

APPENDIX

for

CHAPTER 6

(6.3-3)

Appendix 6.3-3 Load and Installed Capacity of Distribution Substations (WEA Original Plan, Planning Year = 1997 - 2001)

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No	ABB	Substation	Voltage (KV)	1996				1997				
				Bank configuration	Capacity (MVA)	coincident (MW)	non-coincidental (MVA)	utilization factor (%)	Bank configuration	Capacity (MVA)	coincident (MW)	non-coincidental (MVA)
1	BB	Bangbon	69-12 69-24	3 x 40 x	120 0	59.67 0	77.66 0.00	61.7 0.0	120 0	46.41 0	60.27 0.00	50.2 0.0
2	BX	Bangchalong	115-24	1 x 60 x	60	32.04	41.70	69.5	120	64.63	83.87	68.9
3	BA	Bangpapi	69-12 69-24	2 x 40 x	80 60	38.41 21.93	49.99 28.54	42.5 47.6	80 60	28.47 22.00	36.95 28.55	16.2 17.6
4	XA	Bangbhen	115-24	1 x 60 x	60	22.38	29.13	48.6	60	27.15	35.23	38.7
5	BK	Bangbunprom	69-12	3 x 40 x	120	64.58	84.05	70.1	120	61.47	79.77	66.5
6	BL	Banghlo	69-12 69-24	2 x 40 x	80 0	38.55	50.13	62.7	40 0	25.14	32.62	81.6
7	BO	Bangkok noi	69-12	1 x 40 x	40	18.05	23.49	58.7	40	18.52	21.03	60.1
8	BC	Bangkrachao	69-12	1 x 40 x	40	19.08	24.83	62.1	40	18.00	23.36	38.9
9	BN	Bangwood	69-12 69-24	2 x 40 x	80 0	39.40	51.28	64.1	80 0	36.84	47.81	59.8
10	BC	Bangna	69-12 69-24	1 x 40 x	40 40	14.02	18.25	45.6	80	40.70	52.82	66.0
11	BJ	Bangna jued	115-24	1 x 20 x	60	71.44	92.98	66.4	60	75.21	97.60	69.7
12	BI	Bangping	115-24	2 x 60 x	120	69.22	90.08	75.1	120	64.11	83.20	69.3
13	BK	Bangplakod	69-12 69-24	3 x 40 x	120 0	57.74	75.15	62.6	120 0	62.29	80.83	67.4
14	BP	Bangpice	69-24	2 x 60 x	120	59.54	77.49	64.6	120	51.63	67.00	55.8
15	PC	Bangpongpong	115-24	1 x 40 x	40	22.00	28.63	71.6	40	20.19	26.20	65.5
16	BD	Bangpood	69-24	1 x 60 x	60	20.52	26.71	44.5	60	23.00	36.34	60.6
17	BU	Bangpu	115-24	2 x 60 x	120	52.76	68.67	57.2	120	49.14	63.77	53.1
18	BV	Bangrakvai	115-24	2 x 40 x	80	51.05	66.44	83.1	80	46.51	60.36	75.5
19	BS	Bangsaolong	115-24	2 x 60 x	120	39.35	51.22	42.7	120	42.23	54.80	45.7
20	BY	Bangyothan	69-12 69-24	1 x 60 x	60 0	28.88	37.34	62.2	60 0	31.76	41.22	68.7
21	CG	Chalengkong	115-24	2 x 40 x	80	37.59	48.93	61.2	40	22.13	28.72	71.8
22	CK	Chankasom	69-24	2 x 50 x	100	50.33	65.51	65.5	100	59.42	77.11	77.1
23	CL	Chidlow	69-24	2 x 60 x	120	46.71	60.80	50.7	120	48.73	63.24	52.1
24	DN	Duanwang	69-12 69-24	2 x 40 x	80 60	38.20	49.72	62.2	80 60	45.13	58.57	41.8
25	DK	Itaykang	115-24	1 x 60 x	60	15.89	20.81	34.7	60	31.85	41.33	68.9
26	NP	Kingetch	69-12 69-24	3 x 40 x	120 0	50.61	65.37	54.9	120 0	53.59	69.51	58.0
27	KJ	Klongjan	69-12 69-24	1 x 40 x	60 160	69.29	90.18	56.4	60 160	63.82	82.82	51.8

Appendix 6.3-3 Load and Installed Capacity of Distribution Substations (MEA Original Plan, Planning Year = 1997 - 2001)

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No	ABB	Substation	Voltage (KV)	1998				1999					
				Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)
1	BB	Bangbon	69-12 69-24	3 x 40 x	120 0	49.18 0	63.77 0.00	53.1 0.0	2 x 40 1 x 40	80 40	31.15 26.35	40.36 34.11	50.5 85.1
2	BN	Bangchalong	115-24	2 x 60 x	120	67.21	87.15	72.6	2 x 60 x	120	61.90	80.21	66.8
3	BA	Bangkapi	69-12 69-24	2 x 40 x	80 60	29.00 23.49	37.61 30.46	47.0 50.8	2 x 40 1 x 60	40 80	30.59 24.00	39.61 31.10	49.6 51.8
4	LA	Bangkhun	115-24	1 x 60 x	60	28.24	36.62	61.0	2 x 60 x	120	33.05	42.82	35.7
5	BR	Bangkhunprom	69-12	3 x 40 x	120	62.70	81.30	67.8	3 x 40 x	120	64.90	81.09	70.1
6	BL	Bangkok	69-12 69-24	1 x 40 x	40	17.00	22.04	55.1	1 x 40 x	40	17.00	22.02	55.1
7	BO	Bangkok noi	69-12	1 x 40 x	40	20.29	26.31	65.8	1 x 40 x	40	21.78	28.22	70.6
8	BC	Bangkrachao	69-12 69-24	2 x 10 x	20 0	7.16	9.28	46.4	2 x 10 x	20 0	7.45	9.65	48.3
9	BI	Bangmod	69-12 69-24	2 x (40) x	80 0	38.31	49.68	62.1	2 x (40) x	80 60	25.85 20.00	33.19 25.91	41.9 43.2
10	BC	Bangna	69-12 69-24	x 2 x 40	0 80	0 43.65	0.00 56.60	0.0 70.8	x 2 x 40	0 80	0 46.67	0.00 60.47	0.0 73.6
11	BJ	Bangna luad	115-24	1 x 20 x	60	85.81	111.01	79.3	1 x 20 x	60	85.16	110.31	78.8
12	BI	Bangplad	115-24	2 x 60 x	120	70.87	91.50	76.6	2 x 60 x	120	73.71	95.55	79.6
13	BI	Bangplad	69-12 69-24	3 x (40) x	120 0	57.42	74.46	62.1	3 x (40) x	120 0	61.57	79.78	66.5
14	BP	Bangplee	69-24 115-24	2 x 60 x	120 0	53.70	69.63	58.0	2 x 60 x	120	55.85	74.37	60.3
15	PG	Bangpoungung	69-12 69-24 115-24	1 x 40 x	40	19.12	24.79	62.0	x x	0	0	0.00	0.0
16	BD	Bangpood	69-24 115-24	2 x 60 x	120	51.11	66.28	55.2	2 x 60 x	120	53.15	68.87	57.4
17	BU	Bangpu	115-24	2 x 40 x	80	48.37	62.72	78.4	2 x 40 x	80	50.31	65.19	81.5
18	RY	Bangrakvai	115-24	2 x 60 x	120	44.08	57.16	47.6	2 x 60 x	120	48.81	63.28	52.7
19	RS	Bangsantong	115-24	1 x 60 x	60	33.03	42.83	71.4	1 x 60 x	60	31.35	41.51	71.2
20	RY	Bangyechan	69-12 69-24	1 x 40 x	40	21.70	28.14	70.4	1 x 40 x	40	21.30	27.60	69.0
21	OC	Chalongkrong	69-24	1 x 40 x	40	31.12	37.8	77.8	1 x 40 x	40	21.02	35.01	87.5
22	CK	Chantassu	115-24	1 x 60 x	60	30.70	39.81	65.4	1 x 60 x	60	31.93	41.37	69.0
23	CL	Chidom	69-12 69-24	2 x 40 x	80	31.67	41.07	51.3	2 x 40 x	80	16.59	21.50	53.7
24	DN	Duanmang	69-12 69-24	1 x 60 x	60	33.13	42.86	71.6	1 x 60 x	60	18.80	23.23	63.2
25	IK	Luaykwang	230-12 69-24	2 x 50 x	100 0	61.80	80.14	80.1	2 x 50 x	100 0	63.69	82.53	82.5
26	KP	Kingpetch	69-12 69-24	3 x (40) x	120 0	58.81	76.26	63.6	3 x (40) x	120 0	65.16	81.13	70.4
27	XJ	Xiongjan	69-12 69-24	1 x 40 x	60	55.91	72.50	45.3	1 x 40 x	60	52.99	68.66	42.9

Appendix 6.3-3 Load and Installed Capacity of Distribution Substations (MEA Original Plan, Planning Year = 1997 - 2001)

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No	ABB	Substation	Voltage (KV)	2000				2001						
				Bank configuration	Capacity (MVA)	coincident (WF)	non-coinci (NVA)	utilization factor (%)	Bank configuration	Capacity (MVA)	coincident (WF)	non-coinci (NVA)	utilization factor (%)	
1	BB	Bungbon	69-12	2 X 40	80	35.32	45.78	57.2	X	X	0	0.00	0.0	
			69-24	1 X 40	40	25.00	32.40	81.0	X	3 X 40	120	61.08	82.90	69.1
2	BY	Bungchalong	115-24	2 X 60	120	63.76	82.61	68.9	X	2 X 60	120	65.67	81.95	70.8
3	BA	Bungkapi	69-12	2 X 40	80	36.22	46.95	58.7	X	2 X 40	80	31.49	41.62	55.8
			69-24	1 X 60	60	30.00	38.89	64.8	X	1 X 60	60	33.72	43.63	72.1
4	EA	Bungkhuen	115-24	2 X 60	120	36.98	47.93	39.9	X	2 X 60	120	36.91	47.79	39.8
5	BR	Bungkhuprom	69-12	3 X 40	120	66.75	86.52	72.1	X	3 X 40	120	56.50	73.10	60.4
6	BL	Bungkio	69-12	1 X 40	40	17.50	22.68	56.7	X	X	0	0.00	0.0	
			69-24	1 X 40	40	22.45	29.10	72.8	X	2 X 40	80	41.15	53.21	66.6
7	BO	Bangkak noi	69-12	1 X 40	40	19.97	25.88	61.7	X	1 X 40	40	18.72	21.22	60.6
			69-24	1 X 60	60	25.00	32.40	51.0	X	1 X 60	60	27.60	35.71	50.5
8	BC	Bangkrachao	69-12	2 X 10	20	8.67	11.24	56.2	X	2 X 10	20	8.93	11.55	57.8
			69-24	X	0	0.00	0.00	0.0	X	X	0	0.00	0.0	
9	BN	Bangnod	69-12	2 X (40)	80	41.22	53.43	66.8	X	2 X (40)	80	39.53	51.14	63.9
			69-24	1 X 60	60	28.00	36.29	60.5	X	1 X 60	60	31.77	41.10	58.5
10	BC	Bangnai	69-12	X	0	0.00	0.00	0.0	X	X	0	0.00	0.0	
			69-24	2 X 40	80	40.27	52.20	65.3	X	2 X 40	80	41.27	53.98	66.7
11	BJ	Bangnamued	115-24	1 X 20	20	75.17	97.43	69.5	X	1 X 20	20	70.52	91.24	65.2
12	BI	Bangpieng	115-24	2 X 60	120	63.63	82.48	68.7	X	2 X 60	120	66.57	86.13	71.8
13	BA	Bangplakrod	69-12	3 X (40)	120	63.51	82.32	68.6	X	3 X (40)	120	68.51	88.61	73.9
			69-24	X	0	0.00	0.00	0.0	X	X	0	0.00	0.0	
14	BP	Bangpice	69-24	2 X 60	120	57.52	74.56	62.1	X	2 X 60	120	59.25	76.66	63.9
			115-24	X	0	0.00	0.00	0.0	X	X	0	0.00	0.0	
15	PC	Bangpanggang	69-12	X	0	0.00	0.00	0.0	X	X	0	0.00	0.0	
			69-24	X	0	0.00	0.00	0.0	X	X	0	0.00	0.0	
			115-24	2 X 60	120	52.69	68.30	56.9	X	2 X 60	120	55.30	71.55	59.6
16	BP	Bangpoed	69-24	X	0	0.00	0.00	0.0	X	X	0	0.00	0.0	
			115-24	2 X 60	120	54.75	70.97	59.1	X	2 X 60	120	48.00	62.10	51.8
17	BU	Bangpu	115-24	2 X 40	80	47.81	61.97	77.5	X	2 X 40	80	48.25	63.72	79.7
18	BY	Bangrakayai	115-24	2 X 80	120	50.22	65.09	51.2	X	2 X 60	120	42.27	51.69	45.6
19	BS	Bangsanitong	115-24	1 X 60	60	31.38	40.67	57.8	X	1 X 60	60	32.32	41.81	49.7
20	BY	Bangyockkhan	69-12	1 X 40	40	18.00	23.33	58.3	X	X	0	0.00	0.0	
			69-24	1 X 40	40	29.59	38.35	95.9	X	2 X 40	80	40.78	52.76	66.0
21	CS	Chaloeckrong	115-24	1 X 60	60	32.88	42.62	71.0	X	1 X 60	60	33.87	43.82	73.0
22	CK	Chankasae	69-12	1 X 40	40	17.09	22.15	55.4	X	1 X 40	40	17.60	22.77	56.9
			69-24	1 X 60	60	49.33	63.91	63.9	X	1 X 40	40	53.90	69.73	89.7
23	CL	Chidlow	230-12	2 X 50	100	65.60	85.03	85.0	X	2 X 50	100	67.57	87.12	87.1
			69-24	X	0	0.00	0.00	0.0	X	X	0	0.00	0.0	
24	DN	Donaung	69-12	X	0	0.00	0.00	0.0	X	X	0	0.00	0.0	
			69-24	X	0	0.00	0.00	0.0	X	X	0	0.00	0.0	
			115-24	3 X 60	180	50.28	65.17	36.2	X	3 X 60	180	51.79	67.00	37.2
25	HK	Huakkeang	69-24	2 X 60	120	55.71	72.21	60.2	X	3 X 60	180	74.53	96.12	53.5
26	KV	Kingpetich	69-12	3 X (40)	120	67.12	87.00	72.5	X	2 X (40)	80	41.91	51.26	67.8
			69-24	X	0	0.00	0.00	0.0	X	1 X 60	60	27.19	35.18	50.6
27	KJ	Krongjan	69-12	X	0	0.00	0.00	0.0	X	X	0	0.00	0.0	
			69-24	1 X 10	10	51.58	70.75	44.2	X	1 X 10	10	56.22	72.71	45.5

No.	ABB	Substation	Voltage (KV)	1996				1997					
				Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)
28	KN	Klongmai	69-12	1 x	0	0	0.00	0.0	0.00	0.0	0.0	0.0	0.0
			69-24	1 x	40	16.69	21.72	51.3	18.93	21.57	61.1	21.57	61.1
29	SC	Klongsuaenchai	69-12	1 x	40	27.74	36.11	90.3	40.79	52.93	66.2	52.93	66.2
			69-24	1 x	40	0	0.00	0.0	0	0.00	0.0	0.00	0.0
			115-24	1 x	0	0	0.00	0.0	0	0.00	0.0	0.00	0.0
30	KS	Klongsuaensanit	69-12	2 x	80	39.95	52.00	65.0	49.11	63.73	79.7	63.73	79.7
			69-24	2 x	40	0	0.00	0.0	0	0.00	0.0	0.00	0.0
31	KN	Klongsarn	69-12	1 x	0	0	0.00	0.0	0	0.00	0.0	0.00	0.0
			69-24	2 x	80	43.23	56.27	70.3	43.51	56.59	70.7	56.59	70.7
32	KT	Klongtoey	69-12	2 x	80	39.29	51.14	63.9	31.19	40.48	50.6	40.48	50.6
			69-24	2 x	0	0	0.00	0.0	0	0.00	0.0	0.00	0.0
33	VC	Klongratsing	69-12	2 x	80	29.39	38.25	47.8	30.42	39.18	49.1	39.18	49.1
			69-24	2 x	0	0	0.00	0.0	0	0.00	0.0	0.00	0.0
34	KU	Krunai	69-12	1 x	80	39.65	51.61	64.5	31.92	41.42	51.8	41.42	51.8
			69-24	1 x	0	0	0.00	0.0	0	0.00	0.0	0.00	0.0
35	LK	Lardplakao	115-24	1 x	60	24.88	32.38	54.0	28.15	36.53	60.9	36.53	60.9
36	LP	Lardprao	69-12	2 x	40	26.93	35.05	87.6	32.70	42.11	53.0	42.11	53.0
			69-24	2 x	0	0	0.00	0.0	0	0.00	0.0	0.00	0.0
37	LN	Lumpini	69-12	4 x	160	85.99	111.14	89.5	87.55	113.61	71.0	113.61	71.0
			69-24	4 x	0	0	0.00	0.0	0	0.00	0.0	0.00	0.0
38	NN	Nahisavan	69-12	2 x	80	16.00	20.83	26.0	17.37	22.80	28.5	22.80	28.5
			69-24	1 x	60	20.14	26.21	43.7	23.75	30.82	51.4	30.82	51.4
39	NH	Nahaeck	69-12	2 x	40	54.16	70.49	58.7	64.35	83.51	69.6	83.51	69.6
			115-24	2 x	0	0	0.00	0.0	0	0.00	0.0	0.00	0.0
40	NA	Nai-ad	69-12	2 x	80	39.64	51.59	64.5	43.11	55.91	69.9	55.91	69.9
			69-24	2 x	0	0	0.00	0.0	0	0.00	0.0	0.00	0.0
41	NS	Nakasun	69-12	2 x	80	53.14	69.16	85.5	67.22	87.23	72.7	87.23	72.7
			69-24	2 x	0	0	0.00	0.0	0	0.00	0.0	0.00	0.0
42	NB	Ninburi	115-24	2 x	120	52.90	68.85	57.4	50.76	65.87	51.9	65.87	51.9
43	NC	Nochit	69-12	2 x	40	44.52	57.95	48.3	45.22	58.68	48.9	58.68	48.9
			69-24	2 x	0	0	0.00	0.0	0	0.00	0.0	0.00	0.0
44	NC	Nuangmain	115-24	2 x	120	59.63	77.61	61.7	55.31	71.78	59.8	71.78	59.8
45	NI	Nuangthong 1	115-24	1 x	60	41.64	54.20	90.3	50.67	65.75	51.8	65.75	51.8
46	NN	Nana	69-12	1 x	40	14.79	19.25	48.1	16.00	20.76	51.9	20.76	51.9
			69-24	2 x	60	17.18	22.36	18.6	23.35	30.30	25.3	30.30	25.3
			115-24	1 x	0	0	0.00	0.0	0	0.00	0.0	0.00	0.0
47	NI	Nongkham	69-12	1 x	40	22.00	28.63	71.6	21.05	31.21	78.0	31.21	78.0
			69-24	1 x	60	24.24	31.55	52.6	25.00	32.41	54.1	32.41	54.1
48	NP	Nonthaburi	69-12	2 x	80	48.81	63.53	79.4	40.32	52.32	65.1	52.32	65.1
			115-12	2 x	0	0	0.00	0.0	0	0.00	0.0	0.00	0.0
			115-24	2 x	0	0	0.00	0.0	0	0.00	0.0	0.00	0.0
49	NK	North Bangkok	69-12	2 x	40	13.70	17.83	41.6	12.75	16.75	45.6	16.75	45.6
			69-24	3 x	120	17.11	22.27	18.6	32.94	42.75	35.6	42.75	35.6
50	PE	Pakkred	69-12	2 x	80	38.36	49.93	62.4	36.60	46.34	57.2	46.34	57.2
			69-24	1 x	60	35.60	46.34	77.2	23.00	29.85	71.6	29.85	71.6
			115-12	1 x	0	0	0.00	0.0	0	0.00	0.0	0.00	0.0

Appendix 6.3-3 Load and Installed Capacity of Distribution Substations (MEA Original Plan, Planning Year = 1997 - 2001)

(5/21)

