

Northern Regional Power Grid (NRPG) Data

Northern Regional Power Grid (NRPG) of Power Grid Corporation of India Limited (PGCIL), is the largest among all five regional power grids in India, comprising of the 9 states. It covers around 30% geographical area and 28% population of India. The reduced NRPG system (220 kV and 400 kV only) network only consists of 246 buses, 376 branches (lines/transformers), 42 generating units and 40 shunt reactors.

Bus Data (in p.u.)

Bus No.	Bus Name	Voltage	P _G	Q _G	P _L	Q _L	Q _{GMAX}	Q _{GMIN}
1	HRDGN2	1.0052	3.852	-0.4175	2.141	0.0754	2.427	-2.0717
2	TNKPR2	1.0319	1.107	0.0132	0	0	0.2130	-0.414
3	CHMRA4	1.0242	3.6	-0.2894	0	0	0.952	-1.8564
4	URIG	1.0353	3.6	-0.1099	0	0	1.545	-1.72
5	BHKRL6	1.032	2	0.3725	0.248	0.082	0.38	-0.74
6	BHKRL2	1.0287	2	-0.1271	0	0	0.38	-0.74
7	BHKRR2	1.0209	5	0.8543	0	0	1.16	-2.2683
8	DEHAR2	1.0499	3.6	0.4218	0	0	0.871	-1.6995
9	SIUL2	1.0377	1.2	0.3395	0	0	0.349	-0.6804
10	DEHAR4	1.0519	3	-1.1329	0	0	0.58	-1.133
11	PONG2	1.0183	3	0.271	0.124	0.041	0.633	-1.2354
12	THEING	0.9952	4	-0.594	0	0	1.465	-1.630
13	ROPAR2	1.0189	10	1.401	0.944	0.298	5.657	-4.8366
14	BHTND2	1.0027	3.6	0.2649	1.771	0.582	1.977	-1.6892
15	BHTND3G	1.0043	3.8	0.1776	0	0	1.884	-1.6096
16	PNIPTW	1.0274	7.2	2.6917	3.057	1.005	3.861	-3.3009
17	BLBGR2	1.0159	1.2	0.505	4.662	1.532	0.809	-0.6898
18	IPST2	1.018	8.75	4.2745	2.216	0.728	4.66	-3.512
19	RAPP2	1.0429	2	0.5666	0	0	1.975	-1.6892
20	RAPPBG	1.0495	3.8	0.5954	0	0	1.971	-1.6935
21	KOTA2	1.0311	7.5	-1.1163	3.862	0.965	3.814	-3.2623
22	SRTGR2	1.0499	4.5	1.2244	1.659	0.549	2.246	-1.9213
23	SRTGRHG	1.039	4.5	-1.9233	0	0	2.257	-1.9235
24	NAPP2	1.0127	3	0.5921	0	0	2.112	-1.8041
25	SALAL2	1.0203	4.5	-0.6983	0	0	1.013	-1.9756
26	PRCHA2	1.0329	1.6	0.5433	1.64	0.539	0.989	-0.8446
27	PANKI2	1.0249	1.4	-0.4024	3.016	1.254	0.989	-0.8446
28	OBRA2	1.05	4	1.8732	-0.432	0.209	2.022	-1.7311
29	TANDA2	1.0368	2.6	1.483	0	0	1.483	-1.2668
30	MNRBL2	1.04	0.6	0.106	0	0	0.106	-0.2070
31	CHIBR2	1.0248	1.74	0.3171	0	0	0.317	-0.6180
32	ANPRA4	1.035	14	-0.213	0	0	7.321	-6.2647
33	OBRA4	1.03	8	-2.3954	0	0	4.494	-3.8415
34	BTTP2	1.0188	5.5	3.0559	0	0	3.234	-2.7658
35	FRDBDG	1.0243	3.6	0.9468	0	0	1.605	-1.5779
36	AURYA2	1.0499	5.8	0.0376	0	0	3.948	-2.7847
37	ANTA2	1.0499	3.6	0.9789	0	0	1.854	-1.5846
38	DADRI	1.0447	15	1.6075	0	0	7.441	-6.3594
39	UNCHR2	1.0486	7.2	1.3595	0	0	3.769	-3.2214
40	SNGRL4	1.038	18	-4.0049	0	0	8.988	-15.360
41	RIHND4	1.0475	9	-3.9419	12.584	-6.34	4.689	-3.9490
42	BHABA1	1.0256	2.4	0.4335	0	0	0	0

43	MSAHIB	1.0089	0	0	0.425	0.197	0	0
44	HRNGR	1.0094	0	0	0.556	0.165	0	0
45	BURN	1.0111	0	0	0.628	0.219	0	0
46	UDMPR2	1.0163	0	0	0.71	0.173	0	0
47	SAHUPURI	0.9815	0	0	1.45	0.844	0	0
48	SAR-NR	0.9909	0	0	0.958	0.576	0	0
49	ZANKOT2	1.0344	0	0	0.36	0.261	0	0
50	ALISTG2	1.0342	0	0	-0.155	0.307	0	0
51	AMRGRH2	1.0376	0	0	0	0	0	0
52	LASIPR2	1.0356	0	0	0.489	0.121	0	0
53	ABDPR2	1.0279	0	0	0	0	0	0
54	WAGORA2	1.0364	0	0	0	0	0	0
55	SRNGR2	1.0363	0	0	0.435	-0.063	0	0
56	KRIPR2	1.0203	0	0	0	0	0	0
57	JAMMU2	1.012	0	0	1.426	0.217	0	0
58	NALAGARH	1.0456	0	0	0	0	0	0
59	VARNASI	1.0037	0	0	0	0.57	0	0
60	JESRE2	1.0181	0	0	1.102	0.265	0	0
61	ABDPR4	1.0279	0	0	0	0	0	0
62	WAGORA4	1.0378	0	0	0	0	0	0
63	NALGRH4	1.0456	0	0	0	0	0	0
64	JLNDRB	0.9945	0	0	0.496	0.163	0	0
65	GNGWL2	1.0233	0	0	0.127	0.055	0	0
66	SNGRR2	0.9972	0	0	1.489	0.49	0	0
67	LUDINB	0.9944	0	0	4.271	1.172	0	0
68	ABDLPB	1.0068	0	0	-0.43	0.168	0	0
69	BHIWN4	1.0256	0	0	0	0	0	0
70	HISAR4	1.0285	0	0	0	0	0	0
71	KISPUR4	1.0298	0	0	0	0	0	0
72	MOGA4	1.013	0	0	0	0	0	0
73	JLNDHP4	1.0151	0	0	0	0	0	0
74	JLNDHP	0.9989	0	0	0	0	0	0
75	HUMBR2	0.9906	0	0	0	0	0	0
76	GORYA2	0.9854	0	0	0.724	0.315	0	0
77	GIRI2	1.0146	0	0	1.81	0.306	0	0
78	JGRON2	0.9976	0	0	0.291	0.066	0	0
79	MHLPR2	0.9992	0	0	1.397	0.418	0	0
80	SARNA2	0.9938	0	0	0	0	0	0
81	DHURI	1.0005	0	0	0	0	0	0
82	BATLA2	0.975	0	0	2.81	0.935	0	0
83	AMRTS2	0.9658	0	0	2.986	1.173	0	0
84	MOGA2	1.0017	0	0	4.662	1.757	0	0
85	PATTI2	0.9617	0	0	2.634	0.866	0	0
86	DASUA2	1.0048	0	0	0	0	0	0
87	RAJPR2	0.9973	0	0	1.401	0.46	0	0
88	JLNDRP	0.9913	0	0	4.095	1.612	0	0
89	KTKPR2	0.9995	0	0	0.387	0.127	0	0
90	GOBIN2	1.0042	0	0	2.534	0.833	0	0
91	LALTN2	0.9942	0	0	1.773	0.583	0	0

