

APPENDIX 1

DATA FOR IEEE 24 BUS RTS

This IEEE 24-Bus RTS data are taken from <http://www.ee.washington.edu/research/pstca>. The line data and bus data are given in Table A1.1 and A1.2

Table A1.1 Line Data of IEEE 24 – bus RTS

From Bus	To Bus	R (p.u)	X (p.u)	B (p.u)	Thermal Rating (MVA)
1	2	0.0007	0.001231	0.0006514	175
1	3	0.054189	0.211137	0.0613	175
1	5	0.022426	0.084901	0.0244	175
2	4	0.033611	0.127300	0.0366	175
2	6	0.050640	0.192014	0.0557	175
3	9	0.031478	0.119210	0.0343	175
3	24	0.0023	0.0839	0	400
4	9	0.026925	0.107787	0.0279	175
5	10	0.023342	0.088372	0.0254	175
6	10	0.022615	0.033329	0.13029	175
7	8	0.016140	0.061030	0.0179	175
8	9	0.042339	0.164817	0.0478	175
8	10	0.042339	0.164817	0.0478	175
9	11	0.0023	0.0839	0	400

Table A1.1 (Continued)

From Bus	To Bus	R (p.u)	X (p.u)	B (p.u)	Thermal Rating (MVA)
9	12	0.0023	0.0839	0	400
10	11	0.0023	0.0839	0	400
10	12	0.0023	0.0839	0	400
11	13	0.005831	0.047460	0.0959	500
11	14	0.005129	0.041725	0.0843	500
12	13	0.005831	0.04760	0.0959	500
12	23	0.012243	0.096441	0.1984	500
13	23	0.010600	0.086428	0.1752	500
14	16	0.004773	0.038841	0.0785	500
15	16	0.002123	0.17269	0.0349	500
15	21	0.006068	0.048990	0.1006	500
15	21	0.006068	0.048990	0.1006	500
15	24	0.006424	0.051867	0.1066	500
16	17	0.003184	0.025901	0.0523	500
16	19	0.002830	0.023024	0.0465	500
17	18	0.001769	0.014392	0.0291	500
17	22	0.012250	0.105266	0.2116	500
18	21	0.003309	0.025951	0.0533	500
18	21	0.003309	0.025951	0.0533	500
19	20	0.005052	0.039636	0.0814	500
19	20	0.005052	0.039636	0.0814	500
20	23	0.002758	0.021627	0.0444	500
20	23	0.002758	0.021627	0.0444	500
21	22	0.008295	0.067690	0.1367	500

Table A1.2 Bus Data of IEEE 24 – bus RTS

Bus No	Bus type	Voltage p.u	Angle rad	P_d MW	Q_d MVar	P_G MW	Q_G MVar	Q_g
1	SLACK	1	1.03	0.0	0.0	0.0	0	120
2	PV	1.03	0.0	97.0	20.0	67	0	0
7	PV	1.01	0.0	62.0	13.0	64	0	0
13	PV	1.01	0.0	130.0	27.0	200	0	0
14	PV	1.01	0.0	92	20	0.0	0.0	0
15	PV	1.01	0.0	158.0	32.0	274	0	0
16	PV	1.01	0.0	100.0	20.0	245	0	0
18	PV	1.01	0.0	162.0	34.0	144	0	0
21	PV	1.01	0.0	0.0	0.0	294	0	0
22	PV	1.01	0.0	0.0	0.0	150	0	0
23	PV	1.01	0.0	0.0	0.0	200	0	0
3	PQ	1.0	0.0	90	19	0	0.0	0
4	PQ	1.0	0.0	74	15	0.0	0.0	0
5	PQ	1.0	0.0	71	14	0	0.0	0
6	PQ	1.0	0.0	68	14	0.0	0.0	100
8	PQ	1.0	0.0	85	18	0.0	0.0	0
9	PQ	1.0	0.0	175	36	0.0	0.0	0
10	PQ	1.0	0.0	100	23	0.0	0.0	0
19	PQ	1.0	0.0	90	18	0.0	0.0	0
20	PQ	1.0	0.0	65	13	0.0	0.0	0
17	PQ	1.0	0.0	0.0	0.0	0.0	0.0	0
24	PQ	1.0	0.0	0.0	0.0	0.0	0.0	0
11	PQ	1.0	0.0	0.0	0.0	0.0	0.0	0
12	PQ	1.0	0.0	0.0	0.0	0.0	0.0	0