No.	ABB	Substation	Voltage (KV)	1998				1999				
				Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)
28	EX	Klongkrai	69-12	X	0	0	0.00	0.0	X	0	0.00	0.0
			69-24	1 X 40	40	22.69	29.42	73.6	X	40	23.60	30.58
29	SC	Klongsuanchai	69-12	1 X 40	(40)	42.12	55.01	68.8	1 X 40	40	15.55	20.15
			69-24	X	0	0.00	0.0	0.0	1 X 60	60	26.22	33.97
			115-24	X	0	0.00	0.0	0.0	X	0	0.00	0.0
30	AS	Klongsuanasmit	69-12	2 X 20	40	52.07	67.52	81.4	2 X 20	40	44.91	58.19
			69-24	X	0	0.00	0.0	0.0	X	0	0.00	0.0
31	RY	Klongsuan	69-12	X	0	0	0.00	0.0	X	0	0.00	0.0
			69-24	2 X 40	80	45.36	58.82	73.5	2 X 40	80	47.17	61.12
32	RT	Klongtoey	69-12	1 X 40	40	14.44	18.72	46.8	1 X 40	40	15.00	19.14
			69-24	1 X 40	40	20.00	25.93	64.8	1 X 40	40	20.82	26.98
33	TC	Klongkatsing	69-12	2 X 40	80	32.63	42.31	52.9	2 X 40	80	41.06	53.20
			69-24	X	0	0.00	0.0	0.0	X	0	0.00	0.0
34	RV	Krunai	69-12	1 X 40	(40)	33.20	43.05	53.8	1 X 40	(40)	34.53	44.74
			69-24	X	0	0.00	0.0	0.0	X	0	0.00	0.0
35	LK	Lardplakao	115-24	1 X 60	60	25.08	32.52	51.2	1 X 60	60	35.04	45.40
36	LP	Lardprao	69-12	2 X 40	80	33.56	43.52	54.4	1 X 40	40	14.90	19.31
			69-24	X	0	0.00	0.0	0.0	1 X 60	60	20.00	25.91
37	LA	Lumpini	69-12	4 X 40	160	91.04	118.05	73.8	4 X 40	160	94.68	122.68
			69-24	X	0	0.00	0.0	0.0	X	0	0.00	0.0
38	SK	Mahaissuan	69-12	2 X 40	80	18.07	23.43	29.3	2 X 40	80	18.60	24.10
			69-24	1 X 60	60	24.70	32.03	53.1	1 X 60	60	25.69	33.29
39	MA	Mahaack	69-12	2 X 40	(40)	65.93	86.79	72.3	2 X 40	(40)	69.61	90.20
			115-24	X	0	0.00	0.0	0.0	X	0	0.00	0.0
40	MA	Mai-ad	69-12	2 X 40	80	38.71	50.20	62.9	2 X 40	80	40.25	52.17
			69-24	X	0	0.00	0.0	0.0	X	0	0.00	0.0
41	MS	Makasan	69-12	2 X 40	(40)	69.91	90.65	75.5	2 X 40	(40)	72.71	94.21
			69-24	X	0	0.00	0.0	0.0	X	0	0.00	0.0
42	MB	Minburi	115-24	2 X 60	120	39.96	51.82	43.2	2 X 60	120	40.71	52.73
43	MC	Mechit	69-12	2 X 40	(40)	45.41	58.88	49.1	2 X 40	(40)	47.52	61.57
			69-24	X	0	0.00	0.0	0.0	X	0	0.00	0.0
44	MG	Muangmaim	115-24	2 X 60	120	51.69	67.03	55.9	2 X 60	120	53.76	69.66
45	MI	Muangthong 1	115-24	2 X 60	120	56.86	73.73	61.4	2 X 60	120	57.13	71.03
46	NI	Na-na	69-12	1 X 40	(40)	16.35	21.20	53.0	1 X 40	(40)	16.56	21.46
			69-24	2 X 60	120	24.57	31.86	26.6	2 X 60	120	26.00	33.69
			115-24	X	0	0.00	0.0	0.0	X	0	0.00	0.0
47	NI	Nongkham	69-12	X	0	0.00	0.0	0.0	X	0	0.00	0.0
			69-24	2 X 60	120	47.93	62.23	51.9	2 X 60	120	49.71	64.11
48	NR	Nonthaburi	69-12	X	0	0.00	0.0	0.0	X	0	0.00	0.0
			115-12	1 X 40	40	21.53	27.98	70.0	1 X 40	40	22.44	29.08
			115-24	1 X 60	60	29.36	36.40	44.0	1 X 60	60	29.17	37.80
49	NK	North Bangkok	69-12	X	0	0.00	0.0	0.0	X	0	0.00	0.0
			69-24	3 X 40	120	31.25	41.13	37.0	3 X 40	120	35.63	45.17
50	PE	Paikred	69-12	X	0	0.00	0.0	0.0	X	0	0.00	0.0
			69-24	X	0	0.00	0.0	0.0	X	0	0.00	0.0
			115-12	1 X 40	40	20.60	26.71	66.8	1 X 40	40	21.29	27.59

Appendix 6.3-3 Load and installed Capacity of Distribution Substations (MEA Original Plan, Planning Year = 1997 - 2001)

(6/21)

No.	ABB	Substation	Voltage (KV)	2000				2001						
				Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	
28	KV	Klongmai	69-12	X	0	0	0.00	0.0	X	X	0	0	0.00	0.0
			69-24	2 X	120	34.30	44.46	37.1	X	60	120	13.33	56.05	46.1
29	SC	Klongsaneuchai	69-12	1 X	40	16.02	20.77	51.9	X	40	40	16.49	21.33	53.3
			69-24	1 X	60	27.00	35.00	58.3	X	60	60	27.82	35.99	60.0
			115-24	X	0	0.00	0.00	0.0	X	X	0	0	0.00	0.0
30	KS	Klongkamsasmit	69-12	2 X	40	46.26	59.96	75.0	X	20	80	47.65	61.65	77.1
			69-24	X	0	0.00	0.00	0.0	X	X	0	0	0.00	0.0
31	KV	Klongsarn	69-12	X	0	0.00	0.00	0.0	X	X	0	0	0.00	0.0
			69-24	2 X	80	42.59	55.20	69.0	X	40	80	13.86	56.74	70.9
32	KT	Klongtoey	69-12	1 X	40	14.89	19.30	48.3	X	X	0	0	0.00	0.0
			69-24	1 X	40	22.00	28.52	71.3	X	40	80	38.00	49.16	61.5
33	WC	Klongratsing	69-12	2 X	80	43.94	56.95	71.2	X	X	0	0	0.00	0.0
			69-24	X	0	0.00	0.00	0.0	X	60	120	43.20	55.89	46.6
34	KU	Krunai	69-12	1 X	40	35.57	46.10	57.6	X	40	80	36.63	47.39	59.2
			69-24	X	0	0.00	0.00	0.0	X	X	0	0	0.00	0.0
35	LS	Lardplakao	115-24	1 X	60	35.85	46.47	77.5	X	60	60	21.69	31.91	53.2
36	LP	Lardprao	69-12	1 X	40	15.45	20.03	50.1	X	40	80	30.67	39.68	49.6
			69-24	1 X	60	20.50	26.57	41.3	X	60	60	18.36	23.75	39.6
37	LN	Lumpini	69-12	4 X	160	97.52	126.48	78.0	X	40	140	22.38	28.95	72.4
			69-24	X	0	0.00	0.00	0.0	X	40	140	71.70	92.76	66.3
38	KN	Maharisaran	69-12	1 X	40	14.47	18.76	46.9	X	X	0	0	0.00	0.0
			69-24	1 X	60	36.82	47.73	47.7	X	40	140	62.01	80.27	57.3
39	WK	Mahavek	69-12	2 X	40	71.70	92.94	77.5	X	X	0	0	0.00	0.0
			115-24	X	0	0.00	0.00	0.0	X	60	180	73.85	93.51	53.1
40	XA	Mai-ad	69-12	2 X	80	41.47	53.75	67.2	X	X	0	0	0.00	0.0
			69-24	X	0	0.00	0.00	0.0	X	40	80	42.71	55.26	69.1
41	XS	Makasan	69-12	2 X	40	64.09	83.07	69.2	X	40	80	41.99	54.33	67.9
			69-24	X	0	0.00	0.00	0.0	X	60	60	28.85	37.33	62.2
42	XB	Miburi	115-24	2 X	120	40.08	51.95	43.3	X	60	120	52.13	67.14	56.2
43	XC	Mochit	69-12	2 X	40	50.50	65.46	51.6	X	40	120	63.31	81.95	68.3
			69-24	X	0	0.00	0.00	0.0	X	X	0	0	0.00	0.0
44	XC	Muangmai	115-24	2 X	120	55.37	71.77	59.8	X	60	120	57.04	73.80	61.5
45	XI	Muangthong I	115-24	2 X	120	60.85	78.87	65.7	X	60	120	59.31	76.73	63.9
46	WN	Nu-na	69-12	1 X	40	17.00	22.04	55.1	X	40	40	16.99	21.98	55.0
			69-24	2 X	60	26.81	34.79	29.0	X	60	120	28.16	36.13	30.1
			115-24	X	0	0.00	0.00	0.0	X	X	0	0	0.00	0.0
47	NI	Nongkhae	69-12	2 X	0	0.00	0.00	0.0	X	X	0	0	0.00	0.0
			69-24	2 X	120	52.05	67.47	56.2	X	60	120	59.55	77.01	61.2
48	NR	Nranthaburi	69-12	X	0	0.00	0.00	0.0	X	X	0	0	0.00	0.0
			115-12	1 X	40	19.11	24.77	61.9	X	40	0	0	0.00	0.0
			115-24	1 X	60	45.05	58.38	97.3	X	60	120	63.05	81.15	70.1
49	NX	North Bangkok	69-12	X	0	0.00	0.00	0.0	X	X	0	0	0.00	0.0
			69-24	3 X	120	40.70	52.75	44.0	X	40	120	11.92	51.21	15.2
50	PE	Pakkred	69-12	X	0	0.00	0.00	0.0	X	X	0	0	0.00	0.0
			69-24	X	0	0.00	0.00	0.0	X	X	0	0	0.00	0.0
			115-12	X	0	0.00	0.00	0.0	X	X	0	0	0.00	0.0

Appendix 6.3-3. Load and Installed Capacity of Distribution Substations (MEA Original Plan, Planning Year = 1997 - 2001)

(7/21)

No.	ABU	Substation	Voltage (KV)	1996				1997						
				Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	
51	PK	Pakram	115-24	2 x 40	80	48.81	63.53	79.4	0.00	2 x 50	120	40.11	52.09	43.1
52	PS	Petchasom	69-24	1 x 40	40	41.76	58.26	68.7	0.00	1 x 40	80	19.67	61.16	76.0
53	PJ	Phaisingto	69-24	1 x 40	40	20.86	27.15	67.9	0.00	1 x 40	40	18.43	23.92	59.8
54	PJ	Poojoo	69-24	2 x 60	120	48.00	62.47	52.1	0.00	2 x 60	120	59.79	77.59	51.7
55	PC	Prachachuen	69-24	3 x 40	120	63.12	82.15	68.3	0.00	3 x 40	120	59.77	77.56	61.6
56	PK	Prakanong	69-24	2 x 40	80	38.35	49.91	62.4	0.00	2 x 40	80	40.20	52.17	65.2
57	PK	Prakasa	69-24	2 x 40	80	42.86	55.78	69.7	0.00	2 x 40	80	43.11	55.94	69.9
58	PO	Pramok	69-24	2 x 40	80	41.09	53.48	66.9	0.00	2 x 40	80	45.73	59.31	71.2
59	PD	Prapradang	69-24	3 x 40	120	58.20	75.75	63.1	0.00	3 x 40	120	50.71	65.85	51.9
60	PA	Prasamit	69-24	3 x 40	120	61.15	79.59	66.3	0.00	3 x 40	120	50.45	65.17	51.6
61	PM	Prathuan	69-24	3 x 40	120	65.10	84.73	70.6	0.00	3 x 40	120	65.71	85.27	71.1
62	RT	Rasindra	115-24	2 x 60	120	40.57	52.80	41.0	0.00	2 x 60	120	43.51	56.50	47.1
63	RI	Rakhaeng	69-24	2 x 40	80	52.12	67.84	48.5	0.00	2 x 40	80	55.08	71.45	51.0
64	RN	Rasurua	69-24	3 x 40	120	60.12	78.25	65.2	0.00	3 x 40	120	61.85	81.16	70.1
65	RK	Rook Loo	115-24	2 x 60	120	55.73	72.51	60.5	0.00	2 x 60	120	57.60	71.75	62.3
66	RC	Rongpracha	69-24	3 x 60	180	65.00	81.60	47.0	0.00	3 x 60	180	71.10	92.68	51.3
67	SM	Saiom	69-24	2 x 40	80	45.29	58.95	73.7	0.00	2 x 40	80	38.96	50.56	63.2
68	SR	Samrong	69-24	2 x 40	80	20.00	26.03	32.5	0.00	2 x 40	80	19.15	21.85	31.1
69	SN	Samsen	69-24	1 x 60	60	19.19	24.98	41.6	0.00	1 x 60	60	20.00	25.95	43.3
70	SS	Sansab	69-24	3 x 40	120	59.22	77.08	64.2	0.00	3 x 40	120	62.36	80.92	67.1
71	SD	Supandam	69-24	1 x 40	40	16.44	21.40	53.5	0.00	1 x 40	40	19.92	25.85	61.6
72	SP	Saparnai	69-24	2 x 60	120	51.70	67.29	56.1	0.00	2 x 60	120	46.31	60.10	56.1
73	SL	Silom	69-24	2 x 40	80	42.44	55.24	69.1	0.00	2 x 40	80	50.30	65.27	81.6
74	SV	Sipraya	69-24	2 x 40	80	41.06	53.44	66.8	0.00	2 x 40	80	11.35	53.66	67.1
75	SV	Somvijai	69-24	1 x 40	40	16.95	22.06	55.2	0.00	1 x 40	40	22.56	29.28	73.2
			69-24	2 x 60	120	43.43	56.53	47.1	0.00	2 x 60	120	45.39	58.99	49.1

No.	ABB	Substation	Voltage (KV)	1998				1999					
				Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)
51	PN	Paknaa	115-21	2 x 50	120	44.66	57.91	48.3	2 x 60	120	17.00	60.90	50.8
52	PS	Petchkasom	69-12	2 x 40	80	54.86	71.14	88.9	2 x 40	80	54.85	71.07	88.8
			69-21	1 x 40	22.4	51.66	66.99	79.0	1 x 40	22.4	53.72	69.61	82.1
53	PI	Praisinto	69-12	1 x 40	40	18.17	24.86	0.0	1 x 40	40	19.94	25.81	61.6
			69-21	2 x 60	120	52.18	67.66	56.1	2 x 60	120	51.67	70.81	59.0
54	PJ	Poojao	69-12	3 x 40	120	62.16	80.60	67.2	3 x 40	120	61.65	83.17	69.8
			69-21	1 x 40	40	0.00	0.00	0.0	1 x 40	40	0.00	0.00	0.0
55	PC	Prachachuen	69-12	2 x 40	80	34.11	44.23	55.3	2 x 40	80	35.46	45.95	57.1
			69-21	1 x 40	40	0.00	0.00	0.0	1 x 40	40	0.00	0.00	0.0
56	PK	Prakanong	69-12	1 x 40	40	25.00	32.42	81.1	1 x 40	40	28.77	37.28	93.2
			69-21	1 x 40	40	25.26	32.76	81.9	1 x 40	40	29.50	38.22	95.6
57	PK	Prakasa	115-21	2 x 40	140	61.03	79.14	56.5	2 x 40	140	63.51	82.29	58.8
58	PO	Pramok	69-12	2 x 40	80	47.56	61.67	77.1	2 x 40	80	49.46	61.09	80.1
			69-21	1 x 40	40	0.00	0.00	0.0	1 x 40	40	0.00	0.00	0.0
59	PD	Prapradang	69-12	3 x 40	120	55.01	71.33	59.4	3 x 40	120	49.76	64.18	53.7
			69-21	1 x 40	40	0.00	0.00	0.0	1 x 40	40	0.00	0.00	0.0
60	PA	Prasamit	69-12	2 x 40	80	41.79	54.19	67.7	2 x 40	80	41.00	53.13	66.1
			69-21	1 x 40	40	21.08	27.34	68.3	1 x 40	40	21.38	31.59	79.0
61	PK	Prathuan	69-12	3 x 40	120	54.58	70.77	59.0	3 x 40	120	65.16	81.43	70.1
			69-21	1 x 40	40	0.00	0.00	0.0	1 x 40	40	0.00	0.00	0.0
62	RT	Rasindra	115-21	2 x 60	120	45.36	58.82	48.0	2 x 60	120	46.26	59.61	50.0
63	RI	Rasbambang	69-12	2 x 40	80	55.14	71.50	51.1	2 x 40	80	57.30	74.25	53.0
			69-21	3 x 40	120	69.52	90.15	75.1	3 x 40	120	72.30	93.68	78.1
64	RK	Rasburaa	69-12	2 x 40	80	59.43	77.06	64.2	2 x 40	80	62.36	80.80	67.3
			69-21	3 x 60	180	72.33	93.79	52.1	3 x 60	180	74.17	96.19	52.6
65	RM	Ramkiao	69-12	2 x 40	80	38.71	50.20	62.8	2 x 40	80	40.51	52.53	65.7
			69-21	1 x 40	40	0.00	0.00	0.0	1 x 40	40	0.00	0.00	0.0
66	RC	Rongprachu	69-12	2 x 40	80	22.52	29.20	36.5	1 x 40	40	12.00	15.55	38.9
			69-21	1 x 60	60	11.00	14.26	23.8	2 x 60	120	25.82	38.61	32.2
67	SM	Sailom	69-12	3 x 40	120	65.05	81.95	70.3	3 x 40	120	67.87	87.91	73.3
			69-21	1 x 40	40	0.00	0.00	0.0	1 x 40	40	0.00	0.00	0.0
68	SK	Samrong	69-12	1 x 40	40	20.71	26.86	67.1	1 x 40	40	21.54	27.91	69.8
			69-21	2 x 40	80	41.52	53.61	67.3	2 x 40	80	43.18	55.95	69.9
69	SN	Saen	69-12	4 x 40	160	93.52	121.27	75.8	4 x 40	160	96.72	125.32	78.3
			69-21	2 x 60	120	48.16	62.45	52.0	2 x 60	120	50.09	61.90	51.1
70	SS	Sonsab	69-12	2 x 40	80	47.31	61.95	76.7	2 x 40	80	46.10	60.12	75.2
			69-21	1 x 40	40	0.00	0.00	0.0	1 x 40	40	0.00	0.00	0.0
71	SD	Sipandun	69-12	2 x 40	80	42.21	54.73	68.1	2 x 40	80	36.79	51.56	61.5
			69-21	1 x 40	40	0.00	0.00	0.0	1 x 40	40	0.00	0.00	0.0
72	SP	Supannei	69-12	2 x 40	80	23.47	30.43	76.1	1 x 40	40	25.10	32.91	82.3
			69-21	2 x 60	120	47.21	61.22	51.0	2 x 60	120	52.10	67.51	56.3

Appendix 6.3-3 Load and Installed Capacity of Distribution Substations (MEA Original Plan, Planning Year = 1997 - 2001)

(9/21)

No	Substation	Voltage (KV)	2000				2001					
			Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)
51	PN Pahom	115-21	3 x 60	180	70.34	91.17	50.7	3 x 60	180	72.45	93.73	52.1
52	PS Petchakasem	69-21	2 x 40	80	55.35	73.04	91.3	3 x 60	180	50.89	65.81	36.6
53	PT Phaisangto	69-12	1 x 40	40	41.31	53.58	63.2	2 x 22.4	44.8	25.71	33.30	74.3
54	PJ Poojao	69-21	1 x 40	40	0.00	0.00	0.0	1 x 40	40	16.81	21.79	51.5
55	PC Prachuen	69-12	1 x 40	40	17.15	22.23	55.6	3 x 60	180	89.76	116.13	64.5
56	PK Prakanong	69-21	2 x 60	120	70.00	90.73	75.6	3 x 60	180	0	0.00	0.0
57	PR Prakhue	69-12	3 x 40	120	69.59	90.20	75.2	3 x 40	120	76.82	99.39	82.8
58	PO Pramok	69-21	2 x 40	80	36.54	47.36	56.2	3 x 40	120	37.63	48.58	48.7
59	PD Prapradung	69-12	2 x 40	80	28.68	37.17	92.9	1 x 40	40	0	0.00	0.0
60	PA Prasarnmit	69-21	1 x 40	40	27.31	35.44	88.6	2 x 40	80	40.19	52.00	65.0
61	PN Prathuan	69-12	2 x 40	80	65.44	84.82	60.6	2 x 40	80	68.11	89.55	63.3
62	RT Ramintra	69-21	1 x 40	40	22.59	29.28	73.2	3 x 40	120	35.64	46.11	37.6
63	RI Rakhambang	69-12	1 x 40	40	12.01	15.57	38.9	2 x 40	80	58.08	73.16	62.6
64	RY Rasburana	69-21	3 x 40	120	51.40	66.62	55.5	3 x 40	120	41.02	56.85	47.5
65	RK Rakhiao	69-21	2 x 40	80	0.00	0.00	0.0	2 x 60	120	0	0.00	0.0
66	RC Rungprachu	69-12	3 x 40	120	61.00	79.07	65.9	3 x 40	120	62.83	81.29	67.7
67	SN Saitom	69-21	3 x 40	120	67.12	87.00	72.5	1 x 40	40	23.81	30.81	77.0
68	SR Sawring	69-12	3 x 40	120	48.74	64.47	69.6	2 x 40	80	45.32	58.63	73.3
69	SN Samsen	69-21	2 x 60	120	55.65	72.13	60.1	2 x 60	120	56.05	72.52	60.4
70	SS Samsub	69-12	2 x 40	80	0.00	0.00	0.0	3 x 40	120	75.50	97.68	81.6
71	SP Sapandua	69-21	3 x 40	120	78.43	101.66	56.5	2 x 40	80	50.41	65.25	81.6
72	SP Sapamei	69-12	2 x 40	80	42.97	55.70	69.6	2 x 40	80	0	0.00	0.0
73	SL Silom	69-21	1 x 40	40	12.82	16.62	41.5	3 x 60	180	61.91	80.10	44.5
74	SY Sipraya	69-12	2 x 60	120	38.25	49.58	41.3	2 x 40	80	41.21	53.32	66.7
75	SV Soovijai	69-21	3 x 40	120	57.67	74.75	62.3	2 x 40	80	23.31	30.20	75.5
		69-12	1 x 40	40	20.00	25.92	64.8	1 x 40	40	18.88	24.10	61.0
		69-21	2 x 40	80	46.66	60.48	75.6	2 x 40	80	41.81	54.09	67.6
		69-12	4 x 40	160	98.12	127.18	79.5	4 x 40	160	81.58	109.13	68.1
		69-12	2 x 40	80	0.00	0.00	0.0	2 x 60	120	53.11	68.75	57.3
		69-21	2 x 60	120	51.59	66.87	55.7	2 x 60	120	49.47	64.00	80.0
		69-12	2 x 40	80	43.03	55.77	69.7	2 x 40	80	21.02	27.20	68.0
		69-21	2 x 40	80	40.98	53.12	66.4	2 x 40	80	21.19	27.12	68.5
		69-12	2 x 40	80	23.76	30.80	77.0	1 x 40	40	22.95	29.69	71.2
		69-21	2 x 60	120	60.00	77.77	61.8	2 x 60	120	51.73	70.81	59.0

Appendix 6.3-3 Load and Installed Capacity of Distribution Substations (MEA Original Plan, Planning Year = 1997 - 2001)

(10/21)