92	FATGRH2	0.9676	0	0	0.65	0.214	0	0
93	MUKTSR	0.9955	0	0	1.411	0.464	0	0
94	SLTNPP	0.9797	0	0	0.537	0.176	0	0
95	CLAMRS2	0.9652	0	0	0.65	0.214	0	0
96	PATIL2	0.9968	0	0	1.66	0.546	0	0
97	MLRKT2	1.001	0	0	1.708	0.561	0	0
98	BRNLA2	0.996	0	0	1.136	0.373	0	0
99	MANSA2	0.9996	0	0	0.65	0.214	0	0
100	MOHLI2	1.0072	0	0	1.231	0.405	0	0
101	SUNAM2	0.9989	0	0	0.65	0.214	0	0
102	BUTARI	0.9796	0	0	0	0	0	0
103	TARANTRN	0.9639	0	0	0	0	0	0
104	KAPURT2	0.9831	0	0	0	0	0	0
105	PNHKL2	0.9901	0	0	0.701	0.23	0	0
106	SHABD2	0.9878	0	0	0.46	0.151	0	0
107	TEPLA	0.9888	0	0	0	0	0	0
108	PIPLI2	1.0006	0	0	1.235	0.406	0	0
109	PNPTS	1.0252	0	0	1.401	0.461	0	0
110	AMBLA2	1.0253	0	0	0.573	0.188	0	0
111	REWRI2	1.003	0	0	0.637	0.209	0	0
112	NRNAL2	0.9779	0	0	1.21	0.398	0	0
113	NRWNA2	1.012	0	0	1.095	0.36	0	0
114	KATHL2	1.0062	0	0	0.683	0.224	0	0
115	BHIWN2	1.0151	0	0	0.599	0.197	0	0
116	GRGON2	1.0096	0	0	1.115	0.366	0	0
117	PALLA2	1.0171	0	0	1.302	0.428	0	0
118	HISAR2	1.0151	0	0	1.821	0.552	0	0
119	ASHDMP	1.0166	0	0	0.528	0.173	0	0
120	SIRSA2	1.0028	0	0	0.6	0.213	0	0
121	DADRI2	1.0068	0	0	2.318	0.762	0	0
122	MHNDGR2	0.9967	0	0	0	0	0	0
123	YMNGR2	0.9698	0	0	1.656	0.544	0	0
124	LDWAH2	1.0077	0	0	0.36	0.118	0	0
125	NISSNG2	1.01	0	0	0.705	0.232	0	0
126	FATBD2	1.0127	0	0	0	0	0	0
127	JIND2	1.013	0	0	0.475	0.156	0	0
128	DRHR22	1.0046	0	0	0.348	0.114	0	0
129	HISARH	1.0167	0	0	0	0	0	0
130	PEHOW2	1.0013	0	0	0.348	0.114	0	0
131	PNPT4	1.0352	0	0	0	0	0	0
132	NREL2D	1.0061	0	0	2.552	0.839	0	0
133	PTPNG2	1.0135	0	0	2.202	0.724	0	0
134	IPEXT2	1.0171	0	0	0.743	0.244	0	0
135	OKHLA2	1.0177	0	0	0.883	0.29	0	0
136	MHRLI2	1.0099	0	0	3.239	1.065	0	0
137	NGARH2	1.0045	0	0	3.323	1.092	0	0
138	VKUNJ2	1.0093	0	0	0.701	0.23	0	0
139	MANDL2	1.0102	0	0	1.234	0.406	0	0
140	BAWAN2	1.0072	0	0	0.477	0.157	0	0

141	BAMNL2	1.0097	0	0	0.855	0.281	0	0
142	SBJMDI	1.007	0	0	0.715	0.235	0	0
143	SBAGH2	1.0036	0	0	1.36	0.447	0	0
144	ROHINI	1.0035	0	0	1.655	0.544	0	0
145	BURARI	1.0071	0	0	2.005	0.659	0	0
146	PKSTRT	1.0135	0	0	0.92	0.302	0	0
147	MRBAG2	1.0167	0	0	0	0	0	0
148	NRAINA	1.0106	0	0	0.91	0.299	0	0
149	RHTKRD	1.0003	0	0	1.276	0.419	0	0
150	SVIHR2	1.0177	0	0	1.192	0.392	0	0
151	DKUAN2	1.0087	0	0	0.68	0.223	0	0
152	KGATE2	1.0073	0	0	0.968	0.318	0	0
153	LODRD2	1.0159	0	0	0.743	0.244	0	0
154	BAWANA	1.0247	0	0	0	0	0	0
155	BAMNL4	1.022	0	0	0	0	0	0
156	BHIWD2	0.8723	0	0	2.698	0.887	0	0
157	RTNGR2	1.0308	0	0	0.835	0.275	0	0
158	ALWAR2	0.9128	0	0	1.747	0.624	0	0
159	BRTPR2	0.9824	0	0	0.799	0.263	0	0
160	JAPUR2	0.9986	0	0	2.532	0.832	0	0
161	RNGSI2	1.0019	0	0	0.968	0.318	0	0
162	KETRI2	0.9999	0	0	2.094	0.688	0	0
163	AJMER2	0.9683	0	0	1.235	0.406	0	0
164	PHULR2	0.9835	0	0	0.884	0.29	0	0
165	BHLWR2	1.008	0	0	0.508	0.183	0	0
166	BEWAR2	0.9948	0	0	1.381	0.459	0	0
167	BEAWRNEW	0.9953	0	0	0	0	0	0
168	UDPUR2	0.978	0	0	2.3	0.888	0	0
169	NMBHR2	0.9926	0	0	1.189	0.338	0	0
170	CHTRG2	0.9992	0	0	1.336	0.469	0	0
171	SIRON2	0.9535	0	0	1.375	0.469	0	0
172	HINDAN	0.9576	0	0	0.945	0.342	0	0
173	BILARA	0.9407	0	0	0.486	0.183	0	0
174	JDHPR2	0.9133	0	0	1.698	0.676	0	0
175	BARSNSR	1.0371	0	0	0	0	0	0
176	SIKAR2	1.0085	0	0	1.38	0.454	0	0
177	BIKNR2	1.0273	0	0	0.593	0.195	0	0
178	BNSWR2	1.0062	0	0	-0.71	-0.106	0	0
179	JAPRR4	1.007	0	0	0	0	0	0
180	RTNGRH4	1.0355	0	0	0	0	0	0
181	DAUSA2	0.9876	0	0	0.714	0.235	0	0
182	SHIBD2	1.0096	0	0	1.147	0.377	0	0
183	KONDLI	1.0131	0	0	0	0	0	0
184	NHTUR2	0.9947	0	0	0.258	0.114	0	0
185	RISHK2	1.0245	0	0	0.8	0.287	0	0
186	SHJNP2	1.0044	0	0	0.43	0.096	0	0
187	BERLI2	1.0176	0	0	2.2	0.216	0	0
188	SITPR2	0.9741	0	0	1.524	0.556	0	0
189	BADAUN2	1.0137	0	0	0.281	0.092	0	0

190	LKNOW2	1.0093	0	0	4.079	1.198	0	0
191	MURBD2	1.0098	0	0	1.231	0.351	0	0
192	SIMBL2	0.9856	0	0	0.86	0.283	0	0
193	MERUT2	0.9865	0	0	1.528	0.616	0	0
194	MRDNG2	1.0057	0	0	2.687	1.292	0	0
195	SHMLI2	0.989	0	0	1.974	0.671	0	0
196	SHRNP2	1.0043	0	0	-0.131	0.252	0	0
197	MZFRN2	0.9895	0	0	1.807	0.613	0	0
198	KURJA2	1.0026	0	0	1.853	0.535	0	0
199	AGRA2	0.9895	0	0	3.283	1.093	0	0
200	FRZBD2	0.9908	0	0	0.49	0.161	0	0
201	MAINP2	1.0026	0	0	2.111	0.694	0	0
202	ALBAD2	1.0048	0	0	2.375	0.813	0	0
203	FATPR2	1.035	0	0	1.388	0.222	0	0
204	AZMGR2	0.9973	0	0	0.889	0.347	0	0
205	SLTNP2	1.0002	0	0	3.646	1.237	0	0
206	BASTI2	1.0212	0	0	0.388	0.127	0	0
207	GRKPR2	1.0051	0	0	1.277	0.646	0	0
208	KASHPR2	1.0007	0	0	1.147	0.552	0	0
209	RISHK4	1.0292	0	0	0	0	0	0
210	BERLY4	1.0178	0	0	0	0	0	0
211	LKNOW4	1.0144	0	0	0	0	0	0
212	MURBD4	1.0217	0	0	0	0	0	0
213	MRDNG4	1.0242	0	0	0	0	0	0
214	AGRAUP	0.9954	0	0	0	0	0	0
215	PANKI4	1.0335	0	0	0	0	0	0
216	AZMGR4	0.9998	0	0	0	0	0	0
217	SLTNP4	1.0036	0	0	0	0	0	0
218	MAUUP	1.002	0	0	1.595	0.368	0	0
219	KUDRI2	1.0233	0	0	-0.662	-0.208	0	0
220	BARAT2	0.9898	0	0	0.95	0.312	0	0
221	UNNAO4	1.0239	0	0	0	0	0	0
222	UNNAO2	1.0212	0	0	0	0	0	0
223	RAIBRL	1.0387	0	0	0.78	0.256	0	0
224	BANDA2	1.0275	0	0	0.357	0.117	0	0
225	PHLPR2	0.9972	0	0	0.7	0.23	0	0
226	JAWHPR2	1.0062	0	0	0	0	0	0
227	CHINHT	1.0123	0	0	0.75	0.247	0	0
228	NOIDA2	1.0049	0	0	0.92	0.302	0	0
229	BLBGN2	1.0178	0	0	0	0	0	0
230	JAIPRP2	1.0008	0	0	0	0	0	0
231	KANPUR2	1.0337	0	0	0	0	0	0
232	HISARP	1.019	0	0	0	0	0	0
233	BLBGR4	1.0293	0	0	0	0	0	0
234	AGRA4	1.045	0	0	0	0	0	0
235	DADRI4	1.0411	0	0	-12.584	-7	0	0
236	MLRKT4	1.0058	0	0	0	0	0	0
237	AURYA4	1.0536	0	0	0	0	0	0
238	JAPRN4	1.0096	0	0	0	0	0	0