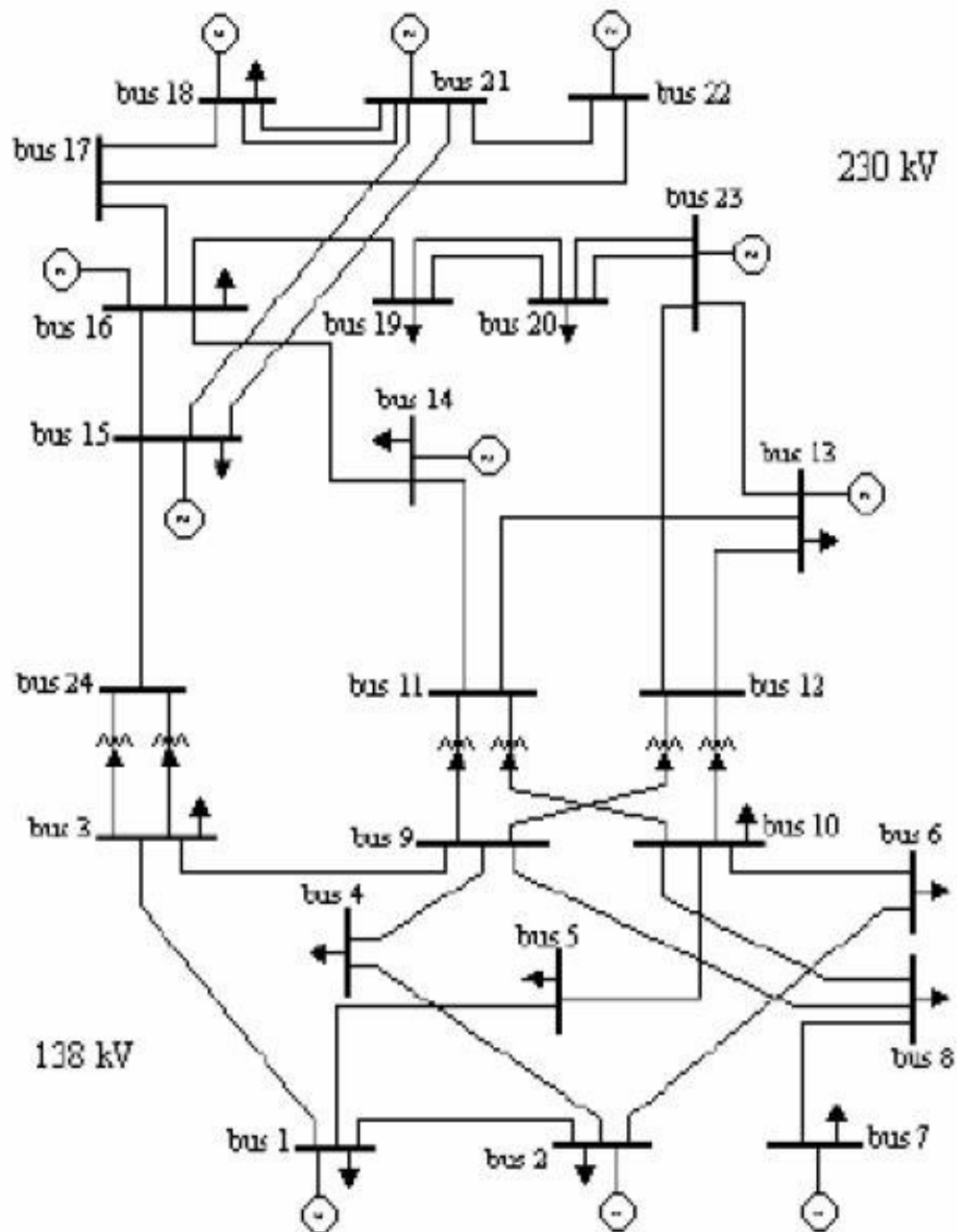


Figure A1.1 Single line Diagram of IEEE-24 bus RTS

APPENDIX 4

Table A4.1 Test Data set - 9

Bus No	Load P	Load Q	Generation MW
1	0	0	0
2	97	20	67
3	45	10	0
4	74	15	0
5	71	14	0
6	34	7	0
7	31	7	64
8	85	18	0
9	87	18	0
10	25	5	0
11	0	0	0
12	0	0	0
13	65	14	100
14	92	20	0
15	79	16	74
16	33	7	45
17	0	0	0
18	81	17	144
19	90	18	0
20	32	7	0
21	0	0	144
22	0	0	150
23	0	0	200
24	0	0	0

Table A4.2 Test Data set - 10

Bus No	Load P	Load Q	Generation MW
1	0	0	0
2	97	20	267
3	45	10	0
4	74	15	0
5	36	7	0
6	68	14	0
7	31	7	64
8	42	9	0
9	43	9	0
10	25	6	0
11	0	0	0
12	0	0	0
13	65	14	100
14	46	10	0
15	79	16	74
16	25	10	65
17	0	0	0
18	81	17	64
19	90	18	0
20	65	13	0
21	0	0	84
22	0	0	80
23	0	0	80
24	0	0	0