No.	ABB	Substation	Voltage (KV)	1996				1997						
				Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	
76	SK	South Bangkok	69-12 69-24	2 x 20 x	40	11.51	14.98	37.5	0.0	2 x 20 x	40	12.16	15.78	39.5
77	ST	South Thonburi	69-12 69-24	2 x (40) x	80	39.98	52.04	65.1	0.0	2 x (40) x	80	42.79	55.53	69.4
78	VA	Srithanya	69-12 115-12 115-24	1 x (40) x x	40	20.61	26.83	67.1	0.0	1 x (40) x x	40	27.21	35.31	88.3
79	SO	Swanson	69-12 69-24	2 x 40 x	80	38.04	49.51	61.9	0.0	2 x 40 x	80	46.29	60.07	75.1
80	SU	Surawong	69-12 69-24	3 x 40 x	120	60.74	79.06	65.9	0.0	3 x 40 x	120	67.42	87.19	72.9
81	TS	Taksin	69-12 69-24	1 x 40 x	40	18.68	24.31	60.8	0.0	1 x 40 x	40	20.63	26.77	66.9
82	TP	Teparak	69-24	1 x 40	40	16.09	20.83	52.1	0.0	1 x 40	40	19.00	21.66	51.6
83	TT	Thanontok	69-12 69-24	2 x 40 x	140	77.54	100.92	72.1	0.0	2 x 40 x	140	68.71	89.16	62.7
84	TB	Thonburi	69-12 69-24	2 x 40 x	80	44.00	57.27	71.6	0.0	2 x 40 x	80	38.09	49.43	61.8
85	TK	Tongkung	69-12 69-24	2 x 40 x	80	41.63	54.18	67.7	0.0	2 x 40 x	80	43.26	56.14	70.2
86	WB	Wangpetchaboon	69-12 69-24	2 x 40 x	80	56.60	73.67	92.1	0.0	2 x 40 x	80	49.71	64.51	80.6
87	WT	Wangthonglang	69-12	x	0	0.00	0.00	0.0	0.0	x	0	0.00	0.00	0.0
88	XL	Patliob	69-12	3 x 60	180	61.73	84.25	46.8	0.0	3 x 60	180	70.72	91.77	51.0
89	YT	Yothec	69-12 69-24	3 x 40 x	120	64.34	83.74	69.8	0.0	3 x 40 x	120	69.63	90.36	75.3
90	BE	Bungke	69-12 115-12 115-24	2 x 40 x x	80	34.63	45.07	56.3	0.0	2 x 40 x x	80	39.92	51.80	61.8
91	BZ	Bangson	69-12 69-24	1 x (40) x	40	32.00	41.85	104.1	0.0	2 x (40) x	80	33.01	42.88	53.6
92	R1	Bearing	69-24 115-24	1 x 60 x	60	44.05	57.33	95.6	0.0	2 x 60 x	120	50.51	65.55	51.6
93	EX	Ekamai	69-12 69-24	1 x (40) x	40	30.31	39.45	98.6	0.0	2 x (40) x	80	40.97	53.17	66.5
94	EB	Ebbersi	115-24	1 x 60	60	16.00	20.83	34.7	0.0	1 x 60	60	18.00	23.36	38.9
95	HA	Huamak	69-12 69-24	1 x 40 x	40	19.51	25.39	63.5	0.0	1 x 40 x	40	22.28	28.91	72.3
96	IN	Intawra	69-24	2 x 60	120	36.03	46.90	39.1	0.0	2 x 60	120	40.10	52.01	43.1
97	JR	Jankron	69-12 69-24	1 x (40) x	40	16.33	21.25	53.1	0.0	1 x (40) x	40	17.68	22.91	57.1
98	KO	Khoton	115-24	1 x 60	60	40.46	52.66	87.8	0.0	2 x 60	120	45.99	59.68	49.7
99	KI	Kingkaew	115-24	2 x 60	120	40.47	52.67	43.9	0.0	2 x 60	120	41.83	51.28	45.2

Appendix 6.3-3 Load and Installed Capacity of Distribution Substations (WEA Original Plan, Planning Year = 1997 - 2001)

(11/21)

No.	ABB	Substation	Voltage (KV)	1998				1999					
				Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)
76	SK	South Bangkok	69-12	2 x 20	40	12.65	16.40	41.0	2 x 20	40	14.15	18.33	45.8
			69-21	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
77	ST	South Thonburi	69-12	2 x (40)	80	44.30	57.44	71.8	1 x (40)	40	21.78	28.22	70.6
			69-21	x	0	0.00	0.00	0.0	1 x 60	60	26.09	33.81	56.3
78	VA	Sriphanva	69-12	1 x (40)	40	28.09	36.42	91.1	x	0	0.00	0.00	0.0
			115-12	x	0	0.00	0.00	0.0	1 x (40)	40	20.38	26.11	66.0
			115-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
79	SD	Samsow	69-12	2 x 40	80	48.44	62.81	78.5	2 x 40	80	50.06	61.86	81.1
			69-21	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
80	SU	Surawong	69-12	3 x 40	120	69.30	89.86	74.9	3 x 40	120	65.71	85.11	71.0
			69-21	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
81	TS	Taksin	69-12	1 x 40	40	19.21	24.91	62.3	x	0	0.00	0.00	0.0
			69-21	1 x 40	40	22.00	28.53	71.3	2 x 40	80	42.85	55.51	69.1
82	TP	Teparak	69-24	2 x 40	80	71.46	92.66	66.2	2 x 40	80	74.32	96.30	68.8
83	TT	Thaeontok	69-12	1 x 40	40	43.31	56.16	70.2	1 x 40	40	45.11	58.19	73.1
			69-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
84	TB	Thonburi	69-12	2 x 40	80	35.01	45.40	56.8	2 x 40	80	18.01	23.31	29.2
			69-21	1 x 60	60	23.23	30.12	50.2	1 x 60	60	42.76	55.11	92.3
85	TK	Tongkung	69-12	2 x 40	80	44.99	58.91	72.9	2 x 40	80	46.90	60.77	76.0
			69-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
86	TB	Fangpetcha boon	69-12	2 x 40	80	51.70	67.04	83.8	2 x 40	80	63.70	82.51	109.2
			69-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
87	TT	Fangthongtang	69-12	3 x 60	180	74.56	96.68	53.7	3 x 60	180	67.86	87.93	48.9
			69-24	3 x 40	120	72.26	93.70	78.1	3 x 40	120	75.98	98.15	82.0
88	WL	Watlich	69-12	2 x 40	80	41.52	53.84	67.3	2 x 40	80	43.18	55.95	69.9
			69-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
89	YT	Yotbec	69-12	1 x 40	40	30.42	39.45	98.6	x	0	0.00	0.00	0.0
			115-12	x	0	0.00	0.00	0.0	2 x (40)	80	41.61	53.95	67.1
			115-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
90	BE	Bangkac	69-12	2 x (40)	80	37.16	48.19	60.2	1 x (40)	40	21.37	31.58	78.9
			69-24	x	0	0.00	0.00	0.0	1 x 60	60	23.92	30.99	51.7
91	BZ	Bangson	69-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
92	R1	Rouring	69-24	2 x 60	120	52.73	68.38	57.0	2 x 60	120	55.01	71.32	59.1
			115-24	1 x (40)	40	21.81	28.28	70.7	1 x (40)	40	22.68	29.39	73.5
93	EL	Ekamai	69-21	2 x 60	120	54.77	71.02	59.2	2 x 60	120	56.97	73.82	61.5
			115-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
94	EB	Ekburri	115-24	1 x 60	60	20.51	26.63	44.4	1 x 60	60	21.36	27.63	46.1
			69-12	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
95	HA	Huamak	69-21	1 x 40	40	23.17	30.05	75.1	1 x 40	40	20.10	26.01	65.1
			115-21	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
96	IN	Intamara	69-24	2 x 60	120	41.71	51.09	45.1	2 x 60	120	43.37	56.20	46.8
			69-12	1 x (40)	40	18.89	23.85	59.6	1 x (40)	40	19.13	21.79	62.0
97	JR	Jankrin	69-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
98	KD	Khotor	115-21	2 x 60	120	48.03	62.28	51.9	2 x 60	120	50.15	61.98	54.2
99	KI	Kingkaw	115-24	2 x 60	120	42.50	55.11	45.9	2 x 60	120	50.21	65.10	51.3

Appendix 6.3-3 Load and Installed Capacity of Distribution Substations (MEA Original Plan, Planning Year = 1997 - 2001)

(12/21)

No.	ABB	Substation	Voltage (KV)	2000				2001					
				Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)
76	SK	South Bangkok	69-12	2 x 20	40	14.58	18.90	47.3	0	0	0.00	0.00	0.0
			69-24	x	0	0	0.00	0.0	1 x 40	40	15.02	19.13	48.6
77	ST	South Thonburi	69-12	x	0	0	0.00	0.0	x	0	0	0.00	0.0
			69-24	x	0	0	0.00	0.0	x	0	0	0.00	0.0
78	YA	Sri thanya	69-12	x	0	0	0.00	0.0	x	0	0	0.00	0.0
			115-12	1 x (40)	40	30.41	39.42	98.5	1 x (40)	40	19.12	21.71	61.8
			115-24	x	0	0	0.00	0.0	x	0	0	0.00	0.0
79	SO	Samsorn	69-12	2 x 40	80	51.57	66.84	83.6	x	0	0	0.00	0.0
			69-24	x	0	0	0.00	0.0	2 x 60	120	55.11	71.30	59.4
80	SU	Surawong	69-12	3 x 40	120	67.68	87.72	73.1	1 x 40	40	23.51	30.12	76.0
			69-24	x	0	0	0.00	0.0	2 x 60	120	46.20	59.77	49.8
81	TS	Taksin	69-12	x	0	0	0.00	0.0	x	0	0	0.00	0.0
			69-24	2 x 40	80	44.15	57.23	71.5	2 x 40	80	37.47	48.48	60.6
82	TP	Togarak	69-24	2 x 40	80	58.55	88.85	63.3	2 x 40	80	70.60	91.31	65.2
83	TT	Thaonok	69-12	1 x 40	40	46.39	60.13	75.2	x	0	0	0.00	0.0
			69-24	x	0	0	0.00	0.0	2 x 60	120	47.79	61.83	51.5
84	TB	Thonburi	69-12	2 x 40	80	19.21	24.90	31.1	2 x 40	80	42.45	51.92	68.7
			69-24	1 x 60	60	48.59	62.98	105.0	1 x 60	60	29.45	38.10	53.5
85	TK	Tongkang	69-12	2 x 40	80	40.19	52.09	65.1	x	0	0	0.00	0.0
			69-24	x	0	0	0.00	0.0	2 x 40	80	41.40	53.56	67.0
86	TB	Thongphaboon	69-12	2 x 40	80	65.74	85.21	71.0	x	0	0	0.00	0.0
			69-24	x	0	0	0.00	0.0	3 x 60	180	69.77	90.27	50.2
87	TT	Tongthonglang	69-12	x	0	0	0.00	0.0	x	0	0	0.00	0.0
			69-24	3 x 60	180	69.90	90.60	50.3	3 x 60	180	72.00	93.15	51.8
88	TL	Tatlieb	69-12	3 x 40	120	79.87	103.52	86.3	3 x 40	120	66.82	86.15	72.0
89	VT	Volbec	69-12	2 x 40	80	44.48	57.65	72.1	2 x 40	80	41.81	54.09	67.6
			69-24	x	0	0	0.00	0.0	x	0	0	0.00	0.0
90	BE	Buangkue	69-12	x	0	0	0.00	0.0	x	0	0	0.00	0.0
			115-12	2 x (40)	80	51.22	66.39	83.0	1 x (40)	40	22.52	29.11	72.8
			115-24	x	0	0	0.00	0.0	1 x 60	60	30.21	39.12	65.2
91	BZ	Bangson	69-12	1 x (40)	40	26.80	34.74	86.8	x	0	0	0.00	0.0
			69-24	1 x 60	60	28.64	37.12	61.9	2 x 60	120	42.80	55.37	45.1
92	RI	Bearing	69-24	x	0	0	0.00	0.0	x	0	0	0.00	0.0
			115-24	2 x 60	120	56.84	73.67	61.1	2 x 60	120	63.69	82.10	68.7
93	EN	Ekamai	69-12	1 x (40)	40	21.67	28.09	70.2	1 x (40)	40	19.91	25.80	64.5
			69-24	2 x 60	120	58.00	75.18	62.7	2 x 60	120	62.12	80.37	67.0
			115-24	x	0	0	0.00	0.0	x	0	0	0.00	0.0
94	EB	ERBuri	115-24	2 x 60	120	30.00	38.89	32.4	2 x 60	120	41.20	53.30	41.1
95	MA	Maenak	69-12	x	0	0	0.00	0.0	x	0	0	0.00	0.0
			69-24	1 x 40	40	20.70	26.83	67.1	1 x 40	40	21.32	27.58	69.0
			115-24	x	0	0	0.00	0.0	x	0	0	0.00	0.0
96	IN	Intamara	69-24	2 x 60	120	44.68	57.91	48.3	2 x 60	120	46.02	59.51	49.6
97	JR	Jangron	69-12	1 x (40)	40	23.70	30.72	76.8	1 x (40)	40	21.41	31.58	79.0
			69-24	x	0	0	0.00	0.0	x	0	0	0.00	0.0
98	MO	Mahaor	115-24	2 x 60	120	51.08	66.21	55.2	2 x 60	120	71.51	96.10	53.6
99	KI	Kingkavee	115-24	2 x 60	120	52.84	68.49	57.1	2 x 60	120	56.79	73.17	61.2

Appendix 6.3-3 Load and Installed Capacity of Distribution Substations (MEA Original Plan, Planning Year = 1997 - 2001)

No	Abb	Substation	Voltage (KV)	1996				1997					
				Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)
100	KH	Klongmaharand	115-21	2 x 60	120	41.20	53.52	44.7	2 x 60	120	41.99	58.38	48.7
101	LB	Lardkrabong	115-21	2 x 60	120	31.98	41.62	34.7	2 x 60	120	40.65	52.75	44.0
102	W3	Wangthong 3	69-12	1 x 60	60	34.00	44.25	73.8	2 x 60	120	42.06	51.56	45.3
103	NS	Nesecc	69-12	2 x (40)	80	30.69	39.94	49.9	2 x (40)	80	33.67	43.69	51.6
			69-21	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
104	PP	Pradipat	69-12	2 x (40)	80	37.76	49.15	61.4	2 x (40)	80	37.88	48.18	61.5
			69-21	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
105	SA	Saimonitip	69-12	x	0	0.00	0.00	0.0	1 x (40)	40	18.23	23.66	59.1
			69-24	1 x 60	60	36.54	47.56	79.3	1 x 60	60	22.00	28.55	47.6
			115-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
106	SB	Suanbinnam	69-12	1 x (40)	40	20.22	26.32	65.8	x	0	0.00	0.00	0.0
			69-24	1 x 60	60	18.00	23.43	39.1	x	0	0.00	0.00	0.0
			115-12	x	0	0.00	0.00	0.0	1 x (40)	40	25.01	32.46	81.1
			115-24	x	0	0.00	0.00	0.0	1 x 60	60	20.90	25.95	43.3
107	BC	Bangchong	115-24	1 x 60	60	23.16	30.14	50.2	1 x 60	60	25.06	32.32	54.2
108	OB	South BangDlee	115-24	1 x 60	60	36.22	47.14	78.6	2 x 60	120	40.63	52.73	43.9
109	SE	Srieauw	115-24	2 x 60	120	42.13	54.83	45.7	2 x 60	120	60.69	78.78	65.6
110	SC	Suanluang	69-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
			115-24	3 x 60	180	78.55	102.24	56.8	3 x 60	180	65.01	81.40	46.9
111	UK	Surasak	69-12	1 x (40)	40	24.34	31.68	79.2	2 x (40)	80	37.86	49.13	61.4
			69-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
112	TN	Taiban	115-24	x	0	0.00	0.00	0.0	1 x 60	60	22.28	28.91	48.2
113	TP	Turewatiana	115-24	1 x 60	60	20.44	26.60	44.3	1 x 60	60	22.28	28.91	48.2
114	TR	Thonburiron	69-12	1 x (40)	40	21.00	27.33	68.3	1 x (40)	40	28.08	36.44	81.1
			115-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
115	TH	Tungsonghong	69-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
			115-24	2 x 60	120	34.20	44.51	37.1	2 x 60	120	43.95	57.03	47.5
116	YK	Yenabhart	69-12	2 x (40)	80	45.60	59.35	74.2	2 x (40)	80	44.55	57.81	72.3
			69-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
117	AB	Bangbor	115-24	1 x 60	60	16.10	20.96	34.9	2 x 60	120	20.00	25.95	21.6
118	JK	Bangjak	69-12	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
			115-12	1 x (40)	40	16.32	21.24	53.1	1 x (40)	40	13.00	16.87	42.2
			115-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
119	XD	Bangkrudee	69-12	1 x (40)	40	12.10	15.75	39.4	1 x (40)	40	11.50	11.92	37.3
			115-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
120	BH	Bangshun	115-24	1 x 60	60	17.18	22.36	37.3	1 x 60	60	17.82	23.13	38.5
121	WI	Winnai	69-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
122	DD	Ditadong	69-12	x	0	0.00	0.00	0.0	1 x (40)	40	17.36	22.53	56.3
			115-12	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
			115-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
123	EC	Ekachai	69-12	1 x (40)	40	10.40	13.54	33.8	1 x (40)	40	11.00	11.28	35.7
			115-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
124	GK	Ghakhlang	69-24	1 x 60	60	16.00	20.83	34.7	2 x 60	120	17.00	22.06	18.1
			115-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
125	JW	Jangwataum	115-24	1 x 60	60	42.37	55.93	93.2	2 x 60	120	46.36	60.16	50.1
126	JJ	Jatujak	69-12	x	0	0.00	0.00	0.0	2 x (40)	80	20.00	25.95	32.1

No	ABB	Substation	Voltage (KV)	1998				1999					
				Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)
100	KII	Klongbasavard	115-21	2 x 60	120	50.90	86.00	55.0	2 x 60	120	52.82	88.11	57.0
101	LB	Lardkrabung	115-24	2 x 60	120	48.28	92.61	52.2	2 x 60	120	43.21	55.99	46.7
102	M3	Meangthong 3	115-24	2 x 60	120	54.14	70.20	58.5	2 x 60	120	56.31	72.96	60.8
103	NS	Nonsice	69-12	1 x (40)	40	15.79	20.48	51.2	1 x (40)	40	11.29	14.55	56.1
			69-24	1 x 60	60	20.10	26.06	43.4	1 x 60	60	26.10	33.82	56.4
104	PP	Pradipat	69-12	2 x (40)	80	38.59	50.04	62.6	2 x (40)	80	42.17	51.61	68.3
			69-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
105	SA	Saimuaitip	69-12	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
			69-24	2 x 60	120	41.84	54.25	45.2	2 x 60	120	43.32	56.39	47.0
			115-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
106	SB	Suanbinnak	69-12	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
			69-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
			115-12	1 x (40)	40	20.49	26.57	66.4	1 x (40)	40	23.05	29.87	74.7
			115-24	1 x 60	60	26.32	34.13	56.9	1 x 60	60	29.63	38.39	64.0
107	SC	Sorabong	115-24	1 x 60	60	26.30	34.10	56.3	1 x 60	60	31.36	40.63	67.7
108	OB	South Bangphee	115-24	2 x 60	120	42.46	55.06	45.9	2 x 60	120	44.35	57.47	47.9
109	SE	Sreitan	115-24	2 x 60	120	68.32	88.59	73.8	2 x 60	120	71.05	92.06	76.7
110	SG	Suanluang	69-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
			115-24	3 x 60	180	63.44	82.26	45.7	3 x 60	180	61.58	79.79	44.3
111	UK	Surasak	69-12	2 x (40)	80	40.77	52.87	66.1	2 x (40)	80	43.00	55.72	69.7
			69-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
112	TS	Taiban	115-24	1 x 60	60	26.17	33.94	56.6	1 x 60	60	33.22	43.01	71.7
113	TV	Taveattana	115-24	2 x 60	120	42.52	53.14	46.0	2 x 60	120	50.34	65.23	54.1
114	TR	Thamburira	69-12	2 x (40)	80	35.20	45.64	57.1	2 x (40)	80	40.61	52.62	65.8
			115-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
115	TH	Tungsongthong	69-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
			115-24	2 x 60	120	37.39	48.48	40.4	2 x 60	120	38.89	50.39	42.0
116	YK	Yenarkart	69-12	2 x (40)	80	47.34	61.39	76.7	2 x (40)	80	49.20	63.75	79.7
			69-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
117	AB	Bangbor	115-24	2 x 60	120	22.23	28.83	21.0	2 x 60	120	23.12	29.95	25.0
118	JK	Bangjak	69-12	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
			115-12	1 x (40)	40	12.36	16.03	40.1	1 x (40)	40	12.85	16.65	41.6
			115-21	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
119	BD	Bongkradee	69-12	1 x (40)	40	12.00	15.56	38.9	1 x (40)	40	17.35	22.18	18.7
			115-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
120	BH	Bangshan	115-24	2 x 60	120	26.35	34.17	28.5	2 x 60	120	35.61	46.11	38.3
121	RI	Ramai	69-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
122	DO	Dindaeng	69-12	1 x (40)	40	18.85	24.44	61.1	1 x (40)	40	19.61	25.11	63.5
			115-12	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
			115-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
123	EC	Ekachai	69-12	1 x (40)	40	13.00	16.86	42.1	1 x (40)	40	15.00	19.11	32.1
			115-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
124	GK	Gaxakiang	69-24	2 x 60	120	18.71	24.26	20.2	2 x 60	120	31.36	41.32	37.1
125	JF	Jongratana	115-24	2 x 60	120	59.49	77.14	61.3	2 x 60	120	59.87	77.58	61.7
126	JJ	Jatujug	69-12	2 x (40)	80	25.00	32.42	40.5	2 x (40)	80	29.00	37.38	47.0

Appendix 6.3-3 Load and Installed Capacity of Distribution Substations (WEA Original Plan, Planning Year = 1997 - 2001)