239	KNPRN4	1.0344	0	0	0	0	0	0
240	MANDLA	1.0276	0	0	0	0	0	0
241	ALAHABAD	1.0559	0	0	0	0	0	0
242	KOTLA	0.9725	0	0	0.277	0.091	0	0
243	KOTLA	1.016	0	0	0	0	0	0
244	KASHANG2	1.0186	0	0	0	0	0	0
245	KHNR2	0.9864	0	0	2.007	0.996	0	0
246	HMRPR2	1.0037	0	0	-0.07	0.108	0	0

**Line data
(in p.u.)**

Line No.	From	To	Resistance (R)	Reactance (X)	Suseptance (B _{SH}) (full)	Tap	Line Rating	Circuits
1	59	48	0	0.0125	0	1	1	S
2	61	53	0	0.0125	0	1	1	S
3	62	54	0	0.0125	0	1	1	S
4	71	56	0	0.0125	0	1	1	S
5	6	5	0	0.0125	0	1	1	S
6	10	8	0	0.0125	0	1	1	S
7	69	115	0	0.0125	0	1	1	S
8	70	232	0	0.0125	0	1	1	S
9	72	84	0	0.0125	0	1	1	S
10	72	84	0	0.00625	0	1	2	S
11	72	84	0	0.00417	0	1	3	S
12	73	74	0	0.0125	0	1	1	S
13	236	97	0	0.0125	0	1	1	S
14	131	109	0	0.0125	0	1	1	S
15	240	139	0	0.0125	0	1	1	S
16	154	140	0	0.0125	0	1	1	S
17	155	141	0	0.0125	0	1	1	S
18	180	157	0	0.0125	0	1	1	S
19	179	160	0	0.0125	0	1	1	S
20	23	22	0	0.0125	0	1	1	S
21	209	185	0	0.0125	0	1	1	S
22	210	187	0	0.0125	0	1	1	S
23	211	190	0	0.0125	0	1	1	S
24	212	191	0	0.0125	0	1	1	S
25	213	194	0	0.0125	0	1	1	S
26	214	199	0	0.0125	0	1	1	S
27	215	27	0	0.0125	0	1	1	S
28	33	28	0	0.0125	0	1	1	S
29	216	204	0	0.0125	0	1	1	S
30	217	205	0	0.0125	0	1	1	S
31	221	222	0	0.0125	0	1	1	S
32	233	229	0	0.0125	0	1	1	S
33	238	230	0	0.0125	0	1	1	S
34	239	231	0	0.0125	0	1	1	S
35	237	36	0	0.0125	0	1	1	S
36	235	38	0	0.0125	0	1	1	S
37	43	44	0.0035	0.01855	0.1278	0	4	D
38	43	45	0.0035	0.01855	0.1278	0	4	D
39	44	56	0.00464	0.02475	0.1704	0	4	D
40	44	57	0.0071	0.0379	0.0653	0	2	S
41	44	80	0.0071	0.0379	0.0653	0	2	S

42	45	56	0.00619	0.03299	0.2272	0	4	D
43	46	56	0.00155	0.00825	0.0568	0	4	D
44	46	57	0.0077	0.0412	0.071	0	2	S
45	46	80	0.0192	0.1023	0.1761	0	2	S
46	47	48	0.00155	0.00825	0.0142	0	1.8	S
47	59	48	0	0.052	0	0	2.4	S
48	48	204	0.0161	0.0858	0.1477	0	2	S
49	49	50	0.00154	0.00825	0.0568	0	4	D
50	49	54	0.00132	0.00701	0.04828	0	4	D
51	50	55	0.00232	0.01238	0.0852	0	4	D
52	51	54	0.00348	0.01856	0.1278	0	4	D
53	52	54	0.00077	0.00413	0.0284	0	4	D
54	54	55	0.00038	0.00206	0.0142	0	4	D
55	55	56	0.01455	0.07755	0.534	0	4	D
56	56	25	0.00232	0.01238	0.3408	0	9	Q
57	56	80	0.0081	0.0433	0.2982	0	4	D
58	25	57	0.00479	0.02557	0.17608	0	0	D
59	2	187	0.0075	0.04315	0.301	0	4	D
60	63	58	0	0.0198	0	0	6.3	S
61	59	32	0.00149	0.0166	1.776	0	11	D
62	59	216	0.0019	0.0207	0.555	0	5.5	S
63	3	71	0.00186	0.02075	0.555	0	5.5	S
64	3	73	0.00155	0.0173	1.8538	0	11	D
65	4	62	0.00086	0.00965	1.0323	0	11	D
66	61	154	0.00101	0.01439	2.2514	0	16	D
67	62	71	0.00174	0.0194	2.0757	0	11	D
68	63	70	0.00151	0.02137	3.3434	0	16	D
69	6	65	0.00123	0.0066	0.1023	0	6	T
70	7	65	0.00195	0.0103	0.071	0	4	D
71	7	67	0.00665	0.03545	0.2442	0	4	D
72	7	79	0.00395	0.02105	0.1448	0	4	D
73	7	105	0.01733	0.09239	0.15904	0	2	S
74	8	65	0.00435	0.0231	0.159	0	4	D
75	64	67	0.00485	0.026	0.179	0	4	D
76	64	11	0.00507	0.02693	0.4176	0	6	T
77	64	88	0.0011	0.00575	0.0398	0	4	D
78	64	102	0.00773	0.04124	0.071	0	2	S
79	9	11	0.0149	0.0792	0.1363	0	2	S
80	9	60	0.00928	0.04949	0.0852	0	2	S
81	65	67	0.00605	0.03215	0.2216	0	4	D
82	65	68	0.0248	0.132	0.2272	0	2	S
83	65	90	0.00605	0.03215	0.2216	0	4	D
84	65	100	0.00555	0.0297	0.2044	0	4	D
85	65	110	0.00867	0.0462	0.31808	0	4	D
86	66	67	0.00605	0.03215	0.2216	0	4	D
87	66	98	0.0054	0.0289	0.0497	0	2	S
88	66	118	0.0088	0.047	0.3238	0	4	D

