.14000	0.24000
2	ROXBURGH—220	12	LIVINGSTN220	0.03000	0.12000	0.18000
7	BENMORE—220	17	TWIZEL—220	0.00400	0.03000	0.07000
12	LIVINGSTN220	9	AVIEMORE—220	0.00700	0.03000	0.05000
9	AVIEMORE—220	7	BENMORE—220	0.00400	0.05000	0.02000
9	AVIEMORE—220	7	BENMORE—220	0.00400	0.05000	0.02000
12	LIVINGSTN220	13	ISLINGTON220	0.03000	0.18000	0.35000
17	TWIZEL—220	16	TEKAP0—220	0.00200	0.01000	0.02000
16	TEKAP0—220	13	ISLINGTON220	0.02000	0.13000	0.35000
17	TWIZEL—220	14	BROMLEY—220	0.02000	0.14000	0.45000
14	BROMLEY—220	13	ISLINGTON220	0.00200	0.01000	0.05000
17	TWIZEL—220	13	ISLINGTON220	0.02000	0.14000	0.45000

TRANSFORMER DATA

BUS	NAME	BUS	NAME	RESISTANCE	REACTANCE	TAP	CODE
3	MANAPOURI220	4	MANAPOURI014	0.00060	0.01600	1.000	0
2	ROXBURGH—220	6	ROXBURGH—011	0.00200	0.04000	1.000	0
17	TWIZEL—220	11	OHAU—SYSTEM	0.00400	0.03200	1.000	0
9	AVIEMORE—220	10	AVIEMORE—011	0.00150	0.04500	1.000	0
7	BENMORE—220	8	BENMORE—016	0.00120	0.03200	1.000	0
16	TEKAP0—220	15	TEKAP0—011	0.00300	0.05600	1.000	0

SOLUTION CONVERGED IN 5 P-D AND 5 Q-V ITERATIONS

	LOAD		GENERATION		AC LOSSES		MISMATCH		SHUNTS
	MW	MVAR	MW	MVAR	MW	MVAR	MW	MVAR	MVAR
	2020.00	916.00	2113.71	1420.67	93.92	504.69	-0.21	-0.02	0.00

POWER TRANSFERS

BUS DATA												
BUS	NAME	VOLTS	ANGLE	GENERATION		LOAD		SHUNT	BUS	NAME	MW	MVAR
				MW	MVAR	MW	MVAR	MVAR				
1	INVERCARG220	0.936	-12.26	0.00	0.00	200.00	51.00	0.00	3	MANAPOURI220	-174.88	-40.45
									3	MANAPOURI220	-174.88	-40.45
									5	TIWAI—220	49.34	39.65
									5	TIWAI—220	49.34	39.65
									2	ROXBURGH-220	51.09	-49.40
									MISMATCH		-0.014	-0.004
2	ROXBURGH-220	0.982	-16.02	0.00	0.00	150.00	60.00	0.00	1	INVERCARG220	-50.59	39.24
									17	TIWIZEL—220	184.16	-25.51
									17	TIWIZEL—220	184.16	-25.51
									12	LIVINGSTN220	245.35	-17.18
									6	ROXBURGH-011	-713.14	-31.03
									MISMATCH		0.076	-0.009
3	MANAPOURI220	1.002	-2.84	0.00	0.00	0.00	0.00	0.00	1	INVERCARG220	179.54	49.24
									1	INVERCARG220	179.54	49.24
									5	TIWAI—220	163.87	54.14
									5	TIWAI—220	163.87	54.14
									4	MANAPOURIO14	-686.91	-206.77
									MISMATCH		0.088	-0.003
4	MANAPOURIO14	1.045	3.12	690.00	288.73	0.00	0.00	0.00	3	MANAPOURI220	689.98	288.73
									MISMATCH		0.020	0.000
5	TIWAI—220	0.931	-12.53	0.00	0.00	420.00	185.00	0.00	3	MANAPOURI220	-160.72	-49.83
									3	MANAPOURI220	-160.72	-49.83
									1	INVERCARG220	-49.24	-42.66
									1	INVERCARG220	-49.24	-42.66
									MISMATCH		-0.067	-0.016
6	ROXBURGH-011	1.050	0.000	723.71	242.37	0.00	0.00	0.00	2	ROXBURGH-220	723.71	242.37
									MISMATCH		0.000	0.000
7	BENMORE—220	0.993	-36.85	0.00	0.00	500.00	200.00	0.00	17	TIWIZEL—220	-323.19	6.63
									9	AVIEMORE-220	-88.64	1.28
									9	AVIEMORE-220	-88.64	1.28
									8	BENMORE-016	0.53	-209.19
									MISMATCH		-0.061	-0.005
8	BENMORE-016	1.060	-37.00	0.00	223.40	0.00	0.00	0.00	7	BENMORE-220	0.01	223.40
									MISMATCH		-0.006	0.000
9	AVIEMORE-220	0.996	-34.28	0.00	0.00	0.00	0.00	0.00	12	LIVINGSTN220	21.37	92.02
									7	BENMORE-220	88.96	0.73
									7	BENMORE-220	88.96	0.73
									10	AVIEMORE-011	-199.26	-93.49
									MISMATCH		-0.023	-0.000
10	AVIEMORE-011	1.045	-29.41	200.00	115.46	0.00	0.00	0.00	9	AVIEMORE-220	199.99	115.46
									MISMATCH		0.007	0.000
11	OHAU-SYSTEM	1.050	-25.43	350.00	113.38	0.00	0.00	0.00	17	TIWIZEL—220	350.00	113.38
									MISMATCH		-0.004	0.000

12	LIVINGSTN220	0.966	-34.27	0.00	0.00	150.00	60.00	0.00
13	ISLINGTON220	1.000	-45.17	0.00	437.32	500.00	300.00	0.00
14	BROWLEY—220	0.994	-44.73	0.00	0.00	100.00	60.00	0.00
15	TEKAPO—011	1.008	-26.72	150.00	0.00	0.00	0.00	0.00
16	TEKAPO—220	1.007	-31.47	0.00	0.00	0.00	0.00	0.00
17	TWIZEL—220	1.007	-31.27	0.00	0.00	0.00	0.00	0.00

2	ROXBURGH—220	-226.60	75.10
9	AVIEMORE—220	-20.71	-94.00
13	ISLINGTON220	97.39	-41.11
MISMATCH		-0.082	0.006
12	LIVINGSTN220	-94.14	26.75
16	TEKAPO—220	-176.86	26.13
14	BROWLEY—220	-61.68	67.19
17	TWIZEL—220	-167.23	17.24
MISMATCH		-0.085	0.000
17	TWIZEL—220	-161.84	11.30
13	ISLINGTON220	61.85	-71.30
MISMATCH		-0.009	0.002
16	TEKAPO—220	149.98	0.00
MISMATCH		0.017	-0.000
17	TWIZEL—220	-34.17	5.86
13	ISLINGTON220	183.50	-18.25
15	TEKAPO—011	-149.32	12.39
MISMATCH		-0.007	0.001
2	ROXBURGH—220	-178.50	51.27
2	ROXBURGH—220	-178.50	51.27
7	BENMORE—220	327.44	18.21
16	TEKAPO—220	34.19	-7.77
14	BROWLEY—220	167.37	-17.69
13	ISLINGTON220	173.14	-21.21
11	OHAI—SYSTEM	-345.09	-74.09
MISMATCH		-0.052	0.010

THE MAXIMUM MISMATCH IS 0.0881 MVA ON BUS 3 (MANAPOURI220)
 THE SLACK BUS GENERATION IS 723.709 MW 242.372 MVAR