No	ABD	Substation	Voltage (KV)	2000				2001				
				Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)
100	NH	Klongbassuad	115-24	2 x 60	120	50.41	63.34	54.3	120	51.92	61.17	56.0
101	LB	Lardkrabang	115-24	2 x 60	120	46.72	60.56	50.3	120	49.27	63.71	53.1
102	N2	Buangthong 3	115-24	2 x 60	120	58.00	75.18	62.7	120	60.74	78.38	63.5
103	NS	Nonsae	69-12	1 x (40)	40	11.56	14.98	37.5	0	0	0.00	0.0
			69-24	1 x 60	60	26.88	34.84	58.1	120	39.60	51.23	12.7
104	PP	Pradipat	69-12	2 x (40)	80	60.25	78.09	97.6	1 x (40)	22.25	28.79	72.0
			69-24	1 x 60	60	0	0.00	0.0	1 x 60	31.07	10.20	67.0
105	SA	Sainatip	69-12	1 x 60	60	0	0.00	0.0	1 x 60	0	0.00	0.0
			69-24	2 x 60	120	48.82	63.28	52.7	3 x 60	62.29	80.39	41.8
			115-24	1 x 60	60	0	0.00	0.0	1 x 60	0	0.00	0.0
106	SB	Suanbinnan	69-12	1 x 60	60	0	0.00	0.0	1 x 60	0	0.00	0.0
			69-24	1 x (40)	40	23.75	30.78	77.0	1 x 60	0	0.00	0.0
			115-12	1 x 60	60	30.51	39.55	65.9	2 x 60	55.89	72.31	60.3
107	SC	Suorahong	115-24	1 x 60	60	24.30	31.50	52.3	1 x 60	25.02	32.37	51.0
108	SE	South Bangploe	115-24	2 x 60	120	49.83	64.59	53.8	2 x 60	56.18	73.07	60.9
109	SF	Sriejam	115-24	2 x 60	120	83.18	107.82	89.9	3 x 60	85.68	110.85	61.6
110	SG	Suanluang	69-24	1 x 60	60	0	0.00	0.0	1 x 60	0	0.00	0.0
			115-24	3 x 60	180	59.82	77.54	43.1	3 x 60	56.17	73.06	40.6
111	SK	Sarasak	69-12	2 x (40)	80	47.75	61.89	77.1	1 x 60	0	0.00	0.0
			69-24	1 x 60	60	0	0.00	0.0	2 x 60	31.90	45.15	37.6
112	TK	Taiban	115-24	2 x 60	120	60.57	78.51	65.1	2 x 60	62.39	80.72	67.3
113	TP	Taveattana	115-24	2 x 60	120	54.47	70.60	58.8	2 x 60	61.26	79.26	66.1
114	TR	Thonburiron	69-12	2 x (40)	80	41.82	54.21	67.8	2 x (40)	43.08	55.71	69.7
			115-24	1 x 60	60	0	0.00	0.0	1 x 60	0	0.00	0.0
115	TH	Tungsohong	69-24	1 x 60	60	0	0.00	0.0	1 x 60	0	0.00	0.0
			115-24	2 x 60	120	40.05	51.91	43.3	2 x 60	41.26	53.38	41.5
116	YK	Yenachart	69-12	2 x (40)	80	50.61	65.64	82.1	1 x 60	0	0.00	0.0
			69-24	1 x 60	60	0	0.00	0.0	2 x 60	55.13	71.33	59.1
117	AB	Bangbar	115-24	2 x 60	120	41.81	54.19	45.2	2 x 60	43.07	55.72	46.1
118	JK	Bangjak	69-12	1 x (40)	40	12.64	16.38	41.0	1 x (40)	13.02	16.85	42.1
			115-24	1 x 60	60	18.60	24.11	40.2	1 x 60	19.16	24.79	41.3
119	KP	Bangkradec	69-12	1 x 60	60	0	0.00	0.0	1 x 60	0	0.00	0.0
			115-24	2 x 60	120	22.72	29.15	24.5	2 x 60	35.28	45.61	38.0
120	BL	Bangshan	115-24	2 x 60	120	36.68	47.51	39.6	2 x 60	37.78	48.88	40.7
121	MI	Bunmai	69-24	1 x 60	60	0	0.00	0.0	2 x 60	28.39	36.73	30.6
122	DB	Dinduang	69-12	2 x (40)	80	40.20	52.11	65.1	2 x (40)	45.10	58.71	73.1
			115-24	1 x 60	60	0	0.00	0.0	1 x 60	0	0.00	0.0
123	EC	Etachai	69-12	1 x 60	60	0	0.00	0.0	1 x 60	0	0.00	0.0
			115-24	2 x 60	120	17.00	22.04	36.7	2 x 60	21.35	31.50	26.3
124	CK	Choklang	69-24	2 x 60	120	35.39	45.87	38.2	2 x 60	18.15	24.68	24.2
			115-24	1 x 60	60	0	0.00	0.0	1 x 60	0	0.00	0.0
125	JF	Jangyatana	115-24	2 x 60	120	51.67	79.93	66.6	2 x 60	59.52	77.01	61.2
126	JJ	Jatujag	69-12	2 x (40)	80	34.00	44.07	55.1	2 x (40)	34.00	44.07	55.1

No	ABB	Substation	Voltage (KV)	1996				1997					
				Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)
			69-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
			115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
127	AE	Kaset	69-12	X	0	0	0.00	0.0	X	0	0	0.00	0.0
			69-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
128	AG	Klongkum	115-24	X	0	0	0.00	0.0	1	60	22.00	28.55	17.6
129	AL	Klongprapa	115-24	1	60	8.24	10.73	17.9	1	60	12.00	15.37	26.0
130	AO	Mitr-adorn	69-12	1	40	26.16	34.05	85.1	1	40	10.00	12.98	32.1
			69-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
131	AI	Muangthong 4	115-24	X	0	0	0.00	0.0	1	60	28.56	37.05	61.8
132	AK	Muangthong 5	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
133	AM	Muangthong 6	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
134	AN	Muangthong 7	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
135	AO	Nanglerng	69-12	X	0	0	0.00	0.0	X	0	0	0.00	0.0
136	TA	Patanakarn	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
137	PL	Plubpla	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
138	PI	Prases	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
139	RP	Prasong	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
140	SI	Sainoi	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
141	YA	Sanyarn	115-12	X	0	0	0.00	0.0	1	40	20.00	25.95	61.9
			115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
142	SI	Satarn	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
143	RP	Shiapi	115-24	X	0	0	0.00	0.0	1	60	16.35	21.22	35.4
144	SV	Sriwng	69-12	X	0	0	0.00	0.0	X	0	0	0.00	0.0
			69-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
145	YI	Sunyai	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
146	WV	Swinawong	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
147	TI	Tha-wian	69-12	X	0	0	0.00	0.0	X	0	0	0.00	0.0
			69-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
148	TC	Trochan	115-12	X	0	0	0.00	0.0	1	40	6.00	7.79	19.5
			115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
149	TY	Tubkao	115-24	X	0	0	0.00	0.0	1	60	13.00	16.87	28.1
150	TK	Tatkapasong	69-12	X	0	0	0.00	0.0	1	40	12.00	15.57	38.9
			69-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
151	TK	Tutakart	69-12	X	0	0	0.00	0.0	X	0	0	0.00	0.0
			69-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
152	AK	Asoke	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
153	BT	Bungbuong	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
154	BS	Bungbuae	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
155	BP	Bungbaer	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
156	PP	Bungpaesui	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
157	TD	Bungtalard	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
158	JB	Jorakabor	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
159	KB	Klongbangoi	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
160	LA	Klongka	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
161	GP	Klongpue	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
162	KR	Klongtepkreeta	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0

Appendix 6.3-3. Load and Installed Capacity of Distribution Substations (MEA Original Plan, Planning Year = 1997 - 2001)

(17/21)

No	ABB	Substation	Voltage (KV)	1998				1999						
				Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	
			69-24	x	0	0	0.00	0.0	0.0	x	0	0	0.00	0.0
			115-24	x	0	0.00	0.00	0.0	0.0	x	0	0	0.00	0.0
127	KE	Kasat	69-12	1 x (40)	40	16.77	21.75	54.4	0.0	x	0	0	0.00	0.0
			69-21	1 x 60	60	26.19	33.86	56.6	0.0	2 x	120	48.69	63.09	32.6
128	KC	Klongkum	115-24	1 x 60	60	33.12	42.95	71.6	0.0	2 x	120	41.14	57.58	48.0
129	KL	Klongrapu	115-24	1 x 60	60	16.48	21.37	35.6	0.0	1 x	60	19.11	21.80	41.3
130	KU	Kittiwong	69-12	1 x 40	40	12.36	16.03	40.1	0.0	1 x	40	12.85	16.55	41.6
			69-21	x	0	0	0.00	0.0	0.0	x	0	0	0.00	0.0
131	M1	Nuangthong 4	115-24	2 x 60	120	60.00	77.80	64.8	0.0	2 x	120	59.10	76.97	64.1
132	M5	Nuangthong 5	115-24	x	0	0	0.00	0.0	0.0	2 x	120	57.00	73.86	61.6
133	M6	Nuangthong 6	115-24	x	0	0	0.00	0.0	0.0	x	0	0	0.00	0.0
134	M7	Nuangthong 7	115-24	x	0	0	0.00	0.0	0.0	x	0	0	0.00	0.0
135	NL	Nuangtong	69-12	x	0	0	0.00	0.0	0.0	x	0	0	0.00	0.0
136	TA	Patanakorn	115-24	1 x 60	60	12.26	15.90	26.5	0.0	1 x	60	14.36	18.61	31.0
137	PL	Prabpla	115-24	x	0	0	0.00	0.0	0.0	x	0	0	0.00	0.0
138	PT	Praves	115-24	x	0	0	0.00	0.0	0.0	x	0	0	0.00	0.0
139	RP	Prawong	115-24	x	0	0	0.00	0.0	0.0	x	0	0	0.00	0.0
140	SI	Sinnoi	115-24	x	0	0	0.00	0.0	0.0	x	0	0	0.00	0.0
141	YN	Suvarn	115-12	1 x (40)	40	25.00	32.42	81.1	0.0	2 x (40)	80	40.07	51.92	61.9
			115-24	x	0	0	0.00	0.0	0.0	x	0	0	0.00	0.0
142	SIL	Satorn	115-24	x	0	0	0.00	0.0	0.0	x	0	0	0.00	0.0
143	HP	Shimjee	115-24	1 x 60	60	22.00	28.53	47.6	0.0	1 x	60	22.88	29.65	59.1
144	SW	Sriwong	69-12	2 x (40)	80	20.00	25.99	32.1	0.0	2 x (40)	80	23.00	29.80	37.3
			69-21	x	0	0	0.00	0.0	0.0	x	0	0	0.00	0.0
145	V1	Suwayai	115-24	x	0	0	0.00	0.0	0.0	x	0	0	0.00	0.0
146	WV	Suwinatong	115-24	2 x 60	120	10.00	12.97	10.8	0.0	2 x	120	12.00	15.55	13.0
147	T1	Tha-Khian	69-12	2 x (40)	80	20.72	26.87	33.6	0.0	2 x (40)	80	36.71	47.57	59.5
			69-21	x	0	0	0.00	0.0	0.0	x	0	0	0.00	0.0
148	TC	Trochan	115-12	1 x (40)	40	16.08	20.85	52.1	0.0	2 x (40)	80	32.72	42.10	53.0
			115-24	x	0	0	0.00	0.0	0.0	x	0	0	0.00	0.0
149	TY	Tubao	115-24	1 x 60	60	15.00	19.45	32.4	0.0	1 x	60	17.00	22.03	36.7
150	TK	Tatkapang	69-12	1 x 40	40	16.32	21.16	52.9	0.0	1 x 40	40	20.97	27.17	67.9
			69-21	x	0	0	0.00	0.0	0.0	x	0	0	0.00	0.0
151	WR	Wullakart	69-12	x	0	0	0.00	0.0	0.0	x	0	0	0.00	0.0
			69-21	x	0	0	0.00	0.0	0.0	x	0	0	0.00	0.0
152	AK	Asake	115-24	x	0	0	0.00	0.0	0.0	x	0	0	0.00	0.0
153	BT	Bangbonkong	115-24	x	0	0	0.00	0.0	0.0	x	0	0	0.00	0.0
154	BS	Banghuasac	115-24	x	0	0	0.00	0.0	0.0	x	0	0	0.00	0.0
155	BU	Bangbuac	115-24	x	0	0	0.00	0.0	0.0	x	0	0	0.00	0.0
156	PY	Bangpueyai	115-24	x	0	0	0.00	0.0	0.0	x	0	0	0.00	0.0
157	TD	Bangtalard	115-24	x	0	0	0.00	0.0	0.0	x	0	0	0.00	0.0
158	JB	Jorakibon	115-24	x	0	0	0.00	0.0	0.0	x	0	0	0.00	0.0
159	KB	Klongbangpi	115-24	x	0	0	0.00	0.0	0.0	x	0	0	0.00	0.0
160	LA	Klongra	115-24	x	0	0	0.00	0.0	0.0	x	0	0	0.00	0.0
161	GP	Klongpauc	115-24	x	0	0	0.00	0.0	0.0	x	0	0	0.00	0.0
162	RR	Krungtekreeta	115-24	x	0	0	0.00	0.0	0.0	x	0	0	0.00	0.0

Appendix 6.3-3 Load and Installed Capacity of Distribution Substations (MEA Original Plan, Planning Year = 1997 - 2001)

No	ABB	Substation	Voltage (KV)	2000				2001							
				Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)		
			69-24	x	0	0	0.00	0.0	0.00	0.0	2 x 60	120	23.16	29.96	25.0
			115-24	x	0	0	0.00	0.0	0.00	0.0	x	0	0	0.00	0.0
127	KE	Kaset	69-12	x	0	0	0.00	0.0	0.00	0.0	x	0	0	0.00	0.0
			69-24	x	0	0	0.00	0.0	0.00	0.0	x	0	0	0.00	0.0
128	KC	Klongkuan	69-24	2 x 60	120	50.14	64.99	54.2	64.99	54.2	2 x 60	120	51.63	66.82	55.7
129	KL	Klongkrapa	115-24	2 x 60	120	45.78	59.31	49.5	59.31	49.5	2 x 60	120	47.15	61.00	50.8
130	KU	Klongkrapa	115-24	1 x 60	60	19.71	25.55	42.6	25.55	42.6	2 x 60	120	32.30	41.79	34.8
			69-12	1 x 40	40	13.46	17.45	43.6	17.45	43.6	1 x 40	40	13.86	17.99	11.8
			69-24	x	0	0	0.00	0.0	0.00	0.0	x	0	0	0.00	0.0
131	MA	Muangthong 4	115-24	2 x 60	120	55.82	72.35	60.3	72.35	60.3	2 x 60	120	59.50	76.99	61.2
132	M5	Muangthong 5	115-24	2 x 60	120	61.35	79.52	66.3	79.52	66.3	2 x 60	120	59.19	76.58	63.8
133	M6	Muangthong 6	115-24	2 x 60	120	60.72	78.70	65.6	78.70	65.6	2 x 60	120	59.51	77.03	64.2
134	M7	Muangthong 7	115-24	x	0	0	0.00	0.0	0.00	0.0	2 x 60	120	71.36	92.32	76.9
135	ML	Manglerang	69-12	x	0	0	0.00	0.0	0.00	0.0	2 x 40	80	44.19	57.17	71.5
136	TA	Patanakam	115-24	1 x 60	60	18.25	23.66	39.4	23.66	39.4	2 x 60	120	34.80	45.02	37.5
137	PL	Phupha	115-24	x	0	0	0.00	0.0	0.00	0.0	2 x 60	120	34.51	44.69	37.2
138	PR	Prasac	115-24	2 x 60	120	32.63	42.29	35.3	42.29	35.3	2 x 60	120	43.61	56.12	47.0
139	PR	Prasong	115-24	2 x 60	120	34.71	44.99	37.5	44.99	37.5	2 x 60	120	35.75	46.25	38.5
140	SI	Saimai	115-24	x	0	0	0.00	0.0	0.00	0.0	2 x 60	120	22.36	28.93	24.1
141	YW	Sawarn	115-12	2 x (40)	80	41.57	53.88	67.4	53.88	67.4	2 x (40)	80	53.12	68.73	65.9
			115-24	x	0	0	0.00	0.0	0.00	0.0	x	0	0	0.00	0.0
142	SH	Satorn	115-24	x	0	0	0.00	0.0	0.00	0.0	2 x 60	120	30.36	38.28	32.7
143	RP	Shaplee	115-24	2 x 60	120	48.92	63.41	52.8	63.41	52.8	2 x 60	120	55.51	71.86	59.9
144	SV	Sriatong	69-12	2 x (40)	80	25.00	32.40	40.5	32.40	40.5	2 x (40)	80	34.88	45.13	56.1
			69-24	x	0	0	0.00	0.0	0.00	0.0	x	0	0	0.00	0.0
145	XI	Suanvat	115-24	x	0	0	0.00	0.0	0.00	0.0	2 x 60	120	21.36	27.64	23.0
146	TT	Suwinatong	115-24	2 x 60	120	14.00	18.15	15.1	18.15	15.1	2 x 60	120	16.36	21.17	11.6
147	T1	Tha-kuan	69-12	2 x (40)	80	37.81	49.01	61.3	49.01	61.3	2 x (40)	80	38.95	50.39	63.0
			69-24	x	0	0	0.00	0.0	0.00	0.0	x	0	0	0.00	0.0
148	TC	Trochan	115-12	2 x (40)	80	33.70	43.68	54.6	43.68	54.6	2 x (40)	80	34.72	44.92	56.2
			115-24	x	0	0	0.00	0.0	0.00	0.0	x	0	0	0.00	0.0
149	TY	Tubao	115-24	1 x 60	60	20.00	25.92	43.2	25.92	43.2	2 x 60	120	30.36	39.28	32.7
150	TK	Watkaemak	69-12	1 x 40	40	21.60	28.00	70.0	28.00	70.0	x	0	0	0.00	0.0
			69-24	x	0	0	0.00	0.0	0.00	0.0	2 x 60	120	31.25	41.31	36.9
151	TR	Trutakart	69-12	1 x (40)	40	17.00	22.04	55.1	22.04	55.1	x	0	0	0.00	0.0
			69-24	1 x 60	60	15.35	19.90	33.2	19.90	33.2	2 x 60	120	33.32	43.11	35.9
152	AK	Asake	115-24	x	0	0	0.00	0.0	0.00	0.0	x	0	0	0.00	0.0
153	BT	Bangbunrong	115-24	x	0	0	0.00	0.0	0.00	0.0	x	0	0	0.00	0.0
154	BS	Bangbaeac	115-24	x	0	0	0.00	0.0	0.00	0.0	x	0	0	0.00	0.0
155	BT	Bangbaeac	115-24	x	0	0	0.00	0.0	0.00	0.0	x	0	0	0.00	0.0
156	PV	Bangpleeai	115-24	x	0	0	0.00	0.0	0.00	0.0	x	0	0	0.00	0.0
157	PD	Banglalard	115-24	x	0	0	0.00	0.0	0.00	0.0	x	0	0	0.00	0.0
158	JH	Jorakubao	115-24	x	0	0	0.00	0.0	0.00	0.0	x	0	0	0.00	0.0
159	KU	Klongkrapa	115-24	x	0	0	0.00	0.0	0.00	0.0	x	0	0	0.00	0.0
160	LA	Klongkuan	115-24	x	0	0	0.00	0.0	0.00	0.0	x	0	0	0.00	0.0
161	GP	Klongkrapa	115-24	x	0	0	0.00	0.0	0.00	0.0	x	0	0	0.00	0.0
162	NR	Krungkroela	115-24	x	0	0	0.00	0.0	0.00	0.0	x	0	0	0.00	0.0

Appendix 6.3-3 Load and Installed Capacity of Distribution Substations (MEA Original Plan, Planning Year = 1997 - 2001)

No	ABB	Substation	Voltage (KV)	1996				1997					
				Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)
162	LB	Land & house	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
164	NB	Nuangthong 8	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
165	NB	Nuangthong 9	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
166	RL	Prarankao	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
167	RJ	Rajchatriroop	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
168	NP	Suanpao	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
169	ON	Suanhikom	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
170	OS	Songsunikom	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
171	IR	Srinakarin	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
172	LO	Thonglor	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
173	TU	Tungkru	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
174	TD	Watdechoo	69-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
175	GY	Bangkruey	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
176	GG	Buangrang	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
177	AA	Bungpla	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
178	LD	Klongbin	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
179	GT	Klonggratian	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
180	LG	Buangrang	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
181	LS	Lamkasue	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
182	NI	Niatlao	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
183	NY	Neangvai	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
184	TL	Prakiao	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
185	PI	Pongpetch	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
186	PT	Pattanaon	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
187	RO	Rajchakru	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
188	RR	Rajdamri	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
189	AT	Satornitai	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
190	TL	Talingchan	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
191	TH	Tuanasmit	115-24	X	0	0	0.00	0.0	X	0	0	0.00	0.0
192	RI	Trimit	69-12	X	0	0	0.00	0.0	X	0	0	0.00	0.0
Total					11.645	5.267.77	6.856.23	58.9		13.065	5.745.71	7.456.16	57.1

Diversity Factor
Power Factor

1.1805
0.9070

1.1809
0.9100

Number of Bank a
Number of Substation b
Ratio a/b

257
121
2.0726

282
131
2.1015

Appendix 6.3-3 Load and Installed Capacity of Distribution Substations (MEA Original Plan, Planning Year = 1997 - 2001)