89	66	130	0.00541	0.02887	0.1988	0	4	D
90	67	91	0.00155	0.00825	0.0568	0	4	D
91	68	108	0.0074	0.0396	0.0386	0	2	D
92	10	69	0.0065	0.0726	1.9425	0	5.5	S
93	10	131	0.0048	0.0533	1.4263	0	5.5	S
94	69	70	0.0007	0.0073	0.1943	0	5.5	S
95	69	154	0.0023	0.0259	0.6937	0	5.5	S
96	70	72	0.00195	0.0218	2.331	0	11	D
97	70	154	0.003	0.0332	0.888	0	5.5	S
98	70	238	0.0052	0.0581	1.554	0	5.5	S
99	71	72	0.00105	0.02375	3.8058	0	0	D
100	72	73	0.00065	0.00725	0.777	0	11	D
101	74	86	0.00885	0.02353	0.1618	0	4	D
102	74	88	0.00109	0.00577	0.03976	0	4	D
103	74	104	0.00348	0.01856	0.1278	0	4	D
104	74	246	0.01006	0.05362	0.3692	0	4	D
105	75	76	0.0023	0.01235	0.0852	0	4	D
106	75	91	0.00195	0.0103	0.071	0	4	D
107	78	84	0.00265	0.014	0.0966	0	4	D
108	78	91	0.0025	0.0132	0.0908	0	4	D
109	79	88	0.00365	0.0194	0.1334	0	4	D
110	11	86	0.0065	0.0346	0.0596	0	2	S
111	11	60	0.00696	0.03712	0.0639	0	2	S
112	80	82	0.00147	0.00784	0.48564	0	12	H
113	80	12	0.00139	0.00743	0.20448	0	8	Q
114	80	86	0.0045	0.0239	0.1648	0	4	D
115	81	97	0.00232	0.01238	0.0852	0	4	D
116	81	101	0.00232	0.01238	0.0852	0	4	D
117	82	83	0.0031	0.0165	0.1136	0	4	D
118	82	92	0.0027	0.01444	0.0994	0	4	D
119	83	95	0.00194	0.01031	0.071	0	4	D
120	83	102	0.00634	0.03382	0.05822	0	2	S
121	83	103	0.00155	0.00825	0.0568	0	4	D
122	83	104	0.00348	0.01856	0.1278	0	4	D
123	84	89	0.0035	0.01855	0.1278	0	4	D
124	84	94	0.0068	0.0363	0.0625	0	2	S
125	85	94	0.0031	0.0165	0.1136	0	4	D
126	85	103	0.00155	0.00825	0.0568	0	4	D
127	87	96	0.00232	0.01238	0.0852	0	4	D
128	87	100	0.0027	0.01444	0.0994	0	4	D
129	88	13	0.0081	0.0433	0.2982	0	4	D
130	88	94	0.00315	0.0169	0.1164	0	4	D
131	89	93	0.0027	0.01445	0.0994	0	4	D
132	89	15	0.00426	0.02269	0.1562	0	4	D
133	13	90	0.00243	0.013	0.358	0	8	Q
134	13	91	0.0071	0.03795	0.2612	0	4	D
135	13	100	0.00356	0.01897	0.13064	0	4	D

136	90	96	0.0025	0.0132	0.0908	0	4	D
137	90	97	0.00365	0.0194	0.1334	0	4	D
138	91	97	0.0097	0.052	0.0895	0	2	S
139	92	95	0.00194	0.01031	0.071	0	4	D
140	93	14	0.00385	0.0206	0.142	0	4	D
141	96	101	0.00696	0.03712	0.2556	0	4	D
142	97	98	0.0085	0.0454	0.0781	0	2	S
143	98	15	0.00465	0.02475	0.1704	0	4	D
144	14	15	0.00116	0.00619	0.0426	0	4	D
145	15	99	0.00332	0.01774	0.12212	0	4	D
146	99	101	0.00325	0.01733	0.11928	0	4	D
147	105	107	0.00503	0.02681	0.1846	0	4	D
148	105	245	0.00534	0.02846	0.19596	0	4	D
149	106	107	0.00116	0.00619	0.0426	0	4	D
150	106	123	0.00402	0.02144	0.14768	0	4	D
151	106	130	0.0031	0.0165	0.1136	0	4	D
152	108	109	0.0108	0.0577	0.0994	0	2	S
153	109	16	0.00042	0.00228	0.0624	0	8	Q
154	109	110	0.00967	0.05155	0.355	0	4	D
155	109	121	0.017	0.0907	0.1562	0	2	S
156	109	132	0.00299	0.01595	0.24708	0	6	T
157	16	113	0.0059	0.03135	0.2158	0	4	D
158	16	125	0.0031	0.0165	0.1136	0	4	D
159	111	121	0.0091	0.0487	0.0838	0	2	S
160	111	128	0.00155	0.00825	0.0568	0	4	D
161	112	122	0.00557	0.0297	0.05112	0	2	S
162	113	114	0.00285	0.01525	0.105	0	4	D
163	113	126	0.01006	0.05362	0.0923	0	2	S
164	113	127	0.00348	0.01856	0.1278	0	4	D
165	113	129	0.0093	0.0495	0.0852	0	2	S
166	114	125	0.0031	0.0165	0.1136	0	4	D
167	114	130	0.0023	0.01235	0.0852	0	4	D
168	115	118	0.0045	0.0239	0.1648	0	4	D
169	115	121	0.00135	0.00722	0.1988	0	8	Q
170	116	128	0.0031	0.0165	0.1136	0	4	D
171	116	229	0.00185	0.0099	0.0682	0	4	D
172	17	121	0.0181	0.09651	0.16614	0	2	S
173	17	229	0.00026	0.00137	0.0213	0	6	T
174	17	34	0.00185	0.0099	0.0682	0	4	D
175	117	119	0.00115	0.0062	0.0426	0	4	D
176	117	35	0.00194	0.01031	0.071	0	4	D
177	118	129	0.0008	0.0041	0.0071	0	2	S
178	118	162	0.0178	0.0949	0.1633	0	2	S
179	118	232	0.0011	0.00575	0.0398	0	4	D
180	119	229	0.00154	0.00825	0.0568	0	4	D
181	120	126	0.00619	0.033	0.0568	0	2	S
182	121	122	0.00325	0.01733	0.11928	0	4	D

183	121	162	0.00649	0.03465	0.23856	0	4	D
184	121	229	0.01779	0.09486	0.1633	0	2	S
185	124	125	0.00372	0.0198	0.13632	0	4	D
186	125	130	0.0031	0.0165	0.1136	0	4	D
187	126	129	0.00464	0.02475	0.1704	0	4	D
188	127	129	0.00503	0.02681	0.1846	0	4	D
189	129	232	0.00075	0.0041	0.0284	0	4	D
190	132	139	0.00215	0.01155	0.0796	0	4	D
191	132	140	0.00095	0.00495	0.034	0	4	D
192	132	149	0.0017	0.00905	0.0624	0	4	D
193	133	18	0.0003	0.00165	0.0114	0	4	D
194	133	139	0.0011	0.00575	0.0398	0	4	D
195	133	182	0.0012	0.0066	0.0114	0	2	S
196	133	183	0.0002	0.0008	0.0014	0	2	S
197	18	134	0.0001	0.0004	0.0028	0	4	D
198	134	146	0.00045	0.00245	0.017	0	4	D
199	134	147	0.001	0.00535	0.037	0	4	D
200	135	34	0.00045	0.00245	0.017	0	4	D
201	136	138	0.0004	0.00205	0.0142	0	4	D
202	136	141	0.0011	0.00575	0.0398	0	4	D
203	136	229	0.0023	0.01235	0.0852	0	4	D
204	136	34	0.0013	0.007	0.0482	0	4	D
205	137	140	0.0017	0.00905	0.0624	0	4	D
206	137	141	0.0007	0.0037	0.0256	0	4	D
207	138	141	0.00031	0.00165	0.01136	0	4	D
208	138	151	0.00055	0.0029	0.0198	0	4	D
209	139	145	0.00055	0.0029	0.0198	0	4	D
210	139	152	0.0007	0.0037	0.0256	0	4	D
211	140	143	0.00095	0.00495	0.034	0	4	D
212	140	144	0.00085	0.00455	0.0312	0	4	D
213	141	148	0.00031	0.00165	0.01136	0	4	D
214	141	151	0.0014	0.0074	0.0512	0	4	D
215	142	145	0.00055	0.0029	0.0198	0	4	D
216	142	152	0.00025	0.00125	0.0086	0	4	D
217	143	144	0.00045	0.00245	0.017	0	4	D
218	146	148	0.00055	0.0029	0.0198	0	4	D
219	147	150	0.00075	0.0041	0.0284	0	4	D
220	147	153	0.0004	0.00205	0.0142	0	4	D
221	150	34	0.00025	0.00125	0.0086	0	4	D
222	154	155	0.00015	0.0026	0.439	0	4	D
223	154	240	0.00015	0.00195	0.3326	0	4	D
224	181	158	0.0131	0.0701	0.1207	0	2	S
225	181	172	0.01083	0.05774	0.0994	0	2	S
226	181	230	0.0024	0.0125	0.086	0	4	D
227	181	37	0.01701	0.09074	0.6248	0	0	D
228	156	158	0.00465	0.02475	0.1704	0	4	D
229	19	21	0.00385	0.0206	0.142	0	4	D

