

Table 1: Description about parameters.

Load Name	Bus Numbers
Type-1	1 – Load Bus (no generation)
Type-2	1 – generator or plant bus
Type-3	swing or slack bus
QD	reactive power demand (MVar)
GS	shunt conductance (MW demanded at $V = 1.0 \text{ p.u.}$)
BS	shunt susceptance (MVar injected at $V = 1.0 \text{ p.u.}$)
VM	voltage magnitude (p.u.)
BASE kV	base voltage (kV)

Table 2: Primorskaya Energy System, Bus Data.

BUS ID	TYPE	PD	QD	GS	BS	BASE kV
1	3	3020	1896	10.72	-361.68	500
2	1	273.53	134.49	10.11	-1.58	220
3	1	14.9	10.4	0	-0	220
4	1	11.9	5.66	0	-0	220
5	1	110.67	50.82	0	-0	220
6	1	147.63	48.51	0.79	-0.79	220
7	1	17.75	10.71	0	-0	220
8	2	7.2	0	0.88	-0.88	18
9	1	0	0	0	-0	220
10	1	0	0	8.46	-1.32	220
11	1	0	0	2.85	-180.26	500
12	1	42.95	31.92	0	-0	220
13	1	8.78	1.16	0	-0	220
14	1	2.54	0.69	0	-0	220
15	1	10.05	4.04	0	-0	220
16	1	4.5	3.47	0	-0	220
17	1	11.55	4.4	0	-0	220
18	1	12.13	6.81	0	-0	220
19	1	18.38	9.87	32.67	-3.72	220
20	2	0	0	10.15	-0.94	15.75
21	2	0	0	10.32	-1.99	10.5
22	2	0	0	6.64	-0.89	15.75
23	1	0	0	6.74	-436.37	500
24	2	5.38	0	4.65	-0.97	15.75
25	1	15.36	9.45	0	-0	220
26	1	57.4	21.71	0	-0	220
27	1	51.51	19.64	0	-0	220
28	1	3.68	1.58	0	-0	220
29	1	16.98	8.43	0	-0	220
30	1	11.55	4.32	0	-0	220
31	1	181.27	53.36	0	-0	220
32	1	24.15	10.58	0	-0	220
33	1	0	0	0.48	-0.48	220
34	1	0	0	1.49	-1.49	500
35	1	82.11	12.5	0	-0	220
36	1	0	0	4.72	-0.74	220
37	1	204.75	48.72	0	-0	220
38	1	28.53	5.89	0	-0	220
39	1	0.23	0.12	0	-0	220
40	1	66.99	37.38	0	-0	220
41	1	0	0	4.9	-0.76	500
42	1	387.7	173.03	0	-0	220
43	1	0	0	1.03	-1.03	220
44	1	0	0	0.97	-0.97	500
45	1	0	0	4.78	-0.75	500
46	1	5.07	2.21	4.82	-0.75	220
47	1	58.33	24.49	0	-0	220
48	1	5.07	2.21	0	-0	220
49	1	72.24	42	0	-0	220
50	1	0.23	0.12	0	-0	220
51	1	36.64	21.2	0	-0	220
52	1	0	0	2	-0.45	220
53	2	0	0	5.5	-0.5	10.5
54	2	0	0	5.5	-0.5	10.5
55	2	0	0	4.52	-0.5	10.5
56	1	58.9	43.17	1.31	-0.29	220
57	2	0	0	5.52	-0.49	10.5
58	2	0	0	12.21	-0.49	10.5
59	1	105	28.09	0	-0	220
60	1	0	0	0	-0	220
61	1	0	0	0	-0	220
62	1	0	0	0	-0	220
63	1	0	0	0.1	-0.12	220
64	1	18	21	0.11	-0.14	35