No	ABB	Substation	Voltage (KV)	1998			1999						
				Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)
163	LJ	Land & house	15-21	X	0	0	0.00	0.0	X	0	0	0.00	0.0
164	X8	Wuangthong 8	15-21	X	0	0	0.00	0.0	X	0	0	0.00	0.0
165	X9	Wuangthong 9	15-21	X	0	0	0.00	0.0	X	0	0	0.00	0.0
166	RL	Prurunkao	15-21	X	0	0	0.00	0.0	X	0	0	0.00	0.0
167	RJ	Rajchapraroop	15-21	X	0	0	0.00	0.0	X	0	0	0.00	0.0
168	NP	Sanampao	15-21	X	0	0	0.00	0.0	X	0	0	0.00	0.0
169	OA	Saranitnom	15-21	X	0	0	0.00	0.0	X	0	0	0.00	0.0
170	OS	Soosunikon	15-21	X	0	0	0.00	0.0	X	0	0	0.00	0.0
171	TR	Srinakarin	15-21	X	0	0	0.00	0.0	X	0	0	0.00	0.0
172	UD	Thonglor	15-21	X	0	0	0.00	0.0	X	0	0	0.00	0.0
173	TU	Tungkru	15-21	X	0	0	0.00	0.0	X	0	0	0.00	0.0
174	VD	Katdeebod	69-21	X	0	0	0.00	0.0	X	0	0	0.00	0.0
175	CV	Bangkruiy	15-21	X	0	0	0.00	0.0	X	0	0	0.00	0.0
176	GC	Banggang	15-21	X	0	0	0.00	0.0	X	0	0	0.00	0.0
177	AA	Bangpla	15-21	X	0	0	0.00	0.0	X	0	0	0.00	0.0
178	LD	Klongdan	15-21	X	0	0	0.00	0.0	X	0	0	0.00	0.0
179	ET	Klonggratiam	15-21	X	0	0	0.00	0.0	X	0	0	0.00	0.0
180	LG	Luangpaeng	15-21	X	0	0	0.00	0.0	X	0	0	0.00	0.0
181	LS	Lumpasue	15-21	X	0	0	0.00	0.0	X	0	0	0.00	0.0
182	NI	Naitwai	15-21	X	0	0	0.00	0.0	X	0	0	0.00	0.0
183	XV	Nongvai	15-21	X	0	0	0.00	0.0	X	0	0	0.00	0.0
184	IL	Pinkhao	15-21	X	0	0	0.00	0.0	X	0	0	0.00	0.0
185	PL	Pongsetch	15-21	X	0	0	0.00	0.0	X	0	0	0.00	0.0
186	PT	Puhtamonton	15-21	X	0	0	0.00	0.0	X	0	0	0.00	0.0
187	RD	Rajchakru	15-21	X	0	0	0.00	0.0	X	0	0	0.00	0.0
188	RR	Rajdamri	15-21	X	0	0	0.00	0.0	X	0	0	0.00	0.0
189	AT	Satorntai	15-21	X	0	0	0.00	0.0	X	0	0	0.00	0.0
190	TL	Talingshan	15-21	X	0	0	0.00	0.0	X	0	0	0.00	0.0
191	TM	Tiamuomit	15-21	X	0	0	0.00	0.0	X	0	0	0.00	0.0
192	RM	Trimit	69-12	X	0	0	0.00	0.0	X	0	0	0.00	0.0
Total					13,905	5,171.44	8,002.55	57.6		11,565	6,626.57	8,586.20	59.0

Diversity Factor
Power Factor

1.1813
0.9110

1.1817
0.9120

Number of Bank a
Number of Substation b
Ratio a/b

255
139
2.1223

301
110
2.1711

Appendix 6.3-3 Load and Installed Capacity of Distribution Substations (MEA Original Plan, Planning Year = 1997 - 2001)

(21/21)

No	ABB	Substation	Voltage (KV)	2000				2001					
				Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)
163	LH	Land & House	115-24	X	0	0	0.00	0.0	X	0	0.00	0.0	
164	M8	Muangthong 8	115-24	X	0	0	0.00	0.0	X	0	0.00	0.0	
165	M9	Muangthong 9	115-24	X	0	0	0.00	0.0	X	0	0.00	0.0	
166	RL	Prirakan	115-24	X	0	0	0.00	0.0	X	0	0.00	0.0	
167	RJ	Rajchuratrop	115-24	X	0	0	0.00	0.0	X	0	0.00	0.0	
168	NP	Sunampao	115-24	X	0	0	0.00	0.0	X	0	0.00	0.0	
169	OM	Sananikorn	115-24	X	0	0	0.00	0.0	X	0	0.00	0.0	
170	OS	Songsunikon	115-24	X	0	0	0.00	0.0	X	0	0.00	0.0	
171	IK	Srinakarin	115-24	X	0	0	0.00	0.0	X	0	0.00	0.0	
172	LO	Thonglor	115-24	X	0	0	0.00	0.0	X	0	0.00	0.0	
173	TU	Tungkru	115-24	X	0	0	0.00	0.0	X	0	0.00	0.0	
174	FD	Watdeod	69-24	X	0	0	0.00	0.0	X	0	0.00	0.0	
175	CV	Bangkruey	115-24	X	0	0	0.00	0.0	X	0	0.00	0.0	
176	CC	Bangpaeng	115-24	X	0	0	0.00	0.0	X	0	0.00	0.0	
177	AA	Bangpa	115-24	X	0	0	0.00	0.0	X	0	0.00	0.0	
178	LD	Klongdan	115-24	X	0	0	0.00	0.0	X	0	0.00	0.0	
179	CT	Klongratiam	115-24	X	0	0	0.00	0.0	X	0	0.00	0.0	
180	LC	Luangpang	115-24	X	0	0	0.00	0.0	X	0	0.00	0.0	
181	LS	Lumpashe	115-24	X	0	0	0.00	0.0	X	0	0.00	0.0	
182	NI	Nimitmai	115-24	X	0	0	0.00	0.0	X	0	0.00	0.0	
183	NY	Nongyai	115-24	X	0	0	0.00	0.0	X	0	0.00	0.0	
184	IL	Pinklao	115-24	X	0	0	0.00	0.0	X	0	0.00	0.0	
185	PI	Pongpetch	115-24	X	0	0	0.00	0.0	X	0	0.00	0.0	
186	PT	Puttamonon	115-24	X	0	0	0.00	0.0	X	0	0.00	0.0	
187	NO	Rajchakru	115-24	X	0	0	0.00	0.0	X	0	0.00	0.0	
188	RR	Rajdamri	115-24	X	0	0	0.00	0.0	X	0	0.00	0.0	
189	AT	Satornrai	115-24	X	0	0	0.00	0.0	X	0	0.00	0.0	
190	TL	Talingchan	115-24	X	0	0	0.00	0.0	X	0	0.00	0.0	
191	TM	Tiamruamit	115-24	X	0	0	0.00	0.0	X	0	0.00	0.0	
192	RM	Triwil	69-12	X	0	0	0.00	0.0	X	0	0.00	0.0	
Total					15.465	7.131.06	9.243.01	59.8		17.625	7.661.89	9.916.53	56.3

Diversity Factor
Power Factor

1.1821
0.9120

Number of Bank a
Number of Substation b
Ratio a/b

319
151
2.2715

APPENDIX

for

CHAPTER 6

(6.3-4)

Appendix 6.3-4 Load and Installed Capacity of Distribution Substations (JICA Study Team Plan, Planning Year = 1997 - 2001)

No	Substation	Voltage (KV)	1996				1997						
			Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)			
1	Bangbon	69-12	120	59.67	77.66	64.7	3	3	40	0	55.90	72.35	60.5
		69-21	0	0	0.00	0.0				0	0.00	0.00	0.0
2	Bangchalong	115-24	80	32.04	41.70	69.5	2	2	60	120	64.63	83.87	68.9
		69-12	80	38.41	48.99	62.5	2	2	40	80	28.47	36.95	46.2
		69-24	60	21.93	28.51	47.6	1	1	60	60	22.00	28.55	47.5
3	Bangkapi	115-24	60	22.38	29.13	48.6	1	1	60	60	27.15	35.23	58.7
		69-12	120	64.58	84.05	70.1	3	3	40	120	61.47	79.77	66.5
		69-24	80	38.55	50.18	62.7	1	1	40	40	23.76	30.83	77.1
4	Bangkhon	115-24	80	38.55	50.18	62.7	1	1	10	40	19.11	21.80	62.0
		69-12	40	18.05	23.49	58.7	1	1	40	40	18.52	21.03	60.1
		69-24	40	19.08	24.83	62.1	1	1	60	60	18.00	23.36	58.9
5	Bangkrachao	115-24	20	6.34	8.25	41.3	2	2	10	20	6.88	8.93	41.6
		69-12	80	39.40	51.28	64.1	2	2	(40)	80	40.05	51.97	65.0
		69-24	0	0.00	0.00	0.0				0	0.00	0.00	0.0
6	Bangkok	115-24	40	14.02	18.25	45.6	1	1	40	40	10.70	14.82	66.0
		69-12	40	21.94	27.38	68.5	2	2	40	80	40.70	52.82	66.0
		69-24	60	71.34	92.98	66.4	1	1	20	140	82.87	107.51	76.8
7	Bangnae juet	115-24	120	69.22	90.05	75.1	2	2	60	120	61.11	83.20	69.3
		69-12	120	57.74	75.15	62.6	3	3	(40)	120	66.45	86.23	71.9
		69-24	0	0.00	0.00	0.0				0	0.00	0.00	0.0
8	Bangplee	115-24	120	59.54	77.49	64.6	2	2	60	120	51.63	67.00	55.8
		69-12	40	22.00	28.63	71.6	1	1	40	40	20.19	26.20	65.3
		69-24	60	20.52	26.71	44.5	1	1	60	60	28.00	36.31	60.6
		115-24	0	0.00	0.00	0.0				0	0.00	0.00	0.0
9	Bangpu	115-24	120	52.76	68.67	57.2	2	2	60	120	48.14	63.77	53.1
		69-12	80	51.05	66.44	83.1	2	2	40	80	43.27	56.16	70.2
		69-24	120	39.35	51.22	42.7	2	2	60	120	42.23	54.80	45.7
10	Bangrakrai	115-24	60	28.69	37.31	62.2	1	1	60	60	32.30	41.92	69.9
		69-12	80	37.59	48.93	61.2	1	1	40	40	22.13	28.72	71.8
		69-24	0	0.00	0.00	0.0	1	1	40	40	22.00	28.55	71.1
11	Bangsoi loong	115-24	60	29.30	38.14	63.6	1	1	60	60	35.29	45.80	76.3
		69-12	80	38.20	49.72	62.2	2	2	40	80	29.81	38.68	48.1
		69-24	60	15.99	20.81	34.7	1	1	60	60	31.85	41.33	68.9
12	Bangyeechan	230-12	100	50.33	65.51	65.5	2	2	50	100	47.54	61.69	61.7
		69-12	0	0.00	0.00	0.0				0	0.00	0.00	0.0
		69-24	0	0.00	0.00	0.0				0	0.00	0.00	0.0
13	Chalongkrung	69-12	0	0.00	0.00	0.0				0	0.00	0.00	0.0
		69-24	140	44.80	58.31	41.7	2	2	40	140	45.13	58.57	41.8
14	Chanasee	115-24	120	46.71	60.80	50.7	2	2	50	120	18.73	23.7	52.7
		69-12	120	50.61	65.87	54.9	3	3	(40)	120	63.33	82.41	68.7
		69-24	0	0.00	0.00	0.0				0	0.00	0.00	0.0
15	Chidlow	69-12	0	0.00	0.00	0.0				0	0.00	0.00	0.0
		69-24	160	69.29	90.18	56.1	1	1	30	160	63.82	82.82	51.8
16	Damaung	69-12	0	0.00	0.00	0.0				0	0.00	0.00	0.0
		69-24	60	41.80	58.31	41.7	2	2	40	60	45.13	58.57	41.8
17	Ilavayuang	115-24	120	46.71	60.80	50.7	2	2	50	120	18.73	23.7	52.7
		69-12	120	50.61	65.87	54.9	3	3	(40)	120	63.33	82.41	68.7
		69-24	0	0.00	0.00	0.0				0	0.00	0.00	0.0
18	Klongjan	69-12	0	0.00	0.00	0.0				0	0.00	0.00	0.0
		69-24	60	41.80	58.31	41.7	2	2	40	60	45.13	58.57	41.8
19	Klongkai	69-12	0	0.00	0.00	0.0				0	0.00	0.00	0.0
		69-24	40	16.69	21.72	51.3	1	1	40	40	18.93	21.57	51.1
20	Klongsuanchai	69-12	40	27.74	36.11	90.3	1	1	40	80	43.28	56.16	70.2

No	ABB	Substation	Voltage (KV)	1998				1999				
				Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)
1	BB	Bangbon	69-12	3 x 40	120	51.54	66.83	55.7	80	31.15	40.36	50.5
			69-21	x	0	0.00	0.00	0.0	x	23.96	31.01	77.6
			115-24	x	120	67.21	87.15	72.6	x	61.90	80.21	66.8
2	BN	Bangchalong	69-12	2 x 40	80	29.00	37.81	47.0	2 x 40	31.66	41.92	56.2
			69-24	1 x 60	60	23.49	30.46	50.8	1 x 60	31.10	31.10	51.8
			115-21	1 x 60	60	28.21	36.82	51.0	2 x 60	33.05	42.82	35.7
3	BR	Bangkhampra	69-12	3 x 40	120	82.70	81.30	67.8	3 x 40	71.23	92.29	76.9
			69-12	1 x 40	40	17.00	22.41	55.1	1 x 40	17.00	22.03	55.1
			69-24	1 x 40	40	20.29	26.31	65.8	1 x 40	21.78	28.22	70.6
4	BO	Bangkok noi	69-12	1 x 40	40	19.94	25.86	64.6	1 x 40	20.17	28.11	65.3
			69-21	1 x 60	60	22.09	28.53	47.6	1 x 60	23.66	30.56	51.1
			69-12	2 x 10	20	7.16	9.28	16.1	2 x 10	7.15	9.55	18.3
			69-21	x	0	0.00	0.00	0.0	x	0	0.00	0.0
5	BN	Bangwood	69-12	2 x (40)	80	38.31	49.68	62.1	2 x (40)	25.85	33.49	41.9
			69-21	x	0	0.00	0.00	0.0	1 x 60	20.00	25.91	13.2
6	BO	Bongna	69-12	x	0	0.00	0.00	0.0	x	0	0.00	0.0
			69-21	2 x 40	80	43.65	56.60	70.8	2 x 40	45.16	58.52	73.2
7	BU	Buangmued	115-21	1 x 20	20	83.34	108.07	77.2	1 x 20	83.16	110.31	78.8
8	BU	Buangping	69-12	2 x 60	120	68.26	88.51	73.8	2 x 60	68.92	88.53	73.8
			69-21	3 x (40)	120	62.82	81.46	67.9	3 x (40)	61.57	79.78	66.5
			69-21	x	0	0.00	0.00	0.0	x	0	0.00	0.0
9	BP	Bangpice	69-24	2 x 60	120	53.70	69.63	58.0	2 x 60	53.85	72.37	60.3
			115-21	x	0	0.00	0.00	0.0	x	0	0.00	0.0
10	PG	Bangpongung	69-12	1 x 40	40	19.12	24.79	62.0	x	0	0.00	0.0
			69-24	1 x 60	60	30.00	38.90	64.8	x	0	0.00	0.0
			115-24	x	0	0.00	0.00	0.0	2 x 60	51.12	66.21	55.2
11	BD	Bangbood	69-24	x	0	0.00	0.00	0.0	x	0	0.00	0.0
			115-24	2 x 60	120	51.11	66.23	55.2	2 x 60	53.15	68.87	57.1
12	BU	Bungou	115-24	2 x 40	80	45.04	58.40	73.0	2 x 40	45.03	58.35	72.9
13	BU	Bungakvai	115-24	2 x 60	120	44.08	57.16	47.6	2 x 60	48.81	63.28	52.1
14	BS	Bangsonlong	115-21	1 x 60	60	33.59	43.55	72.6	1 x 60	31.51	45.27	75.5
15	BY	Bangyechan	69-12	1 x 40	40	21.70	28.14	70.1	1 x 40	21.30	27.60	69.0
			69-21	1 x 40	40	24.06	31.12	77.8	1 x 40	24.18	31.33	78.3
16	CG	Chalongkrung	115-21	1 x 60	60	30.70	39.81	65.4	1 x 60	31.93	41.37	69.0
17	CK	Chanlusea	69-12	2 x 40	80	31.67	41.07	51.3	1 x 40	16.59	21.50	53.7
			69-21	1 x 60	60	33.13	42.96	71.6	1 x 60	18.80	23.23	63.2
18	CL	Chidit	230-12	2 x 50	100	49.45	64.12	64.1	2 x 50	50.96	66.03	65.0
			69-24	x	0	0.00	0.00	0.0	x	0	0.00	0.0
19	DM	Danuang	69-12	x	0	0.00	0.00	0.0	x	0	0.00	0.0
			69-24	x	0	0.00	0.00	0.0	x	0	0.00	0.0
			115-24	2 x 60	120	46.91	60.87	50.7	2 x 60	48.81	63.21	52.7
20	HK	Huaykwang	69-24	2 x 60	120	51.67	67.00	55.8	2 x 60	53.91	69.89	58.2
21	KP	Kongpetch	69-12	3 x (40)	120	69.14	89.66	74.7	3 x (40)	65.16	84.43	70.1
			69-24	x	0	0.00	0.00	0.0	x	0	0.00	0.0
22	KJ	Klongjan	69-12	1 x 40	40	16.82	21.82	48.0	1 x 40	16.82	21.82	48.0
			69-21	1 x 60	60	59.24	76.80	68.0	1 x 60	52.99	68.66	62.9
23	KN	Klongyai	69-12	x	0	0.00	0.00	0.0	x	0	0.00	0.0
			69-21	1 x 40	40	22.69	29.42	73.6	1 x 40	23.60	30.58	76.5
24	SC	Klongsuancheui	69-12	1 x 40	40	42.42	55.01	68.6	1 x 40	43.55	56.15	68.6

No	ABB	Substation	Voltage (KV)	2000				2001				
				Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)
1	BB	Bangbon	69-12 69-24	2 x 40 1 x 40	80 40	35.32 20.00	45.78 25.92	57.2 64.8	0 120	0 64.08	0 82.90	0 69.1
2	BN	Bangcha Long	115-24	2 x 60	120	53.76	82.61	68.9	120	65.67	81.96	70.8
3	BA	Bangkap	69-12 69-24	2 x 40 1 x 60	80 60	36.22 30.00	46.95 38.89	58.7 61.8	80 60	31.49 33.72	41.62 43.63	55.8 72.7
4	KA	Bangkhao	115-24	2 x 60	120	36.98	47.93	39.9	120	36.91	47.19	39.8
5	BR	Bangkhumprom	69-12	3 x 40	120	33.40	95.14	75.3	120	56.50	73.10	60.9
6	BL	Bangkok	69-12 69-24	1 x 40 1 x 40	40 40	17.50 22.45	22.68 29.10	56.7 72.8	0 80	0 41.15	0 53.21	0 66.6
7	BO	Bangkok noi	69-12	1 x 40	40	19.97	25.88	61.7	40	18.72	21.22	60.6
8	BC	Bangkrachao	69-12 69-24	1 x 60 2 x 10	60 20	25.00 8.67	32.40 11.24	51.0 56.2	60 20	27.60 8.93	35.71 11.55	59.5 57.8
9	BN	Bangkok	69-12 69-24	2 x (40) 1 x 60	80 60	41.22 28.00	53.43 36.29	68.8 60.5	80 60	39.33 31.77	51.11 41.10	62.9 68.5
10	BC	Bangwa	69-12 69-24	2 x 40 2 x 40	80 80	0 40.27	0 52.20	0 65.3	0 80	0 41.27	0 53.39	0 66.7
11	BJ	Bangnam Jued	115-24	1 x 20	20	75.17	97.43	68.6	140	70.52	91.24	65.2
12	BL	Bangping	115-24	2 x 60	120	63.63	82.48	69.7	120	66.57	86.13	71.8
13	BK	Bangplakod	69-12 69-24	3 x (40) 2 x 60	120 120	63.51 0	82.32 0	68.6 0	120 120	68.51 0	88.61 0	73.9 0
14	BP	Bangplee	69-24 115-24	2 x 60 x x	120 0	62.65 0	81.21 0	67.7 0	120 0	59.25 0	76.66 0	63.9 0
15	PC	Bangpongang	69-12 69-24 115-24	x x x x 2 x 60	0 0 120	0 0 52.69	0 0 68.30	0 0 58.9	0 0 120	0 0 62.18	0 0 80.15	0 0 67.0
16	BD	Bangpood	69-24 115-24	x x 2 x 60	0 120	0 54.75	0 70.97	0 59.1	0 120	0 18.00	0 62.10	0 51.8
17	BU	Bangpu	115-24	2 x 40	80	44.48	57.65	72.1	80	15.82	59.23	74.1
18	BT	Bangrakvai	115-24	2 x 60	120	50.22	65.09	51.2	120	42.27	51.69	45.6
19	BS	Bangsuatong	115-24	1 x 60	60	31.94	41.39	69.0	60	32.89	42.53	70.9
20	BT	Bang'ceckhan	69-12 69-24	1 x 40 1 x 40	40 40	18.00 24.00	23.33 31.11	58.3 77.8	40 80	0 40.78	0 52.76	0 66.0
21	CS	Chalengkrun	115-24	1 x 60	60	32.89	42.62	71.0	60	33.87	43.82	73.0
22	CA	Chamsuew	69-12 69-24	1 x 40 1 x 40	40 40	17.09	22.15	55.1	40	17.60	22.17	56.9
23	CL	Chidlow	69-24 230-12 69-24	1 x 60 2 x 50 x x	60 100 0	49.33 52.48 0	63.94 68.03 0	63.9 68.0	100 100 0	18.68 51.06 0	62.98 69.91 0	63.0 69.9 0
24	DA	Donmuang	69-12 69-24 115-24	x x x x 2 x 60	0 0 120	0 0 50.28	0 0 55.17	0 0 51.3	0 0 120	0 0 51.79	0 0 67.00	0 0 55.8
25	KA	Khaykwang	69-24	2 x 60	120	55.71	72.21	60.2	180	74.53	96.12	53.6
26	KP	Kingpetch	69-12 69-24	3 x (40) x x	120 0	57.12 0	87.00 0	72.5 0	120	41.94	51.26	67.8
27	KJ	Klongjan	69-12 69-24	x x 1 x 40	0 60	0 54.58	0 70.75	0 44.2	0 160	0 56.22	0 72.71	0 15.5
28	KN	Klongmai	69-12 69-24	x x 2 x 60	0 120	0 34.30	0 44.16	0 37.1	0 120	0 13.33	0 55.06	0 16.7
29	SC	Etongsamanchai	69-12	1 x 40	40	16.02	20.77	51.9	40	16.19	21.33	53.3

Appendix 6.3-4 Load and Installed Capacity of Distribution Substations (JICA Study Team Plan, Planning Year = 1997 - 2001)