230	19	169	0.0223	0.1188	0.2045	0	2	S
231	20	21	0.00773	0.04124	0.071	0	2	S
232	20	168	0.03496	0.18643	0.32092	0	2	S
233	20	170	0.01291	0.06888	0.47428	0	4	D
234	20	37	0.01702	0.09074	0.1562	0	2	S
235	157	162	0.0192	0.1023	0.1761	0	2	S
236	157	175	0.0232	0.1237	0.213	0	2.2	S
237	157	176	0.00413	0.022	0.3408	0	6	T
238	157	177	0.0221	0.118	0.2031	0	2	S
239	157	22	0.01315	0.07011	0.4828	0	4	D
240	158	160	0.0183	0.0973	0.1676	0	2	S
241	158	34	0.0227	0.1213	0.2087	0	2	S
242	159	199	0.0037	0.0198	0.1364	0	4	D
243	160	161	0.0048	0.02555	0.176	0	4	D
244	160	162	0.0102	0.05445	0.3748	0	4	D
245	160	164	0.00485	0.026	0.179	0	4	D
246	160	21	0.01087	0.05803	0.8988	0	6	T
247	160	230	0.0024	0.0125	0.086	0	4	D
248	161	162	0.0131	0.0701	0.1207	0	2	S
249	161	176	0.00284	0.01512	0.2343	0	6	T
250	163	164	0.013	0.0693	0.1193	0	2	S
251	163	167	0.0147	0.07837	0.1349	0	2	S
252	165	21	0.01045	0.0557	0.3834	0	4	D
253	165	167	0.01315	0.07012	0.1207	0	2	S
254	165	170	0.0087	0.0462	0.0795	0	2	S
255	165	171	0.0316	0.1683	0.2897	0	2	S
256	165	174	0.0328	0.1749	0.301	0	2	S
257	165	37	0.0139	0.07425	0.5112	0	4	D
258	166	21	0.0156	0.0833	0.5736	0	4	D
259	166	167	0.00464	0.02475	0.1704	0	4	D
260	166	173	0.01392	0.07424	0.1278	0	2	S
261	166	175	0.01934	0.10311	0.71	0	4	D
262	21	37	0.00385	0.0206	0.142	0	4	D
263	168	169	0.017	0.0907	0.1562	0	2	S
264	168	170	0.0173	0.0924	0.159	0	2	S
265	168	171	0.0153	0.0817	0.1406	0	2	S
266	168	178	0.0119	0.0635	0.4374	0	4	D
267	169	170	0.0062	0.033	0.0568	0	2	S
268	173	174	0.01083	0.05774	0.0994	0	2	S
269	175	177	0.0247	0.1319	0.2272	0	2.2	S
270	179	238	0.0003	0.0031	0.333	0	11	D
271	23	180	0.00153	0.01712	1.8315	0	11	D
272	24	191	0.0139	0.0742	0.1278	0	2	S
273	24	192	0.0122	0.0652	0.1122	0	2	S
274	24	198	0.0035	0.01855	0.1278	0	4	D
275	24	1	0.0054	0.0289	0.0497	0	2	S
276	182	183	0.0011	0.0058	0.0099	0	2	S

277	182	194	0.00185	0.0099	0.0682	0	4	D
278	182	228	0.0039	0.0206	0.0355	0	2	S
279	183	194	0.00433	0.0231	0.03976	0	2	S
280	183	34	0.0031	0.0165	0.0284	0	2	S
281	184	191	0.0105	0.0561	0.0966	0	2	S
282	184	197	0.00773	0.04124	0.071	0	0	T
283	185	197	0.00696	0.03712	0.2556	0	0	D
284	185	30	0.0081	0.0433	0.2982	0	4	D
285	185	219	0.0127	0.0676	0.1164	0	2	S
286	186	187	0.0064	0.03425	0.2358	0	4	D
287	186	188	0.0145	0.0775	0.1335	0	2	S
288	187	189	0.0064	0.03425	0.05895	0	2	S
289	187	191	0.00695	0.0371	0.2556	0	4	D
290	188	190	0.0149	0.0792	0.1363	0	2	S
291	190	222	0.0031	0.0165	0.1136	0	4	D
292	190	223	0.0093	0.0495	0.0852	0	2	S
293	190	227	0.0046	0.0247	0.0426	0	2	S
294	191	208	0.00232	0.01238	0.0852	0	4	D
295	192	193	0.0071	0.0379	0.0653	0	2	S
296	193	194	0.0071	0.0379	0.0653	0	2	S
297	193	197	0.00187	0.0099	0.1533	0	6	T
298	194	195	0.0124	0.066	0.1136	0	2	S
299	194	198	0.0054	0.02885	0.1988	0	4	D
300	194	220	0.0063	0.0338	0.0582	0	2	S
301	194	228	0.00077	0.00413	0.0284	0	4	D
302	195	196	0.00535	0.02845	0.196	0	4	D
303	195	197	0.00295	0.01565	0.108	0	4	D
304	195	220	0.0062	0.033	0.0568	0	2	S
305	196	219	0.00625	0.0334	0.23	0	4	D
306	198	1	0.0035	0.01855	0.1278	0	4	D
307	1	199	0.0152	0.0808	0.1392	0	2	S
308	1	226	0.0058	0.03095	0.213	0	4	D
309	199	200	0.0046	0.0247	0.0426	0	2	S
310	199	36	0.0144	0.0767	0.5282	0	4	D
311	200	201	0.0087	0.0462	0.0795	0	2	S
312	201	26	0.0165	0.08785	0.605	0	4	D
313	201	226	0.00465	0.02475	0.1704	0	4	D
314	201	231	0.01315	0.07011	0.4828	0	4	D
315	26	27	0.03094	0.16498	0.284	0	2	S
316	27	203	0.00695	0.0371	0.2556	0	4	D
317	27	222	0.0023	0.01235	0.0852	0	4	D
318	27	231	0.00232	0.01238	0.0852	0	4	D
319	28	202	0.01113	0.0594	0.9201	0	6	T
320	202	203	0.01005	0.0536	0.3692	0	4	D
321	202	225	0.0059	0.0313	0.054	0	2	S
322	203	224	0.0108	0.0577	0.0994	0	2	S
323	203	39	0.0023	0.01235	0.0852	0	4	D

324	204	207	0.00554	0.06174	0.1511	0	0	S
325	205	29	0.0058	0.03095	0.213	0	4	D
326	205	225	0.0101	0.0536	0.0923	0	2	S
327	29	206	0.0079	0.0421	0.0724	0	2	S
328	29	207	0.0116	0.0619	0.1065	0	2	S
329	206	207	0.0116	0.0619	0.1065	0	2	S
330	31	219	0.0004	0.00265	0.0164	0	4	D
331	209	212	0.003	0.0332	0.888	0	5.5	S
332	209	213	0.00339	0.03777	1.0101	0	0	S
333	210	221	0.00224	0.0249	2.664	0	11	D
334	211	212	0.00616	0.06868	1.83705	0	5.5	S
335	211	217	0.0027	0.0301	0.8047	0	5.5	S
336	211	221	0.00102	0.01141	0.30525	0	5.5	S
337	211	40	0.0075	0.084	2.2478	0	5.5	S
338	212	213	0.0025	0.0274	0.7326	0	5.5	S
339	213	214	0.00354	0.03943	1.0545	0	5.5	S
340	213	215	0.0074	0.082	2.1923	0	5.5	S
341	213	235	0.0009	0.0104	0.2775	0	5.5	S
342	214	221	0.00466	0.05188	1.3875	0	5.5	S
343	215	33	0.0072	0.0803	2.1479	0	5.5	S
344	215	221	0.00074	0.0083	0.222	0	5.5	S
345	215	239	0.00005	0.00052	0.0555	0	11	D
346	32	33	0.0007	0.0079	0.2109	0	5.5	S
347	32	218	0.00493	0.05499	1.47075	0	5.5	S
348	32	221	0.00286	0.06547	2.62463	0	8	S
349	32	40	0.0005	0.0056	0.1498	0	5.5	S
350	33	217	0.0043	0.0477	1.2765	0	5.5	S
351	216	217	0.0023	0.0259	0.6937	0	5.5	S
352	216	218	0.00065	0.00726	0.19425	0	5.5	S
353	219	77	0.0027	0.01444	0.0994	0	4	D
354	223	227	0.0108	0.0577	0.0994	0	2	S
355	223	39	0.0013	0.007	0.0482	0	4	D
356	229	35	0.00132	0.00701	0.04828	0	4	D
357	231	39	0.0058	0.03094	0.852	0	8	Q
358	233	234	0.0034	0.0373	0.999	0	5.5	S
359	233	235	0.0005	0.0055	0.5882	0	4	D
360	233	238	0.00404	0.04503	1.20435	0	0	S
361	233	239	0.00735	0.0533	2.19225	0	5.5	S
362	234	237	0.00175	0.0193	2.0646	0	11	D
363	234	238	0.0048	0.0537	1.4374	0	5.5	S
364	234	239	0.0047	0.0519	1.3875	0	5.5	S
365	40	239	0.00819	0.0913	2.442	0	5.5	S
366	40	41	0.0004	0.00435	0.4662	0	11	D
367	40	241	0.00217	0.02412	2.5807	0	11	D
368	235	236	0.00577	0.06433	1.7205	0	5.5	S
369	235	240	0.00025	0.00365	0.6118	0	4	D
370	239	241	0.00217	0.02412	2.5807	0	11	D