No	ABB	Substation	Voltage (KV)	1996				1997						
				Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	
			69-21	X	0	0	0.00	0.0	0.00	X	0	0.00	0.00	0.0
			115-21	X	0	0	0.00	0.0	0.00	X	0	0.00	0.00	0.0
30	KS	Klongsamsamit	69-12	2 X 20	1 X 40	39.95	52.00	65.0	39.95	2 X 20	1 X 40	41.95	58.33	72.9
			69-21	X	0	0	0.00	0.0	0.00	X	0	0.00	0.00	0.0
31	KN	Klongsarn	69-12	X	0	0	0.00	0.0	0.00	X	0	0.00	0.00	0.0
			69-21	2 X 40	X	43.23	56.27	70.3	43.23	2 X 40	X	43.61	56.59	70.7
32	KT	Klongtoey	69-12	2 X 40	X	39.29	51.14	63.9	39.29	2 X 40	X	31.19	40.48	50.6
			69-21	X	0	0	0.00	0.0	0.00	X	0	0.00	0.00	0.0
33	WC	Klongratsing	69-12	2 X (40)	X	29.39	38.25	47.8	29.39	2 X (40)	X	31.83	41.34	51.7
			69-21	X	0	0	0.00	0.0	0.00	X	0	0.00	0.00	0.0
34	KU	Kronai	69-12	1 X 40	1 X (40)	38.65	51.61	64.5	38.65	1 X 40	1 X (40)	32.07	41.61	52.0
			69-21	X	0	0	0.00	0.0	0.00	X	0	0.00	0.00	0.0
35	LX	Lardlakao	115-21	1 X 60	X	24.88	32.38	54.0	24.88	1 X 60	X	28.15	36.53	60.9
36	LP	Lardprao	69-12	2 X 20	X	26.93	35.05	43.7	26.93	2 X (40)	X	41.41	57.64	72.0
			69-21	X	0	0	0.00	0.0	0.00	X	0	0.00	0.00	0.0
37	LX	Lumpini	69-12	4 X 40	X	85.39	111.14	69.5	85.39	4 X 40	X	87.55	113.61	71.0
			69-21	X	0	0	0.00	0.0	0.00	X	0	0.00	0.00	0.0
38	MY	Muhaisuan	69-12	2 X 40	X	16.00	20.83	26.0	16.00	2 X 40	X	17.57	22.80	28.5
			69-21	1 X 60	X	20.14	26.21	33.7	20.14	1 X 60	X	23.75	30.82	38.1
39	MX	Mahauek	69-12	2 X 40	1 X (40)	54.16	70.49	58.7	54.16	2 X 40	1 X (40)	65.73	85.30	71.1
			115-21	X	0	0	0.00	0.0	0.00	X	0	0.00	0.00	0.0
40	MA	Mai-ae	69-12	2 X 40	X	39.64	51.59	64.5	39.64	2 X 40	X	43.11	55.94	69.9
			69-21	X	0	0	0.00	0.0	0.00	X	0	0.00	0.00	0.0
41	MS	Makasan	69-12	2 X 40	X	53.14	69.18	86.5	53.14	2 X 40	1 X (40)	67.22	87.23	72.7
			69-21	X	0	0	0.00	0.0	0.00	X	0	0.00	0.00	0.0
42	MB	Mimburi	115-21	2 X 60	X	52.90	68.85	57.4	52.90	2 X 60	X	56.76	65.87	51.9
43	MC	Mochit	69-12	2 X 40	1 X (40)	44.52	57.95	48.3	44.52	2 X 40	1 X (40)	49.99	64.87	54.1
			69-21	X	0	0	0.00	0.0	0.00	X	0	0.00	0.00	0.0
44	MC	Muangmai	115-21	2 X 60	X	59.63	77.61	64.7	59.63	2 X 60	X	55.31	71.78	59.8
45	MI	Muangthong 1	115-21	1 X 60	X	41.64	54.20	59.3	41.64	2 X 60	X	50.87	65.75	51.8
46	MI	Mu-nu	69-12	1 X (40)	X	14.79	19.25	48.1	14.79	1 X (40)	X	16.00	20.76	51.9
			69-21	2 X 60	X	17.18	22.36	18.6	17.18	2 X 60	X	23.35	30.30	25.3
			115-21	X	0	0	0.00	0.0	0.00	X	0	0.00	0.00	0.0
47	MI	Mongkham	69-12	1 X 40	X	22.00	28.63	71.6	22.00	1 X 40	X	21.05	31.21	78.0
			69-21	1 X 60	X	24.24	31.55	52.6	24.24	1 X 60	X	25.00	32.11	51.1
48	NK	Nonthaburi	69-12	2 X 20	1 X 40	48.81	63.53	79.1	48.81	2 X 20	1 X 40	44.71	58.02	72.5
			115-12	X	0	0	0.00	0.0	0.00	X	0	0.00	0.00	0.0
			115-21	X	0	0	0.00	0.0	0.00	X	0	0.00	0.00	0.0
49	NK	North Bangkok	69-12	2 X 20	X	13.70	17.83	44.6	13.70	2 X 20	X	14.6	19.6	49.0
			69-21	3 X 40	X	17.11	22.27	18.6	17.11	3 X 40	X	32.34	42.75	35.6
50	PE	Phakred	69-12	2 X 40	X	38.36	49.93	62.4	38.36	2 X 40	X	40.00	50.00	60.0
			69-21	1 X 60	X	35.60	46.34	77.2	35.60	1 X 60	X	37.2	47.2	60.0
			115-12	X	0	0	0.00	0.0	0.00	1 X 40	X	23.00	29.85	74.6
			115-21	X	0	0	0.00	0.0	0.00	2 X 60	X	40.14	52.09	43.1
51	PK	Paknam	115-21	2 X 40	X	48.81	63.53	79.1	48.81	2 X 40	X	42.36	55.75	69.7
52	PS	Petchaburi	69-12	1 X 40	2 X 22.4	44.76	58.26	68.7	44.76	1 X 40	2 X 22.4	50.63	65.70	77.5
			69-21	X	0	0	0.00	0.0	0.00	X	0	0.00	0.00	0.0
53	PI	Phaisiingto	69-12	1 X 40	X	20.86	27.15	67.9	20.86	1 X 40	X	18.43	23.92	59.8
			69-21	2 X 60	X	48.00	62.47	52.1	48.00	2 X 60	X	59.79	77.59	61.7

Appendix 6.3-4. Load and Installed Capacity of Distribution Substations (JICA Study Team Plan, Planning Year = 1997 - 2001)

No	ABB	Substation	Voltage (KV)	1998				1999						
				Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	
			69-24	x	0	0.00	0.00	0.00	0.00	1 x 60	60	26.22	33.97	56.6
			115-24	x	0	0.00	0.00	0.00	0.00	x	0	0.00	0.00	0.0
30	KS	Klongsamsaen	69-12	2 x 20	40	47.72	61.88	77.4	80	2 x 20	40	44.91	58.19	72.7
			69-24	x	0	0.00	0.00	0.00	0.00	x	0	0.00	0.00	0.0
31	KN	Klongsarn	69-12	x	0	0.00	0.00	0.00	0.00	x	0	0.00	0.00	0.0
			69-24	2 x 40	80	45.36	58.82	73.5	80	2 x 40	80	41.93	51.33	67.9
32	NT	Klongtoey	69-12	1 x 40	40	14.44	18.72	46.8	40	1 x 40	40	15.00	19.11	48.6
			69-24	1 x 40	40	20.00	25.93	64.8	40	1 x 40	40	20.82	26.98	67.1
33	NC	Klongsatsing	69-12	2 x (40)	80	34.20	44.35	55.4	80	2 x (40)	80	41.06	53.20	66.5
			69-24	x	0	0.00	0.00	0.00	0.00	x	0	0.00	0.00	0.0
34	XU	Kruai	69-12	1 x 40	40	33.20	43.05	53.8	40	1 x 40	40	31.53	41.71	53.9
			69-24	x	0	0.00	0.00	0.00	0.00	x	0	0.00	0.00	0.0
35	LS	Lardlakao	115-24	1 x 60	60	25.03	32.52	54.2	60	1 x 60	60	35.01	45.40	75.7
36	LP	Lardprao	69-12	2 x (40)	80	33.56	43.52	54.4	40	1 x (40)	40	14.90	19.31	48.3
			69-24	x	0	0.00	0.00	0.00	0.00	1 x 60	60	20.00	25.91	43.2
37	LN	Lumpini	69-12	4 x 40	160	91.04	118.05	73.8	160	4 x 40	160	91.68	122.68	76.7
			69-24	x	0	0.00	0.00	0.00	0.00	x	0	0.00	0.00	0.0
38	MN	Mahaissawan	69-12	2 x 40	80	18.07	23.43	29.3	80	2 x 40	80	18.60	21.10	30.1
			69-24	1 x 60	60	24.70	32.03	52.4	60	1 x 60	60	25.69	33.29	55.5
39	MV	Mahaack	69-12	2 x 40	80	69.88	90.62	75.5	120	2 x 40	80	72.68	91.18	78.5
			115-24	x	0	0.00	0.00	0.00	0.00	x	0	0.00	0.00	0.0
40	MA	Mai-ud	69-12	2 x 40	80	38.71	50.20	62.8	80	2 x 40	80	40.26	52.17	65.2
			69-24	x	0	0.00	0.00	0.00	0.00	x	0	0.00	0.00	0.0
41	MS	Makasan	69-12	2 x 40	80	69.91	90.65	75.5	120	2 x 40	80	72.71	91.21	78.5
			69-24	2 x 60	120	45.97	59.61	49.7	120	2 x 60	120	47.83	61.97	51.6
42	MB	Mimburi	115-24	2 x 60	120	45.41	58.88	49.1	120	2 x 40	80	47.52	61.57	51.3
			69-24	x	0	0.00	0.00	0.00	0.00	x	0	0.00	0.00	0.0
43	MC	Mochit	115-24	2 x 60	120	51.69	67.03	55.9	120	2 x 60	120	53.76	69.66	58.1
			69-24	2 x 60	120	56.86	73.73	61.4	120	2 x 60	120	57.13	74.03	61.7
44	MG	Muangmai	69-12	1 x (40)	40	16.35	21.20	53.0	40	1 x (40)	40	16.56	21.16	53.6
			69-24	2 x 60	120	24.57	31.86	26.6	120	2 x 60	120	26.00	33.69	28.1
45	XI	Muangthong	115-24	3 x 40	120	34.26	44.43	37.0	120	3 x 40	120	38.17	49.85	41.5
			69-24	x	0	0.00	0.00	0.00	0.00	x	0	0.00	0.00	0.0
46	NR	Na-na	69-12	1 x 40	40	0.00	0.00	0.00	0.00	1 x 40	40	22.44	29.08	72.7
			69-24	1 x 60	60	20.36	26.40	41.0	60	1 x 60	60	23.17	31.80	63.0
47	NH	Nongkham	69-12	2 x 40	80	45.98	59.62	74.5	80	2 x 40	80	43.00	55.71	69.6
			69-24	3 x 40	120	34.26	44.43	37.0	120	3 x 40	120	38.17	49.85	41.5
48	NR	NanDaburi	69-12	1 x 40	40	0.00	0.00	0.00	0.00	1 x 40	40	22.44	29.08	72.7
			115-12	1 x 60	60	20.36	26.40	41.0	60	1 x 60	60	23.17	31.80	63.0
49	NV	North Bangkok	69-12	2 x 40	80	45.98	59.62	74.5	80	2 x 40	80	43.00	55.71	69.6
			69-24	3 x 40	120	34.26	44.43	37.0	120	3 x 40	120	38.17	49.85	41.5
50	PE	Pakred	69-12	1 x 40	40	0.00	0.00	0.00	0.00	1 x 40	40	22.44	29.08	72.7
			69-24	1 x 60	60	20.36	26.40	41.0	60	1 x 60	60	23.17	31.80	63.0
51	PN	Panna	115-24	2 x 60	120	41.66	57.51	48.3	120	2 x 60	120	47.00	60.90	50.8
			69-24	2 x 40	80	45.98	59.62	74.5	80	2 x 40	80	43.00	55.71	69.6
52	PS	Petchkasae	69-12	1 x 40	40	51.66	66.99	79.0	84.8	1 x 40	40	51.03	66.13	78.0
			69-24	1 x 60	60	20.36	26.40	41.0	60	1 x 60	60	23.17	31.80	63.0
53	PI	Phaisangto	69-12	1 x 40	40	19.17	24.86	62.2	40	1 x 40	40	19.91	25.81	61.6
			69-24	2 x 60	120	52.18	67.66	56.1	120	2 x 60	120	54.67	70.81	59.0

No	ABB	Substation	Voltage (KV)	2000				2001					
				Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)
			69-24	1 x 60	60	27.00	35.00	58.3	1 x 60	60	27.82	35.99	60.0
			89-12	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
30	ES	Klongsamsamit	69-12	2 x 20	40	46.26	59.96	75.0	2 x 20	40	47.65	61.65	77.1
			89-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
31	EN	Klongsarn	69-12	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
			89-24	2 x 40	80	42.59	55.20	69.0	2 x 40	80	43.86	56.71	70.9
32	KT	Klongtoey	69-12	1 x 40	40	14.89	19.30	48.3	x	0	0.00	0.00	0.0
			89-24	1 x 40	40	22.00	28.52	71.3	2 x 40	80	38.00	49.15	61.5
33	KG	Klongsatsing	69-12	2 x (40)	80	45.70	59.23	74.0	x	0	0.00	0.00	0.0
			89-24	1 x 40	40	35.57	46.10	57.5	1 x 40	40	36.63	47.39	59.2
34	KU	Krunai	69-12	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
			89-24	1 x 60	60	35.85	45.47	77.5	1 x 60	60	21.69	31.91	53.2
35	LK	Lardpakao	69-12	1 x (40)	40	15.45	20.03	50.1	2 x (40)	80	30.67	39.68	49.6
			89-24	1 x 60	60	20.50	26.57	41.3	1 x 60	60	18.36	23.75	39.6
37	LY	Lumpini	69-12	4 x 40	160	97.52	126.40	79.0	1 x 40	40	22.38	28.95	72.4
			89-24	x	0	0.00	0.00	0.0	2 x 40	80	71.70	92.76	66.3
38	MY	Mahaissawan	69-12	1 x 40	40	14.47	18.76	46.9	x	0	0.00	0.00	0.0
			89-24	1 x 60	60	36.82	47.73	77.5	2 x 40	80	62.01	80.27	57.3
39	NV	Nahamek	69-12	2 x 40	80	71.70	92.94	47.7	x	0	0.00	0.00	0.0
			89-24	x	0	0.00	0.00	0.0	3 x 60	180	73.85	95.51	53.1
40	NA	Nai-ad	69-12	2 x 40	80	41.47	53.75	67.2	x	0	0.00	0.00	0.0
			89-24	x	0	0.00	0.00	0.0	2 x 40	80	42.71	55.26	69.1
41	NS	Nakasan	69-12	2 x 40	80	64.09	83.07	69.2	2 x 40	80	41.99	51.93	67.9
			89-24	x	0	0.00	0.00	0.0	1 x 60	60	28.85	37.33	62.2
42	NB	Ninburi	69-12	2 x 60	120	40.08	51.95	43.3	2 x 60	120	52.13	67.44	56.2
			89-24	2 x 40	80	50.50	65.46	54.6	2 x 40	80	65.63	81.91	70.8
43	NC	Nochit	69-12	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
			89-24	2 x 60	120	55.37	71.77	59.8	2 x 60	120	57.01	73.80	61.5
44	ND	Nuangsein	69-12	2 x 60	120	60.85	78.87	65.7	2 x 60	120	67.66	87.53	72.9
			89-12	1 x (40)	40	17.00	22.04	55.1	1 x (40)	40	16.99	21.98	55.0
46	NV	Nu-na	69-12	2 x 60	120	38.96	51.79	43.2	2 x 60	120	28.16	36.13	30.4
			89-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
47	NI	Nongkhaun	69-12	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
			89-24	2 x 60	120	52.05	67.47	56.2	2 x 60	120	59.55	77.01	61.2
48	NR	Nonthaburi	69-12	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
			89-12	1 x 40	40	19.11	24.77	61.9	x	0	0.00	0.00	0.0
49	NK	North Bangkok	69-12	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
			89-24	3 x 40	120	40.70	52.75	44.0	3 x 40	120	41.92	51.21	45.2
50	PE	Pakkred	69-12	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
			89-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
			115-12	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
51	PN	Paknas	69-12	3 x 60	180	75.43	97.77	54.3	3 x 60	180	72.15	99.73	52.1
			89-24	2 x 40	80	42.67	55.31	69.1	2 x 60	120	50.89	65.81	51.9
52	PS	Peichasom	69-12	1 x 40	40	41.86	58.14	68.6	2 x 22.4	44.8	25.71	39.30	71.3
			89-24	x	0	0.00	0.00	0.0	1 x 40	40	16.81	21.79	51.5
53	PI	Phaisongtho	69-12	1 x 40	40	17.15	22.23	55.6	x	0	0.00	0.00	0.0
			89-24	2 x 60	120	59.11	76.61	63.8	3 x 60	180	89.76	116.13	61.5

Appendix 6.3-4. Load and Installed Capacity of Distribution Substations (JICA Study Team Plan. Planning Year = 1997 - 2001)

No	ABB	Substation	Voltage (KV)	1996				1997				
				Bank configuration	Capacity (MVA)	coincident (MW)	non-coincident (MVA)	utilization factor (%)	Bank configuration	Capacity (MVA)	coincident (MW)	non-coincident (MVA)
54	PI	Ponjao	69-12 69-21	3 x 40 x	120 0	63.12 0	82.15 0.00	68.5 0.0	120 0	61.97 0	80.12 0.00	67.0 0.0
55	PC	Prachachuen	69-12 69-24	2 x 40 x	80 0	38.35 0	49.91 0.00	62.4 0.0	80 0	41.37 0	53.69 0.00	67.1 0.0
56	PK	Prakanong	69-12 69-24	2 x 40 x	80 0	42.86 0	55.78 0.00	68.7 0.0	80 0	43.11 0	55.91 0.00	69.9 0.0
57	PK	Prakasa	69-12 69-24	2 x 40 x	80 0	67.15 0	87.40 0.00	62.1 0.0	80 0	59.61 0	77.39 0.00	55.3 0.0
58	PO	Prauek	69-12 69-24	2 x 40 x	140 0	41.09 0	53.48 0.00	66.9 0.0	80 0	45.73 0	59.31 0.00	74.2 0.0
59	PO	Prapradueng	69-12 69-24	3 x 40 x	120 0	58.20 0	75.75 0.00	63.1 0.0	120 0	52.79 0	68.51 0.00	57.1 0.0
60	PA	Prasumit	69-12 69-24	3 x 40 x	120 0	61.15 0	79.59 0.00	66.3 0.0	120 0	50.45 0	65.17 0.00	54.6 0.0
61	PK	Prathavun	69-12 69-24	3 x 40 x	120 0	65.10 0	84.73 0.00	70.6 0.0	120 0	69.71 0	90.18 0.00	75.1 0.0
62	RT	Raainta	115-24	2 x 60 x	120 0	40.57 0	52.80 0.00	44.0 0.0	120 0	43.51 0	56.30 0.00	47.1 0.0
63	RH	Raakhaebang	69-12 69-24	2 x 40 x	140 0	52.12 0	67.84 0.00	48.5 0.0	140 0	55.06 0	71.15 0.00	51.0 0.0
64	RN	Rasburua	69-12 69-24	3 x 40 x	120 0	60.12 0	78.25 0.00	65.2 0.0	120 0	64.85 0	81.16 0.00	70.1 0.0
65	RK	Rongkiao	115-24	2 x 60 x	120 0	55.73 0	72.54 0.00	60.5 0.0	120 0	57.60 0	74.73 0.00	62.3 0.0
66	RC	Rongpracha	69-12 69-24	3 x 60 x	180 0	65.00 0	81.60 0.00	47.0 0.0	180 0	83.41 0	110.88 0.00	61.6 0.0
67	SN	Sailow	69-12 69-24	2 x 40 x	80 0	45.29 0	58.95 0.00	73.7 0.0	80 0	38.96 0	50.56 0.00	63.2 0.0
68	SR	Saaronk	69-12 69-24	2 x 40 x	80 0	20.00 0	26.03 0.00	32.5 0.0	80 0	19.15 0	24.85 0.00	31.1 0.0
69	SN	Saansen	69-12 69-24	3 x 40 x	120 0	58.22 0	77.08 0.00	64.2 0.0	120 0	62.36 0	80.92 0.00	67.4 0.0
70	SS	Saensab	69-12 69-24	1 x 40 x	40 0	16.44 0	21.40 0.00	53.5 0.0	40 0	19.92 0	25.85 0.00	64.6 0.0
71	SD	Sarandam	69-12 69-24	4 x 40 x	160 0	85.96 0	111.88 0.00	69.9 0.0	160 0	88.59 0	114.96 0.00	71.9 0.0
72	SP	Supanmai	69-12 69-24	2 x 60 x	120 0	51.70 0	67.29 0.00	56.1 0.0	120 0	46.31 0	60.10 0.00	50.1 0.0
73	SL	Silom	69-12 69-24	2 x 40 x	80 0	42.44 0	55.24 0.00	69.1 0.0	80 0	37.73 0	48.96 0.00	61.2 0.0
74	SY	Sipraya	69-12 69-24	2 x 40 x	80 0	41.06 0	53.14 0.00	66.8 0.0	80 0	41.35 0	53.66 0.00	67.1 0.0
75	SY	Soontijai	69-12 69-24	1 x 40 x	40 0	16.95 0	22.06 0.00	55.2 0.0	40 0	22.56 0	29.28 0.00	73.2 0.0
76	SK	South Bangkok	69-12 69-24	2 x 20 x	40 0	43.43 0	56.53 0.00	47.1 0.0	40 0	42.16 0	53.90 0.00	49.1 0.0
77	ST	South Thonburi	69-12 69-24	2 x (40) x	80 0	39.98 0	52.04 0.00	63.1 0.0	80 0	44.27 0	57.15 0.00	71.8 0.0
78	YA	Srithanya	69-12 115-12 115-24	1 x (10) x x	40 0 0	20.61 0 0	26.83 0.00 0.00	67.1 0.0 0.0	40 0 0	23.81 0 0	30.90 0.00 0.00	77.3 0.0 0.0
79	SO	Suansow	69-12 69-24	2 x 40 x	80 0	38.04 0	49.51 0.00	61.9 0.0	80 0	41.09 0	57.21 0.00	71.5 0.0

No	ABB	Substation	Voltage (KV)	1998				1999						
				Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MW)	utilization factor (%)	Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MW)	utilization factor (%)	
54	PJ	Poojao	69-12	3 x 40	120	64.46	83.58	69.7	0.0	3 x 40	120	70.96	91.91	76.6
			69-24	x	0	0.00	0.00	0.0	0.0	x	0	0.00	0.00	0.0
55	PC	Prachachuen	69-12	2 x 40	80	38.51	49.93	62.4	0.0	2 x 40	80	35.46	45.95	57.4
			69-24	x	0	0.00	0.00	0.0	0.0	x	0	0.00	0.00	0.0
56	PK	Prakanong	69-12	1 x 40	40	20.43	26.50	66.3	0.0	1 x 40	40	23.48	30.12	76.1
			69-24	1 x 40	40	20.69	26.34	67.1	0.0	1 x 40	40	21.21	31.36	78.1
57	PK	Prakas	115-24	2 x 60	120	61.03	79.11	65.5	0.0	2 x 60	120	63.51	82.29	68.8
			69-12	2 x 40	80	45.59	59.11	73.9	0.0	2 x 40	80	45.31	58.75	73.1
			69-24	x	0	0.00	0.00	0.0	0.0	x	0	0.00	0.00	0.0
59	PD	Praradaeng	69-12	3 x 40	120	66.35	86.04	71.7	0.0	3 x 40	120	45.76	61.48	53.7
			69-24	x	0	0.00	0.00	0.0	0.0	x	0	0.00	0.00	0.0
60	PA	Prasamit	69-12	2 x 40	80	41.79	54.19	67.7	0.0	2 x 40	80	41.06	53.13	66.1
			69-24	1 x 40	40	21.08	27.31	68.3	0.0	1 x 40	40	21.38	31.59	79.0
61	PN	Prathuan	69-12	3 x 40	120	54.58	70.77	59.0	0.0	3 x 40	120	73.17	91.81	79.0
			69-24	x	0	0.00	0.00	0.0	0.0	x	0	0.00	0.00	0.0
62	RT	Rasitira	115-24	2 x 60	120	45.26	58.82	49.0	0.0	2 x 60	120	46.26	59.91	50.0
			69-12	x	0	0.00	0.00	0.0	0.0	x	0	0.00	0.00	0.0
63	RI	Rakhae haeng	69-24	2 x 60	120	56.53	73.30	52.1	0.0	2 x 60	120	57.30	71.25	52.0
64	RN	Rasburana	69-12	3 x 40	120	69.52	90.15	75.1	0.0	3 x 40	120	72.30	93.68	78.1
			69-24	x	0	0.00	0.00	0.0	0.0	x	0	0.00	0.00	0.0
65	RK	Romkao	115-24	2 x 60	120	59.43	77.06	64.2	0.0	2 x 60	120	62.36	80.80	67.3
66	RC	Rungprachu	69-12	3 x 60	180	72.33	93.79	52.1	0.0	3 x 60	180	78.59	101.83	56.5
			69-24	2 x 40	80	38.71	50.20	62.8	0.0	2 x 40	80	40.54	52.53	65.7
67	SK	Sailom	69-12	2 x 40	80	22.52	29.20	36.5	0.0	1 x 40	40	12.00	15.55	38.9
			69-24	1 x 60	60	11.00	14.26	23.8	0.0	2 x 60	120	28.82	38.61	32.2
68	SK	Saerong	69-12	3 x 40	120	65.05	84.85	70.3	0.0	3 x 40	120	67.87	87.91	73.3
			69-24	x	0	0.00	0.00	0.0	0.0	x	0	0.00	0.00	0.0
70	SS	Sansub	69-12	1 x 40	40	20.71	26.86	67.1	0.0	1 x 40	40	21.51	27.91	69.8
			69-24	2 x 40	80	41.52	53.84	57.3	0.0	2 x 40	80	43.18	55.95	69.9
71	SD	Sapandae	69-12	4 x 40	160	93.52	121.27	75.8	0.0	1 x 40	40	95.72	125.32	78.3
			69-24	x	0	0.00	0.00	0.0	0.0	x	0	0.00	0.00	0.0
72	SP	Sopamea	69-12	2 x 60	120	48.16	62.45	52.0	0.0	2 x 60	120	50.09	61.90	51.1
			69-24	2 x 40	80	35.49	46.02	57.5	0.0	2 x 40	80	31.80	45.09	56.1
73	SL	Silom	69-12	2 x 40	80	42.21	54.73	68.4	0.0	2 x 40	80	39.79	51.56	61.5
			69-24	x	0	0.00	0.00	0.0	0.0	x	0	0.00	0.00	0.0
74	SY	Sipraya	69-12	1 x 40	40	23.47	30.43	76.1	0.0	1 x 40	40	21.32	27.63	69.1
			69-24	2 x 60	120	47.21	61.22	51.0	0.0	2 x 60	120	52.10	67.51	56.3
75	SY	Sawwijai	69-12	2 x 20	40	12.65	16.40	41.0	0.0	2 x 20	40	14.15	18.33	45.8
			69-24	x	0	0.00	0.00	0.0	0.0	x	0	0.00	0.00	0.0
76	SA	South Bangkok	69-12	2 x (40)	80	44.30	57.41	71.8	0.0	1 x (40)	40	21.78	28.22	70.6
			69-24	x	0	0.00	0.00	0.0	0.0	1 x 60	60	26.09	33.81	56.3
77	ST	South Thonburi	69-12	1 x (40)	40	23.69	30.72	76.8	0.0	x	0	0.00	0.00	0.0
			115-12	x	0	0.00	0.00	0.0	0.0	1 x (40)	40	20.38	26.11	68.0
78	YA	Sriuthaya	115-12	2 x 40	80	46.14	59.83	74.8	0.0	2 x 40	80	45.37	58.78	73.5
			69-12	x	0	0.00	0.00	0.0	0.0	x	0	0.00	0.00	0.0
79	SO	Suansom	69-12	2 x 40	80	46.14	59.83	74.8	0.0	2 x 40	80	45.37	58.78	73.5
			69-24	x	0	0.00	0.00	0.0	0.0	x	0	0.00	0.00	0.0

Appendix 6.3-4 Load and Installed Capacity of Distribution Substations (JICA Study Team Plan, Planning Year = 1997 - 2001)

No.	ABB	Substation	Voltage (KV)	2000				2001				
				Bank configuration	Capacity (MVA)	coincident (MW)	non-coinc. (MVA)	utilization factor (%)	Bank configuration	Capacity (MVA)	coincident (MW)	non-coinc. (MVA)
54	PJ	Poojao	69-12	3 x 40	120	72.04	93.38	77.8	0	0.00	89.17	71.6
55	PC	Prachachuen	69-24	x	0	0.00	0.00	0.0	120	69.15	89.17	71.6
56	PK	Prakanong	69-12	2 x 40	80	45.04	58.38	73.0	0	0.00	0.00	0.0
57	PK	Prakasa	69-24	x	0	0.00	0.00	0.0	100	37.63	48.68	18.7
58	PL	Pranok	69-12	1 x 40	40	23.59	30.57	76.4	0	0.00	0.00	0.0
59	PL	Pruraduang	69-24	1 x 40	40	22.25	28.81	72.1	2 x 40	10.19	52.00	65.0
60	PL	Prasmit	115-24	2 x 60	120	65.11	81.82	60.8	2 x 40	68.14	88.55	63.3
61	PL	Prathuan	69-12	1 x 40	40	22.59	29.28	73.2	0	0.00	0.00	0.0
62	PL	Prathuan	69-24	1 x 40	40	12.01	15.57	38.9	2 x 40	35.61	46.11	57.6
63	PL	Prathuan	69-12	3 x 40	120	51.40	66.62	55.5	120	58.09	75.16	62.6
64	PL	Prathuan	69-24	x	0	0.00	0.00	0.0	0	0.00	0.00	0.0
65	PL	Prathuan	69-12	x	0	0.00	0.00	0.0	0	0.00	0.00	0.0
66	PL	Prathuan	69-24	3 x 40	120	61.00	79.07	65.9	120	62.83	81.29	67.7
67	PL	Prathuan	69-12	3 x 40	120	67.12	87.00	74.5	140	55.19	71.79	51.3
68	PL	Prathuan	69-24	3 x 40	120	64.47	83.56	69.5	120	66.11	85.92	71.6
69	PL	Prathuan	69-12	2 x 60	120	49.74	64.47	59.7	0	0.00	0.00	0.0
70	PL	Prathuan	69-24	x	0	0.00	0.00	0.0	0	0.00	0.00	0.0
71	PL	Prathuan	69-12	2 x 60	120	55.65	72.13	60.1	120	56.65	72.32	60.1
72	PL	Prathuan	69-24	3 x 60	180	84.02	108.90	60.5	180	75.30	97.68	54.3
73	PL	Prathuan	69-12	2 x 40	80	45.11	58.48	73.1	80	45.88	59.31	74.2
74	PL	Prathuan	69-24	x	0	0.00	0.00	0.0	0	0.00	0.00	0.0
75	PL	Prathuan	69-12	1 x 40	40	12.82	16.62	41.5	0	0.00	0.00	0.0
76	PL	Prathuan	69-24	2 x 60	120	38.25	49.58	41.3	180	61.91	80.10	41.5
77	PL	Prathuan	69-12	3 x 40	120	67.36	87.31	72.8	80	41.21	53.32	66.7
78	PL	Prathuan	69-24	3 x 40	120	64.47	83.56	69.5	40	23.31	30.20	75.5
79	PL	Prathuan	69-12	1 x 40	40	20.00	25.92	64.8	40	18.86	24.40	61.0
80	PL	Prathuan	69-24	2 x 40	80	33.33	43.20	54.0	80	41.81	51.09	67.6
81	PL	Prathuan	69-12	4 x 40	160	98.12	127.18	79.5	160	81.58	109.13	68.1
82	PL	Prathuan	69-24	x	0	0.00	0.00	0.0	0	0.00	0.00	0.0
83	PL	Prathuan	69-12	2 x 60	120	51.59	66.87	55.7	120	53.14	68.75	57.3
84	PL	Prathuan	69-24	2 x 40	80	46.19	59.87	74.8	80	37.10	48.00	60.0
85	PL	Prathuan	69-12	2 x 40	80	40.98	53.12	66.4	0	0.00	0.00	0.0
86	PL	Prathuan	69-24	x	0	0.00	0.00	0.0	0	0.00	0.00	0.0
87	PL	Prathuan	69-12	1 x 40	40	23.76	30.80	77.0	40	21.02	27.20	68.0
88	PL	Prathuan	69-24	2 x 60	120	60.00	77.77	64.8	120	56.57	60.25	56.2
89	PL	Prathuan	69-12	2 x 20	40	17.03	22.08	55.2	0	0.00	0.00	0.0
90	PL	Prathuan	69-24	x	0	0.00	0.00	0.0	0	0.00	0.00	0.0
91	PL	Prathuan	69-12	x	0	0.00	0.00	0.0	0	0.00	0.00	0.0
92	PL	Prathuan	69-24	2 x 60	120	54.16	70.20	58.5	120	53.18	69.19	57.1
93	PL	Prathuan	69-12	1 x 40	40	0.00	0.00	0.0	0	0.00	0.00	0.0
94	PL	Prathuan	115-12	1 x (40)	40	24.05	31.18	77.9	40	19.12	21.71	61.8
95	PL	Prathuan	115-24	x	0	0.00	0.00	0.0	0	0.00	0.00	0.0
96	PL	Prathuan	69-12	2 x 40	80	44.21	57.30	71.6	0	0.00	0.00	0.0
97	PL	Prathuan	69-24	x	0	0.00	0.00	0.0	120	55.11	71.30	59.1

No.	ABB	Substation	Voltage (KV)	1986				1997				
				Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)
80	SU	Surawong	69-12 69-24	3 X 40 X	120 0	60.74 0	79.06 0.00	65.9 0.0	120 0	71.42 0.00	92.68 0.00	77.2 0.0
81	TS	Taksin	69-12 69-24	1 X 40 1 X 40	40 40	18.68 16.00	24.31 20.83	60.8 52.1	40 40	20.63 19.00	26.77 21.66	66.9 61.6
82	TP	Teprarak	69-24	2 X 40	60	77.54	100.92	72.1	60	68.71	89.16	63.7
83	TT	Thanontok	69-12 69-24	1 X 40 X	40 0	28.61 0.00	37.24 0.00	93.1 0.0	40 0	21.31 0.00	31.55 0.00	78.9 0.0
84	TB	Thonburi	69-12 69-24	2 X 40 1 X 60	80 60	44.00 20.04	57.27 26.08	71.6 43.5	80 60	38.09 17.72	49.43 23.00	61.8 38.3
85	TN	Tongkung	69-12 69-24	2 X 40 X	80 0	41.63 0.00	54.18 0.00	67.7 0.0	80 0	43.26 0.00	56.11 0.00	70.2 0.0
86	YB	Kampetchaboon	69-12 69-24	2 X 40 X	80 0	56.60 0.00	73.67 0.00	92.1 0.0	80 0	39.77 0.00	51.61 0.00	61.5 0.0
87	YT	Kangthongtiang	69-12 69-24	X 3 X 60	0 180	64.73 84.25	0.00 46.8	0.0 46.8	0 180	0.00 70.72	0.00 81.77	0.0 51.0
88	YL	Fallicob	69-12 69-24	3 X 40 X	120	61.34	83.74	69.8	120	69.63	90.36	75.3
89	YT	Yothee	69-12 69-24	2 X 40 X	80	34.63	45.07	56.3	80	39.92	51.80	64.8
90	BE	Bangkac	69-12 115-12 115-24	1 X 40 X X	40 0 0	22.49 0.00 0.00	28.27 0.00 0.00	73.2 0.0 0.0	40 0 0	23.90 0.00 0.00	31.02 0.00 0.00	77.5 0.0 0.0
91	BZ	Bangson	69-12 69-24	1 X (40) X	40 0	32.00 0.00	41.65 0.00	104.1 0.0	80 0	33.04 0.00	42.83 0.00	53.6 0.0
92	RI	Searing	69-24 115-24	1 X 60 X	60 0	44.05	57.33	95.6	0	0.00	0.00	0.0
93	EM	Ekamai	69-12 69-24 115-24	1 X (40) X X	40 0 0	30.31	39.45	98.6	40	40.97	53.17	66.5
94	EB	Ekaburi	115-24	1 X 60	60	16.00	20.83	31.7	60	18.00	23.36	38.9
95	IA	Iluwak	69-12 69-24 115-24	1 X 40 X X	40 0 0	19.51	25.39	63.5	40	22.28	28.91	72.3
96	IN	Intamara	69-12 69-24	2 X 60 X	120 0	36.03	46.90	39.1	120	40.10	52.01	43.4
97	JK	Jungroon	69-12 69-24	1 X (40) X	40 0	16.33	21.25	53.1	40	17.68	22.91	57.1
98	KO	Khoter	115-24	1 X 60	60	40.48	52.66	87.8	120	45.99	59.68	49.7
99	KI	Kinkae	115-24	2 X 60	120	40.47	52.67	43.9	120	41.83	51.28	45.2
100	SU	Kongphasawud	115-24	2 X 50	120	41.20	53.62	41.7	120	47.30	61.38	51.2
101	LB	Lardkrabang	115-24	2 X 60	120	31.98	41.62	34.7	120	40.65	52.75	44.0
102	MS	Meangthong 3	115-24	1 X 60	60	31.00	41.25	73.8	120	42.06	51.58	45.5
103	MS	Moosoc	69-12 69-24	2 X (40) X	80 0	30.69	39.94	49.9	80	33.67	43.69	51.6
104	PP	Pradipat	69-12 69-24	2 X (40) X	80 0	37.76	49.15	61.4	80	40.22	52.20	65.3
105	SA	Saimatip	69-12 69-24 115-24	X 1 X 60 X	0 60 0	36.54	47.56	79.3	40	18.23	24.66	59.1
106	SB	Sarabinnam	69-12 69-24	1 X (40) 1 X 60	40 60	20.22	26.32	65.8	0	0.00	0.00	0.0

Appendix 6.3-4 Load and Installed Capacity of Distribution Substations (JICA Study Team Plan, Planning Year = 1997 - 2001) (11/21)

No	ABB	Substation	Voltage (KV)	1998				1999					
				Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)
80	SU	Surawong	69-12	3 x 40	120	72.63	94.18	78.5	3 x 40	120	65.71	85.11	71.0
			69-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
81	TS	Taksin	69-12	1 x 40	40	19.21	24.91	62.3	x	0	0.00	0.00	0.0
			69-24	1 x 40	40	22.00	28.53	71.3	2 x 40	80	42.86	55.51	69.1
82	TP	Teparak	69-24	2 x 40	80	75.90	98.12	76.3	2 x 40	80	83.21	107.82	77.0
			69-12	1 x 40	40	43.31	56.16	70.2	1 x 40	40	45.14	58.49	73.1
			69-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
84	TB	Thonburi	69-12	2 x 40	80	36.98	47.96	60.0	2 x 40	80	36.54	47.31	59.2
			69-24	1 x 60	60	23.23	30.12	50.2	1 x 60	60	29.18	38.20	63.7
85	TK	Tongkung	69-12	2 x 40	80	41.99	58.34	72.9	2 x 40	80	45.29	58.68	73.4
			69-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
86	TB	Tungpetchabun	69-12	2 x 40	80	41.37	53.64	67.1	2 x 40	80	63.70	82.51	68.8
			69-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
87	TT	Tungthonglang	69-12	3 x 60	180	74.56	96.58	53.7	3 x 60	180	67.86	87.93	48.9
			69-24	3 x 40	120	72.25	93.70	78.1	3 x 40	120	69.65	90.25	75.2
88	TL	Tallich	69-12	2 x 40	80	41.52	53.84	67.3	2 x 40	80	43.18	55.95	69.9
			69-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
89	TT	Tothce	69-12	1 x 40	40	24.65	31.97	79.9	x	0	0.00	0.00	0.0
			69-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
90	BE	Bangkok	115-12	2 x 60	120	23.17	30.05	75.1	1 x 40	40	20.10	26.01	65.1
			115-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
91	BZ	Bangson	69-12	2 x 40	80	37.16	48.19	60.2	1 x 40	40	24.37	31.58	78.9
			69-24	x	0	0.00	0.00	0.0	1 x 60	60	23.92	30.99	51.7
92	RI	Rearing	69-24	2 x 60	120	52.73	68.38	57.0	2 x 60	120	55.04	71.32	59.1
			115-24	2 x 60	120	52.73	68.38	57.0	2 x 60	120	55.04	71.32	59.1
93	EM	Ekamai	69-12	1 x 40	40	21.81	28.28	70.7	1 x 40	40	22.68	29.39	73.5
			69-24	2 x 60	120	54.77	71.02	59.2	2 x 60	120	56.97	73.82	61.5
			115-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
94	EB	Ekhuri	115-24	1 x 60	60	20.54	26.63	44.4	1 x 60	60	21.36	27.69	46.1
95	HA	Huamak	69-12	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
			69-24	1 x 40	40	23.17	30.05	75.1	1 x 40	40	20.10	26.01	65.1
			115-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
96	IN	Intamura	69-24	2 x 60	120	41.71	54.09	45.1	2 x 60	120	43.37	56.20	46.8
97	JK	Jangron	69-12	1 x 40	40	18.39	23.85	59.6	1 x 40	40	19.13	24.79	62.0
			69-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
98	KT	Khoter	115-24	2 x 60	120	49.77	64.54	59.8	2 x 60	120	55.37	72.00	60.0
99	KI	Kingcau	115-24	2 x 60	120	42.50	55.11	45.9	2 x 60	120	50.87	65.91	51.9
100	KH	Khongabussand	115-24	2 x 60	120	50.90	66.00	55.0	2 x 60	120	52.82	68.11	57.0
101	LB	Lardkrabang	115-24	2 x 60	120	49.51	64.24	59.3	2 x 60	120	44.70	57.92	48.3
102	KS	Muangthong 3	115-24	2 x 60	120	51.14	70.20	58.5	2 x 60	120	56.31	72.95	60.8
103	KS	Nonsoc	69-12	1 x 40	40	15.79	20.48	51.2	1 x 40	40	11.23	14.55	36.1
			69-24	1 x 60	60	20.10	26.06	43.4	1 x 60	60	26.10	33.82	56.1
104	PP	Pradiput	69-12	2 x 40	80	38.59	50.04	62.6	2 x 40	80	42.17	54.81	68.3
			69-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
105	SA	Sainatip	69-12	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
			69-24	2 x 60	120	46.11	60.17	50.2	2 x 60	120	48.81	63.25	52.7
			115-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
106	SB	Suanabinnua	69-12	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
			69-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0