371	42	243	0.00418	0.02227	0.03834	0	2	S
372	42	244	0.00773	0.04124	0.071	0	0	S
373	42	245	0.02027	0.10806	0.18602	0	2	S
374	243	242	0	0.3968	0	0	0.31	S
375	243	245	0.01702	0.09074	0.1562	0	2	S
376	244	245	0.02119	0.11301	0.19454	0	0	S

*** Circuits**

S : Single circuit

D : Two circuit

T : Three circuit

Q : Four circuits

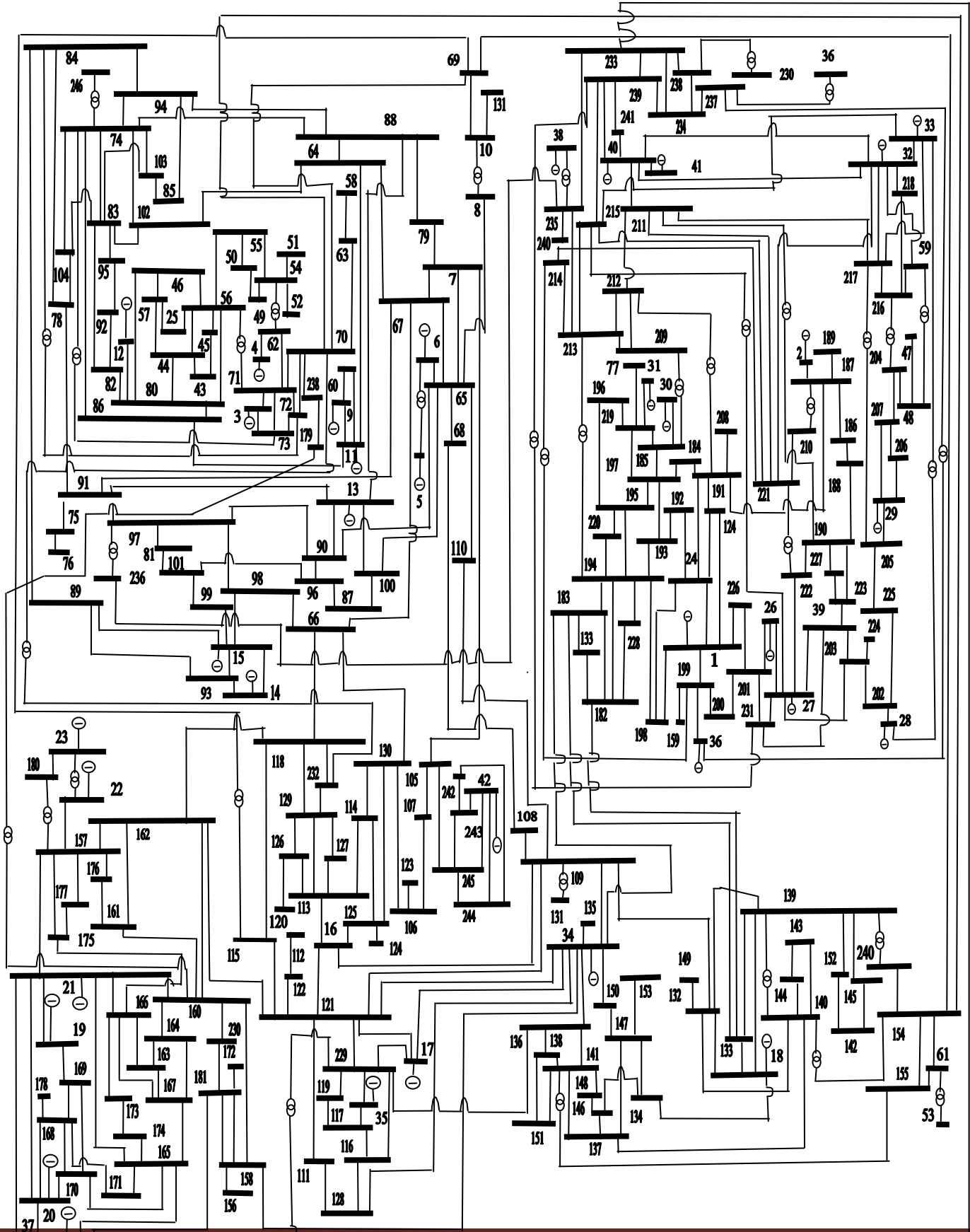
P : Five circuits

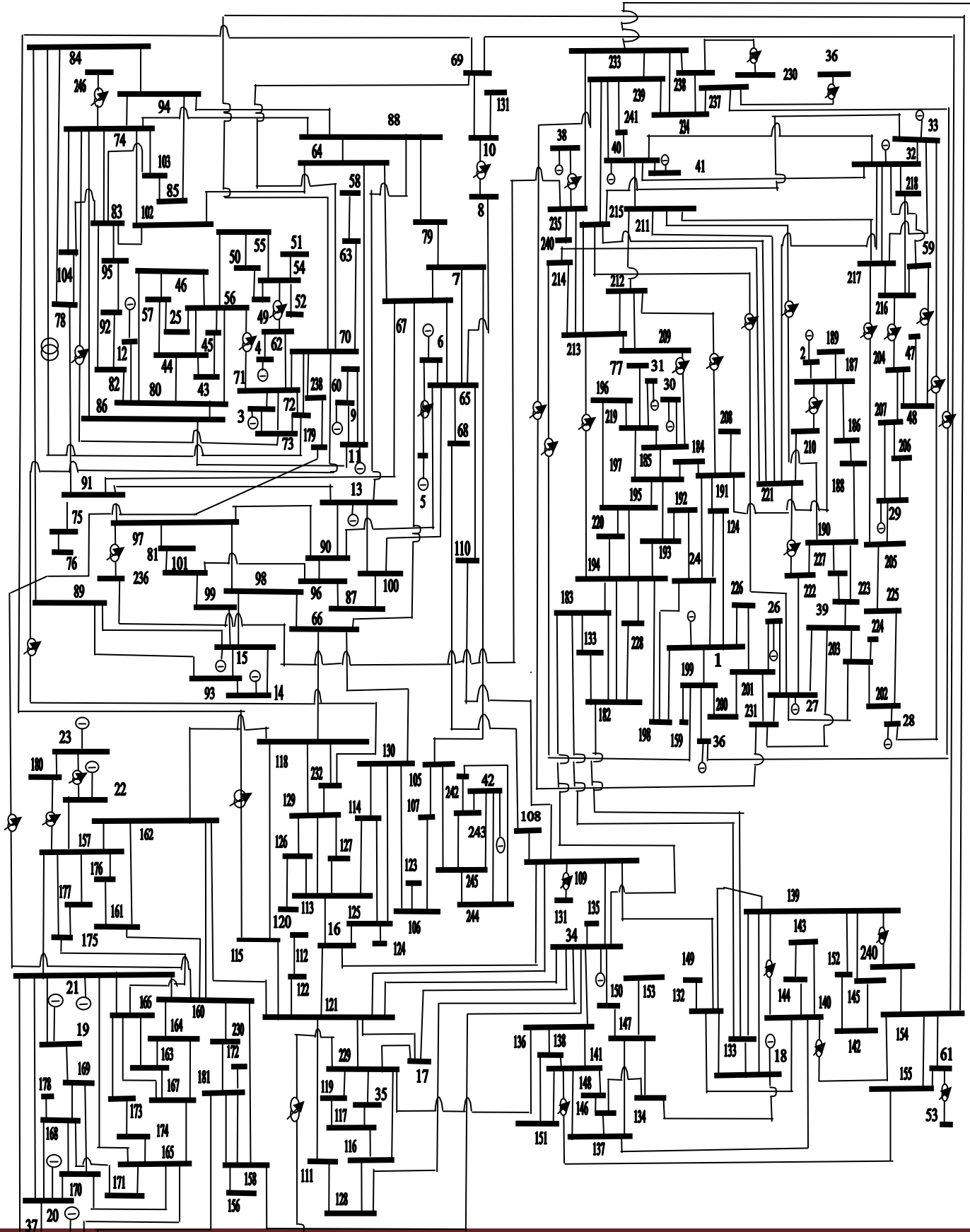
H : Six circuits

Reactor Data

Sl. No	Bus No	Bus Name	Reactors (MVA _r)
1	235	DADRI4	63
2	211	LKNOW4	163
3	212	MURBD4	50
4	213	MRDNG4	100
5	234	AGRA4	150
6	215	PANKI4	100
7	33	OBRA4	100
8	216	AZMGR4	100
9	217	SLTNP4	100
10	233	BLBGR4	180
11	237	AURYA4	50
12	40	SNGRL4	223
13	236	MLRKT4	63
14	238	JAPRN4	150
15	239	KNPRN4	210
16	221	UNNA04	213.5
17	210	BERLY4	100
18	214	AGRAUP	163.5
19	72	MOGA4	226
20	69	BHIWN4	100
21	70	HISAR4	250
22	61	ABDPR4	100
23	63	NALGRH4	100
24	3	CHMR24	100
25	4	URIG	100
26	71	KISPUR4	189
27	154	BAVANA	100
28	62	WAGORA4	63
29	59	VARNASI	50
30	218	MAUUP	50

NRPG SINGLE LINE DIAGRAM





DYNAMIC DATA FOR NRPG 246 BUS SYSTEM

Dynamic data for 60 Machine NRPG Indian System

Mac. no	Bus. no	Base MVA	Xl	R _a	X _d	X' _d	X'' _d	T' _{do}	T'' _{do}	X _q	X' _q	X'' _q	T' _{qo}	T'' _{qo}	H	D0	D1
1	1	635.3	0	0	0	0.179	0	0	0	0	0	0	0	0.1	2.7	0	0
2	2	126.3	0	0	0	0.26	0	0	0	0	0	0	0	0	7.2	7.2	0
3	3	568.5	0	0	0	0.253	0	0	0	0	0	0	0	0	4.72	4.7	0
4	4	532	0	0	0	0.27	0	0	0	0	0	0	0	0	4.72	4.7	0
5	5	227.4	0	0	0	0.3	0	0	0	0	0	0	0	0	4.04	4	0
6	6	227.4	0	0	0	0.3	0	0	0	0	0	0	0	0	4.04	4	0
7	7	694.5	0	0	0	0.259	0	0	0	0	0	0	0	0	5.03	5	0
8	8	521.1	0	0	0	0.235	0	0	0	0	0	0	0	0	4.72	4.7	0
9	9	208.5	0	0	0	0.226	0	0	0	0	0	0	0	0	4.373	4.3	0
10	10	347.4	0	0	0	0.235	0	0	0	0	0	0	0	0	4.72	4.7	0
11	11	379.2	0	0	0	0.22	0	0	0	0	0	0	0	0	4.72	4.7	0
12	12	501	0	0	0	0.27	0	0	0	0	0	0	0	0	3.5	3.5	0
13	13	1482	0.1	0	2.225	0.338	0.2297	7	4.00E-02	2.11	0.556	0.2297	2.5	2.00E-02	3.7	0	0
14	14	517.6	0.153	0	1.97	0.3027	0.225	6.84	5.00E-02	1.89	0.49	0.225	1	5.00E-02	5.6	0	0
15	15	494	0.1	0	2.225	0.338	0.2297	7	4.00E-02	2.11	0.556	0.2297	2.5	2.00E-02	3.7	0	0
16	16	517.6	0.153	0	1.97	0.3027	0.225	6.84	5.00E-02	1.89	0.49	0.225	1	5.00E-02	5.6	0	0
17	16	494	0.1	0	2.225	0.338	0.2297	7	4.00E-02	2.11	0.556	0.2297	2.5	2.00E-01	3.7	0	0
18	17	211.8	7.00E-02	0	1.344	0.213	0.123	6.1	3.00E-02	1.254	0.461	0.123	1	3.00E-02	4	0	0
19	18	43.1	8.40E-02	0	1.05	0.185	0.125	6.1	4.00E-02	0.98	0.36	0.125	0.3	9.90E-02	6.18	0	0
20	18	234.3	0.135	0	1.635	0.309	0.178	5.364	3.20E-02	1.56	0.41	0.178	0.344	9.50E-02	2.405	0	0
21	18	68.8	0.1215	0	1.86	0.157	0.142	9.8	5.50E-02	1.772	0.4076	0.142	1.826	0.108	3.35	0	0
22	18	158.8	8.40E-02	0	1.05	0.185	0.125	6.1	4.00E-02	0.98	0.36	0.125	0.3	9.90E-02	6.18	0	0
23	18	17.6	8.40E-02	0	1.05	0.185	0.125	6.1	4.00E-02	0.98	0.36	0.125	0.3	9.90E-02	6.18	0	0
24	18	201.6	9.00E-02	0	1.725	0.166	0.12	6.706	3.50E-02	1.656	0.431	0.12	0.75	7.00E-02	7	0	0
25	18	120	8.00E-02	0	1.3	0.2	0.12	6	4.00E-02	1.25	0.4	0.12	1	7.00E-02	4	0	0
26	18	310.5	9.50E-02	0	1.86	0.285	0.147	11.3	4.20E-02	1.79	0.333	0.147	1	7.90E-02	7	0	0

27	19	517.6	0.156	0	1.817	0.25	0.21	7.11	4.00E-02	1.707	0.51	0.21	0.4	7.00E-02	5.85	0	0
28	20	518	0.156	0	1.817	0.25	0.21	7.11	4.00E-02	1.707	0.51	0.21	0.4	7.00E-02	5.85	0	0
29	21	258.8	0.153	0	1.97	0.3027	0.225	6.84	5.00E-02	1.89	0.49	0.225	0.4	5.00E-02	5.6	0	0
30	21	741	0.1	0	2.225	0.338	0.2297	7	4.00E-02	2.11	0.556	0.2297	2.5	4.00E-02	3.7	0	0
31	22	588.2	0.1	0	2.225	0.338	0.2297	7	4.00E-02	2.11	0.556	0.2297	2.5	2.00E-02	3.7	0	0
32	23	588	0.1	0	2.225	0.338	0.2297	7	4.00E-02	2.11	0.556	0.2297	2.5	2.00E-02	3.7	0	0
33	24	553	0.156	0	1.817	0.25	0.21	7.11	4.00E-02	1.707	0.51	0.21	0.4	7.00E-02	5.85	0	0
34	25	605.1	0	0	0	0.271	0	0	0	0	0	0	0	0	4.8	4.8	0
35	26	258.8	7.30E-02	0	1.454	0.218	0.1505	6.84	3.30E-02	1.4	0.364	0.1505	1	2.40E-02	2.75	0	0
36	27	258.8	0.169	0	2.17	0.3	0.207	6.84	4.80E-02	2.05	0.54	0.207	0.5	2.10E-02	3.195	0	0
37	28	294	0.1	0	1.95	0.229	0.14	6.5	5.00E-02	1.8	0.49	0.14	0.5	0.1	2.7	0	0
38	28	235.4	0.153	0	1.97	0.3027	0.225	6.84	5.00E-02	1.89	0.49	0.225	1	5.00E-02	5.6	0	0
39	29	388.2	0.153	0	1.97	0.3027	0.225	6.84	5.00E-02	1.89	0.49	0.225	1	5.00E-02	5.6	0	0
40	30	63.2	0	0	0	0.3	0	0	0	0	0	0	0	0.1	4.35	0	0
41	31	189.6	0	0	0	0.286	0	0	0	0	0	0	0	0.1	3.787	0	0
42	32	741	0.1	0	2.225	0.338	0.2297	7	4.00E-02	2.11	0.556	0.2297	2.5	0.2	3.7	0	0
43	32	1176	0.139	0	2.31	0.267	0.223	9	4.00E-02	2.19	0.7	0.223	2.5	0.2	3.07	0	0
44	33	1176.5	0.2297	0	2.225	0.338	0.2297	7	4.00E-02	2.11	0.556	0.2297	2.5	2.00E-02	3.7	0	0
45	34	353.1	0.153	0	1.97	0.3027	0.225	6.84	5.00E-02	1.89	0.49	0.225	1	5.00E-02	5.6	0	0
46	34	494	0.1	0	2.225	0.338	0.2297	7	4.00E-02	2.11	0.556	0.2297	2.5	0.2	3.7	0	0
47	35	312	9.50E-02	0	1.86	0.285	0.147	11.3	4.20E-02	1.79	0.333	0.147	1	7.90E-02	7	0	0
48	35	175	9.50E-02	0	1.9	0.285	0.15	11.3	4.20E-02	1.83	0.34	0.15	1	7.90E-02	4	0	0
49	36	564.4	9.50E-02	0	1.86	0.285	0.147	11.3	4.20E-02	1.79	0.333	0.147	1	7.90E-02	7	0	0
50	36	288.4	9.50E-02	0	1.9	0.285	0.15	11.3	4.20E-02	1.83	0.34	0.15	1	7.90E-02	4	0	0
51	37	310.5	0.19	0	2.4	0.314	0.236	8.3	4.00E-02	2.34	0.5	0.236	0.72	7.00E-02	2.76	0	0
52	37	175.3	0.169	0	2.17	0.333	0.207	6.84	4.80E-02	2.05	0.472	0.207	0.5	7.00E-02	3.195	0	0
53	38	988	0.1	0	2.225	0.338	0.2297	7	4.00E-02	2.11	0.556	0.2297	2.5	2.00E-01	3.7	0	0
54	38	616.4	8.00E-02	0	1.52	0.204	0.12	11.3	4.20E-02	1.368	0.472	0.12	0.5	7.00E-02	3.2	0	0
55	38	344.8	8.00E-02	0	1.52	0.204	0.12	11.3	4.20E-02	1.368	0.472	0.12	0.5	7.00E-02	3.2	0	0
56	39	988	0.1	0	2.225	0.338	0.2297	7	4.00E-02	2.11	0.556	0.2297	2.5	2.00E-02	3.7	0	0
57	40	235.3	0.1	0	2.12	0.29	0.2	7	4.00E-02	2	0.556	0.2	2.5	2.00E-01	3.7	0	0
58	40	352.8	0.15	0	2.35	0.27	0.22	9	4.00E-02	2.15	0.65	0.22	2.5	2.00E-01	3.7	0	0
59	41	1210	0.19	0	2.4	0.309	0.235	8.3	2.50E-02	2.33	0.5	0.235	0.72	2.30E-02	3.07	0	0
60	42	252.6	0	0	0	0.213	0	0	0	0	0	0	0	0.1	3.557	0	0

Exciter data

Type Of Exiter	Gen. No	TR	KA	TA	TB	TC	V(max)	V(min)	KE	TE	E1	SE(E1)	E2	SE(E2)	KF	TF
1	14	0.06	200	0.1	0	0	5.88	-5	1.00E+0	0.4	3.23	0.09	4.3	3.60E-01	0.033	1
0	15	0	200	0.025	0	0	6	-4.6	0.00E+0	0	0	0	0	0.00E+00	0	0
1	16	0.06	200	0.1	0	0	5.88	-5	1.00E+0	0.4	3.23	0.09	4.3	3.60E-01	0.033	1
1	17	0.06	200	0.1	0	0	5.88	-5	1.00E+0	0.4	3.23	0.09	4.3	3.60E-01	0.033	1
1	18	0.025	25	0.2	0	0	1	-1	0.00E+0	0.654	3.588	0.074	4.784	2.67E-01	0.105	0.35
1	19	0.04	2.50E+01	0.04	0	0	6	-5	1.00E+0	0.7	3	0.08	4	2.00E-01	0.01	1
1	20	0.06	4.00E+01	0.1	0	0	1	-1	0.00E+0	0.5	4.5	0.12	6	4.70E-01	0.087	1
1	21	0.06	40	0.1	0	0	1	-1	0.00E+0	0.5	4.5	0.12	6	4.70E-01	0.087	1
1	22	0.04	25	0.04	0	0	6	-5	1.00E+0	0.7	3	0.08	4	0.2	0.01	1
1	23	0.04	2.50E+01	0.04	0	0	6	-5	1.00E+0	0.7	3	0.08	4	2.00E-01	0.01	1
1	24	0	4.00E+02	0.02	0	0	7.3	-6.6	1.00E+0	0.2	5	0.03	6.64	1.00E-01	0.38	1
1	25	0.04	2.50E+01	0.04	0	0	6	-6	1.00E+0	0.7	3	0.08	4	2.00E-01	0.01	1
0	26	0	1.46E+02	0.025	0	0	6.93	-4.68	0.00E+0	0	0	0	0	0.00E+00	0	0
1	27	0.06	2.50E+01	0.04	0	0	6.5	-6.5	1.00E+0	0.7	3	0.08	4	2.00E-01	0.01	1
0	28	0	200	0.05	0	0	4.5	-4	0.00E+0	0	0	0	0	0.00E+00	0	0
1	29	0.06	200	0.1	0	0	5.88	-5	1.00E+0	0.4	3.23	0.09	4.3	3.60E-01	0.033	1
0	30	0	200	0.025	0	0	6	-4.6	0.00E+0	0	0	0	0	0.00E+00	0	0
0	31	0	200	0.025	0	0	6	-4.6	0.00E+0	0	0	0	0	0.00E+00	0	0
0	32	0	200	0.025	0	0	6	-4.6	0.00E+0	0	0	0	0	0.00E+00	0	0
1	33	0.06	25	0.04	0	0	6.5	-6.5	1.00E+0	0.7	3	0.08	4	2.00E-01	0.01	1
1	35	0.06	200	0.02	0	0	5	-5	1.00E+0	1.38	3	0.09	4	3.68E-01	0.1	3
1	36	0.04	25	0.04	0	0	6	-6	1	0.7	3	0.08	4	0.2	0.01	1
1	37	0.04	2.50E+01	0.04	0	0	6	-6	1.00E+0	0.7	3	0.08	4	2.00E-01	0.01	1
1	38	0.04	25	0.04	0	0	6	-6	1.00E+0	0.7	3	0.08	4	2.00E-01	0.01	1

1	39	0.06	200	0.1	0	0	5.88	-5	1.00E+0	0.4	3.23	0.09	4.3	0.36	0.033	1
0	42	0	200	0.025	0	0	6	-4.6	0.00E+0	0	0	0	0	0.00E+00	0	0
1	43	0.01	600	0.02	0	0	17.3	-17.3	1.00E+0	0.33	5.47	0.45	7.3	1.37E+00	0.02	1
0	44	0	200	0.025	0	0	6	-4.6	0	0	0	0	0	0	0	0
1	45	0.06	200	0.1	0	0	5.88	-5	1	0.4	3.23	0.09	4.3	0.368	0.033	1
0	46	0	200	0.025	0	0	6	-4.6	0.00E+00	0	0	0	0	0	0	0
0	47	0	146	0.025	0	0	6.93	-4.68	0.00E+0	0	0	0	0	0	0	0
0	48	0	200	0.025	0	0	6	-4.6	0.00E+0	0	0	0	0	0.00E+00	0	0
0	49	0	146	0.025	0	0	6.93	-4.68	0.00E+0	0	0	0	0	0.00E+00	0	0
0	50	0	146	0.025	0	0	6.93	-4.68	0.00E+0	0	0	0	0	0	0	0
1	51	0.04	2.50E+01	0.04	0	0	6	-5	1.00E+0	0.5	3.75	0.08	5	2.00E-01	0.01	1
1	52	0.04	2.50E+01	0.04	0	0	6	-5	1.00E+0	0.5	3.75	0.08	5	2.00E-01	0.01	1
0	53	0	2.00E+02	0.025	0	0	6	-4.6	0.00E+0	0	0	0	0	0.00E+00	0	0
1	54	0.04	2.50E+01	0.04	0	0	5	-5	1.00E+0	0.7	3	0.08	4	2.00E-01	0.01	1
1	55	0.04	25	0.04	0	0	5	-5	1.00E+0	0.7	3	0.08	4	2.00E-01	0.01	1
0	56	0	200	0.025	0	0	6	-4.6	0.00E+0	0	0	0	0	0.00E+00	0	0
0	57	0	200	0.025	0	0	6	-4.6	0.00E+0	0	0	0	0	0.00E+00	0	0
0	58	0	6.00E+02	0.025	0	0	16.9	-16.9	1.00E+0	0.37	5.175	1.26	6.9	1.45E+00	0.02	1
1	59	0.01	7.00E+02	0.025	0	0	16.7	-13.4	1.00E+0	0.29	4.673	1.57	6.23	1.68E+00	0.086	1