No	ABB	Substation	Voltage (KV)	2000				2001					
				Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)
80	SU	Surawong	69-12	3 x 40	120	67.68	87.72	73.1	1 x 40	40	23.51	30.12	76.0
			69-24	x	0	0.00	0.00	0.0	x	120	46.20	59.77	49.8
81	TS	Taksin	69-12	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
			69-24	2 x 40	80	44.15	57.23	71.5	2 x 40	80	37.17	48.18	50.6
82	TP	Teparak	69-24	2 x 40	140	79.14	102.57	73.3	2 x 40	140	70.60	91.31	55.2
83	TT	Tranontok	69-12	1 x 40	80	40.94	53.97	66.3	x	0	0.00	0.00	0.0
			69-24	x	0	0.00	0.00	0.0	x	80	42.45	54.92	68.7
84	TB	Thamburi	69-12	2 x 40	80	40.75	52.82	66.0	2 x 40	80	29.15	38.10	53.5
			69-24	1 x 60	60	27.03	35.06	58.4	1 x 60	60	0	0.00	0.0
85	TK	Tongkung	69-12	2 x 40	80	42.64	55.27	69.1	x	0	0.00	0.00	0.0
			69-24	x	0	0.00	0.00	0.0	2 x 40	80	41.40	53.56	67.8
86	TB	Thangphaboon	69-12	2 x 40	120	65.74	85.21	71.0	2 x 40	120	55.82	72.0	65.2
			69-24	x	0	0.00	0.00	0.0	3 x 60	180	83.28	107.75	59.9
87	VT	Vanghonglang	69-12	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
			69-24	3 x 60	180	69.90	90.60	50.3	3 x 60	180	77.22	99.90	55.5
88	VL	Vatlieb	69-12	3 x 40	120	73.22	94.90	79.1	3 x 40	120	66.82	86.15	72.0
89	VT	Yothec	69-12	2 x 40	80	44.48	57.65	72.1	2 x 40	80	44.10	57.05	71.3
			69-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
90	BE	Bongkac	69-12	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
			115-12	2 x (40)	80	45.94	59.55	74.4	1 x (40)	40	22.52	29.14	72.8
			115-24	x	0	0.00	0.00	0.0	1 x 60	60	30.24	39.12	65.2
91	BZ	Bangson	69-12	1 x (40)	40	23.51	30.52	76.3	x	0	0.00	0.00	0.0
			69-24	1 x 60	60	28.64	37.12	61.9	2 x 60	120	42.80	55.37	46.1
92	R1	Bearing	69-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
			115-24	2 x 60	120	56.84	73.67	61.4	2 x 60	120	63.69	82.40	68.7
93	EW	Ekaeni	69-12	1 x (40)	40	21.67	28.09	70.2	1 x (40)	40	19.94	25.80	64.5
			69-24	2 x 60	120	58.00	75.18	62.7	2 x 60	120	62.12	80.37	67.0
			115-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
94	EB	Ebburi	115-24	2 x 60	120	30.00	38.89	32.4	2 x 60	120	41.20	53.30	41.1
95	HA	Huamak	69-12	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
			69-24	1 x 40	40	20.70	26.83	67.1	1 x 60	60	21.32	27.58	46.0
			115-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
96	IN	Intamira	69-24	2 x 60	120	44.68	57.91	48.3	2 x 60	120	46.02	59.51	49.6
97	JR	Jangron	69-12	1 x (40)	40	23.70	30.72	76.8	1 x (40)	40	21.41	31.58	79.0
			69-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
98	KD	Khoron	115-24	2 x 60	120	51.08	66.21	55.2	3 x 60	180	71.51	96.10	53.6
99	K1	Kingacor	115-24	2 x 60	120	53.57	69.44	57.9	2 x 60	120	56.79	73.17	61.2
100	KH	Khongkasawand	115-24	2 x 60	120	50.41	65.34	54.5	2 x 60	120	51.92	67.17	56.0
101	LB	Lardkrabang	115-24	2 x 60	120	46.72	60.56	50.5	2 x 60	120	49.27	63.71	53.1
102	M3	Muanghong 3	115-24	2 x 60	120	58.00	75.18	62.7	2 x 60	120	60.71	78.58	65.5
103	NS	Nonsoc	69-12	1 x (40)	40	14.72	19.08	47.1	x	0	0.00	0.00	0.0
			69-24	1 x 60	60	26.88	34.84	58.1	2 x 60	120	49.04	55.68	46.1
104	PT	Pradipat	69-12	2 x (40)	80	45.24	58.63	73.3	1 x (40)	40	22.25	29.79	72.0
			69-24	x	0	0.00	0.00	0.0	1 x 60	60	31.07	40.20	61.0
105	SA	Sainatip	69-12	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
			69-24	2 x 60	120	61.81	84.00	70.0	3 x 60	180	62.23	80.59	41.9
			115-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
106	SB	Suabhinam	69-12	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0
			69-24	x	0	0.00	0.00	0.0	x	0	0.00	0.00	0.0

Appendix 6.3-4 Load and Installed Capacity of Distribution Substations (JICA Study Team Plan. Planning Year = 1997 - 2001)

No	ABB	Substation	Voltage (KV)	1996				1997						
				Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	
			115-12	x	0	0	0.00	0.0	0.0	1 x (10)	40	21.02	31.17	77.9
			115-24	x	0	0	0.00	0.0	0.0	1 x 50	60	20.00	25.95	43.3
107	SC	Suorahong	115-24	1 x 60	60	23.16	30.14	50.2	30.15	1 x 50	60	30.10	39.15	65.8
108	OB	Swath Bungtee	115-24	1 x 60	60	36.22	47.14	78.6	43.33	2 x 60	120	43.33	56.23	46.9
109	SE	Sriela	115-24	2 x 60	120	42.13	54.83	45.7	51.83	2 x 60	120	60.69	78.76	65.6
110	SC	Saunthong	69-24	x	0	0	0.00	0.0	0.0	x	0	0.00	0.00	0.0
			115-24	3 x 60	180	78.55	102.21	56.3	102.21	2 x (40)	80	37.86	49.13	61.4
111	UK	Suresak	69-12	1 x (40)	40	21.34	31.68	79.2	31.68	2 x (40)	80	37.86	49.13	61.4
			69-24	x	0	0	0.00	0.0	0.0	x	0	0.00	0.00	0.0
112	TV	Taibun	115-24	x	0	0	0.00	0.0	0.0	1 x 50	60	32.28	41.86	69.8
113	TF	Tasevattana	115-24	1 x 60	60	20.44	26.60	41.3	26.60	1 x 60	60	22.28	28.91	48.2
114	TR	Thonburitrom	69-12	1 x (40)	40	21.00	27.33	68.3	27.33	1 x (40)	40	23.99	30.36	75.9
			115-24	x	0	0	0.00	0.0	0.0	x	0	0.00	0.00	0.0
115	TH	Tungsonghong	69-24	x	0	0	0.00	0.0	0.0	x	0	0.00	0.00	0.0
			115-24	2 x 60	120	31.20	44.51	37.1	44.51	2 x 60	120	43.95	57.03	47.5
116	VK	Yonarkat	69-12	2 x (40)	80	45.60	59.35	74.2	59.35	2 x (40)	80	41.55	57.81	72.3
			69-24	x	0	0	0.00	0.0	0.0	x	0	0.00	0.00	0.0
117	AB	Bangbor	115-24	1 x 60	60	16.10	20.96	34.9	20.96	2 x 60	120	20.00	25.95	21.6
118	JK	Bangjak	69-12	x	0	0	0.00	0.0	0.0	x	0	0.00	0.00	0.0
			115-12	1 x (40)	40	16.32	21.24	53.1	21.24	1 x (10)	40	13.00	16.87	42.2
			115-24	x	0	0	0.00	0.0	0.0	x	0	0.00	0.00	0.0
119	AD	Bungkradse	69-12	1 x (40)	40	12.10	15.75	39.4	15.75	1 x (40)	40	11.50	14.92	37.3
			115-24	x	0	0	0.00	0.0	0.0	x	0	0.00	0.00	0.0
120	BU	Bangshan	115-24	1 x 60	60	17.18	22.36	37.3	22.36	1 x 60	60	17.82	23.13	38.5
121	BI	Banrai	69-24	x	0	0	0.00	0.0	0.0	x	0	0.00	0.00	0.0
122	DD	Dindong	69-12	x	0	0	0.00	0.0	0.0	1 x (10)	40	17.36	22.53	56.3
			115-12	x	0	0	0.00	0.0	0.0	x	0	0.00	0.00	0.0
			115-24	x	0	0	0.00	0.0	0.0	x	0	0.00	0.00	0.0
123	EC	Etachai	69-12	1 x (40)	40	10.40	13.54	33.8	13.54	1 x (10)	40	11.00	14.28	35.7
			115-24	x	0	0	0.00	0.0	0.0	x	0	0.00	0.00	0.0
124	CK	Choaklang	69-24	1 x 60	60	16.00	20.83	31.7	20.83	2 x 60	120	17.00	22.06	48.1
			115-24	x	0	0	0.00	0.0	0.0	x	0	0.00	0.00	0.0
125	JV	Jangvairana	115-24	1 x 60	60	42.97	55.93	93.2	55.93	2 x 60	120	46.36	60.16	50.1
126	JJ	Jatujak	69-12	x	0	0	0.00	0.0	0.0	x	0	0.00	0.00	0.0
			69-24	x	0	0	0.00	0.0	0.0	x	0	0.00	0.00	0.0
			115-24	x	0	0	0.00	0.0	0.0	x	0	0.00	0.00	0.0
127	KE	Kaset	69-12	x	0	0	0.00	0.0	0.0	x	0	0.00	0.00	0.0
			69-24	x	0	0	0.00	0.0	0.0	x	0	0.00	0.00	0.0
128	KC	Klongkuan	115-24	x	0	0	0.00	0.0	0.0	1 x 60	60	22.00	28.55	47.6
129	KL	Klongprapa	115-24	1 x 60	60	8.24	10.73	17.9	10.73	1 x 60	60	12.00	15.57	26.0
130	KU	Khir-udom	69-12	1 x 40	40	26.16	34.05	85.1	34.05	1 x 40	40	10.00	12.98	32.1
			69-24	x	0	0	0.00	0.0	0.0	x	0	0.00	0.00	0.0
131	KI	Kuangthong 4	115-24	x	0	0	0.00	0.0	0.0	1 x 60	60	28.56	37.06	61.8
132	K5	Kuangthong 5	115-24	x	0	0	0.00	0.0	0.0	x	0	0.00	0.00	0.0
133	K6	Kuangthong 6	115-24	x	0	0	0.00	0.0	0.0	x	0	0.00	0.00	0.0
134	K7	Kuangthong 7	115-24	x	0	0	0.00	0.0	0.0	x	0	0.00	0.00	0.0
135	NI	Nanglerok	69-12	x	0	0	0.00	0.0	0.0	x	0	0.00	0.00	0.0
136	TA	Tatunakorn	115-24	x	0	0	0.00	0.0	0.0	x	0	0.00	0.00	0.0
137	PL	Plubpla	115-24	x	0	0	0.00	0.0	0.0	x	0	0.00	0.00	0.0

No	ABD	Substation	Voltage (KV)	1998				1999					
				Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)
				1 x (40)	40	20.49	26.57	66.4	1 x (40)	40	23.05	29.87	74.7
			115-12	1 x 60	60	26.32	34.13	56.9	1 x 60	60	29.83	38.39	64.0
107	RG	Suvarnabhong	115-24	1 x 60	60	28.57	37.04	61.7	1 x 60	60	31.38	40.53	67.7
			115-24	2 x 60	120	45.21	58.66	48.9	2 x 60	120	49.01	63.53	53.0
108	OR	South Bangkok	115-21	2 x 60	120	68.32	88.59	73.8	2 x 60	120	66.67	86.39	72.0
			115-21	2 x 60	120	68.32	88.59	73.8	2 x 60	120	66.67	86.39	72.0
109	SE	Sriwien	69-24	3 x 60	180	70.98	92.04	51.1	3 x 60	180	66.81	86.60	48.1
			69-24	2 x (40)	80	44.10	57.19	71.3	2 x (40)	80	43.00	55.72	69.7
110	SC	Suanluang	115-24	2 x 60	120	0.00	0.00	0.0	2 x 60	120	0.00	0.00	0.0
			69-12	1 x 60	60	31.48	40.83	68.0	1 x 60	60	36.18	46.88	78.1
111	IK	Surasak	115-21	2 x 60	120	42.52	55.11	46.0	2 x 60	120	50.31	63.23	51.1
			115-21	2 x (40)	80	43.53	56.44	70.6	2 x (40)	80	40.61	52.62	65.8
112	TN	Taibon	69-24	2 x 60	120	0.00	0.00	0.0	2 x 60	120	0.00	0.00	0.0
			69-24	2 x 60	120	37.39	48.48	40.4	2 x 60	120	38.89	50.39	42.0
113	TP	Taveewattana	115-24	2 x 60	120	0.00	0.00	0.0	2 x 60	120	0.00	0.00	0.0
			69-12	2 x (40)	80	44.39	57.56	72.0	2 x (40)	80	46.13	59.77	71.7
114	TK	Thonburirom	115-21	2 x 60	120	22.23	28.83	24.0	2 x 60	120	23.12	29.96	25.0
			115-21	2 x 60	120	22.23	28.83	24.0	2 x 60	120	23.12	29.96	25.0
115	TL	Tungsoyong	69-24	2 x 60	120	0.00	0.00	0.0	2 x 60	120	0.00	0.00	0.0
			69-24	2 x 60	120	37.39	48.48	40.4	2 x 60	120	38.89	50.39	42.0
116	YK	Yemahart	115-24	2 x 60	120	0.00	0.00	0.0	2 x 60	120	0.00	0.00	0.0
			69-12	2 x (40)	80	44.39	57.56	72.0	2 x (40)	80	46.13	59.77	71.7
117	AB	Bangbor	115-24	2 x 60	120	26.35	34.17	28.5	2 x 60	120	35.61	45.11	38.5
			69-12	2 x 60	120	26.35	34.17	28.5	2 x 60	120	35.61	45.11	38.5
118	JK	Bangjak	115-12	1 x (40)	40	16.93	21.95	54.9	1 x (40)	40	18.14	23.51	58.8
			115-12	1 x (40)	40	16.93	21.95	54.9	1 x (40)	40	18.14	23.51	58.8
119	AD	Bangkradec	69-12	1 x (40)	40	12.00	15.56	38.9	1 x (40)	40	13.66	17.58	47.0
			69-12	1 x (40)	40	12.00	15.56	38.9	1 x (40)	40	13.66	17.58	47.0
120	BH	Bangshien	115-24	2 x 60	120	0.00	0.00	0.0	2 x 60	120	0.00	0.00	0.0
			69-24	2 x 60	120	0.00	0.00	0.0	2 x 60	120	0.00	0.00	0.0
121	MI	Burasi	69-24	1 x (40)	40	18.85	24.44	61.1	1 x (40)	40	19.61	25.41	63.5
			69-12	1 x (40)	40	18.85	24.44	61.1	1 x (40)	40	19.61	25.41	63.5
122	DO	Birdseng	115-12	1 x 60	60	0.00	0.00	0.0	1 x 60	60	0.00	0.00	0.0
			115-12	1 x 60	60	0.00	0.00	0.0	1 x 60	60	0.00	0.00	0.0
123	EC	Esachai	69-12	1 x (40)	40	13.00	16.86	42.1	1 x (40)	40	15.00	19.11	32.1
			69-12	1 x (40)	40	13.00	16.86	42.1	1 x (40)	40	15.00	19.11	32.1
124	OK	Choklang	115-24	2 x 60	120	18.71	24.26	20.2	2 x 60	120	34.36	44.52	37.1
			115-24	2 x 60	120	18.71	24.26	20.2	2 x 60	120	34.36	44.52	37.1
125	JV	Jangulana	115-24	2 x 60	120	59.49	77.11	61.3	2 x 60	120	59.87	77.58	61.7
			69-12	2 x (40)	80	25.00	32.42	40.5	2 x (40)	80	29.00	37.58	47.0
126	JJ	Jatujak	69-24	2 x 60	120	0.00	0.00	0.0	2 x 60	120	0.00	0.00	0.0
			69-24	2 x 60	120	0.00	0.00	0.0	2 x 60	120	0.00	0.00	0.0
127	KE	Kusol	69-12	1 x (40)	40	16.77	21.75	54.4	1 x (40)	40	18.69	24.09	52.6
			69-12	1 x (40)	40	16.77	21.75	54.4	1 x (40)	40	18.69	24.09	52.6
128	KC	Klongkum	115-24	1 x 60	60	33.12	42.95	71.6	1 x 60	60	41.11	57.58	48.0
			115-24	1 x 60	60	33.12	42.95	71.6	1 x 60	60	41.11	57.58	48.0
129	KL	Klongprap	69-12	1 x 60	60	16.48	21.37	35.6	1 x 60	60	18.11	21.89	41.3
			69-12	1 x 60	60	16.48	21.37	35.6	1 x 60	60	18.11	21.89	41.3
130	NU	Nitruwra	69-24	1 x 40	40	12.36	16.03	40.1	1 x 40	40	12.85	16.65	41.6
			69-24	1 x 40	40	12.36	16.03	40.1	1 x 40	40	12.85	16.65	41.6
131	NI	Nuangthong 4	115-24	2 x 60	120	60.00	77.80	61.8	2 x 60	120	59.10	76.97	61.1
			115-24	2 x 60	120	60.00	77.80	61.8	2 x 60	120	59.10	76.97	61.1
132	N5	Nuangthong 5	115-24	2 x 60	120	0.00	0.00	0.0	2 x 60	120	0.00	0.00	0.0
			115-24	2 x 60	120	0.00	0.00	0.0	2 x 60	120	0.00	0.00	0.0
133	N6	Nuangthong 6	115-21	2 x 60	120	0.00	0.00	0.0	2 x 60	120	0.00	0.00	0.0
			115-21	2 x 60	120	0.00	0.00	0.0	2 x 60	120	0.00	0.00	0.0
134	N7	Nuangthong 7	115-21	2 x 60	120	0.00	0.00	0.0	2 x 60	120	0.00	0.00	0.0
			115-21	2 x 60	120	0.00	0.00	0.0	2 x 60	120	0.00	0.00	0.0
135	NL	Nuangjeng	69-12	1 x 60	60	9.00	0.00	0.0	1 x 60	60	11.36	18.61	31.0
			69-12	1 x 60	60	9.00	0.00	0.0	1 x 60	60	11.36	18.61	31.0
136	TA	Patunakarn	115-24	2 x 60	120	0.00	0.00	0.0	2 x 60	120	0.00	0.00	0.0
			115-24	2 x 60	120	0.00	0.00	0.0	2 x 60	120	0.00	0.00	0.0
137	PL	Phlopha	115-24	2 x 60	120	0.00	0.00	0.0	2 x 60	120	0.00	0.00	0.0

Appendix 6.3-4 Load and Installed Capacity of Distribution Substations (JICA Study Team Plan, Planning Year = 1997 - 2001)

No	ABB	Substation	Voltage (KV)	2000				2001						
				Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci. (MVA)	utilization factor (%)	Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci. (MVA)	utilization factor (%)	
			115-12	1 x (40)	40	23.75	30.78	77.0	x	x	0	0.00	0.0	
			115-24	1 x 60	60	30.51	39.55	65.9	x	2 x 60	120	55.89	72.31	60.3
107	NG	Suvarahong	115-24	1 x 60	60	24.30	31.50	52.5	x	1 x 60	60	25.02	32.37	54.0
108	OB	South Bangkok	115-24	2 x 60	120	52.61	68.19	56.8	x	2 x 60	120	59.31	76.77	64.0
109	SE	Sriestam	115-24	2 x 60	120	67.06	86.92	72.1	x	3 x 60	180	85.68	110.85	61.6
110	SC	Suanluang	69-24	x	0	0.00	0.00	0.0	x	x	0	0.00	0.0	
			115-24	3 x 60	180	88.81	88.94	49.4	x	3 x 60	180	56.47	73.05	40.6
111	UK	Surasak	69-12	2 x (40)	80	23.88	30.95	38.7	x	2 x 60	120	31.90	45.15	37.6
			69-24	x	0	0.00	0.00	0.0	x	2 x 60	120	62.39	80.72	67.3
112	TY	Taibun	115-24	2 x 60	120	65.13	84.42	70.4	x	2 x 60	120	61.26	79.26	66.1
113	TV	Taveccatiana	115-24	2 x 60	120	51.47	70.60	58.8	x	2 x 60	120	61.26	79.26	66.1
114	TV	Theaburira	69-12	2 x (40)	80	41.82	51.21	67.8	x	2 x (40)	80	43.08	55.71	69.7
			115-24	x	0	0.00	0.00	0.0	x	x	0	0.00	0.0	
115	TH	Tungsonghong	69-24	x	0	0.00	0.00	0.0	x	x	0	0.00	0.0	
			115-24	2 x 60	120	43.44	56.31	46.9	x	2 x 60	120	41.26	53.38	44.5
116	YK	Yenarkat	69-12	2 x (40)	80	44.31	57.44	71.6	x	2 x 60	120	41.81	57.98	48.3
			69-24	x	0	0.00	0.00	0.0	x	2 x 60	120	43.07	55.72	46.1
117	AR	Bangbor	115-24	2 x 60	120	41.81	54.19	45.2	x	2 x 60	120	43.07	55.72	46.1
118	JK	Bangkok	69-12	x	0	0.00	0.00	0.0	x	x	0	0.00	0.0	
			115-12	1 x (40)	40	17.73	22.98	57.5	x	1 x (40)	40	13.02	16.85	42.1
			115-24	1 x 60	60	18.60	24.11	40.2	x	1 x 60	60	19.16	24.79	41.3
119	LD	Bangkradec	69-12	x	0	0.00	0.00	0.0	x	x	0	0.00	0.0	
			115-24	2 x 60	120	27.72	35.93	29.9	x	2 x 60	120	35.28	45.61	38.0
120	BL	Bungshan	115-24	2 x 60	120	36.68	47.54	39.6	x	2 x 60	120	37.78	48.88	40.7
121	RI	Bunsei	69-24	x	0	0.00	0.00	0.0	x	2 x 60	120	28.39	36.73	30.6
122	DD	Dindaeng	69-12	x	0	0.00	0.00	0.0	x	x	0	0.00	0.0	
			115-12	2 x (40)	80	40.20	52.11	65.1	x	2 x (40)	80	45.40	58.74	73.4
			115-24	x	0	0.00	0.00	0.0	x	x	0	0.00	0.0	
123	BC	Bachai	69-12	x	0	0.00	0.00	0.0	x	x	0	0.00	0.0	
			115-24	1 x 60	60	17.00	22.04	36.7	x	2 x 60	120	21.35	31.50	26.3
124	GA	Choakiang	69-24	2 x 60	120	35.39	45.87	38.2	x	2 x 60	120	48.45	62.68	52.2
			115-24	x	0	0.00	0.00	0.0	x	x	0	0.00	0.0	
125	JF	Jangsalana	115-24	2 x 60	120	61.67	79.93	66.6	x	2 x 60	120	59.52	77.01	61.2
126	JJ	Jaijuw	69-12	2 x (40)	80	38.29	49.63	62.0	x	x	0	0.00	0.0	
			69-24	x	0	0.00	0.00	0.0	x	2 x 60	120	23.16	29.96	25.0
			115-24	x	0	0.00	0.00	0.0	x	x	0	0.00	0.0	
127	KE	Kaset	69-12	x	0	0.00	0.00	0.0	x	x	0	0.00	0.0	
			69-24	2 x 60	120	50.14	64.99	54.2	x	2 x 60	120	51.65	66.82	55.7
128	KG	Klongkum	115-24	2 x 60	120	45.78	59.34	49.5	x	2 x 60	120	47.15	61.00	50.8
129	KL	Klongpratep	115-24	1 x 60	60	19.71	25.55	42.6	x	2 x 60	120	32.30	41.79	34.8
130	NU	Nirudom	69-12	1 x 40	40	13.46	17.45	43.6	x	1 x 40	40	21.53	27.85	64.6
			69-24	x	0	0.00	0.00	0.0	x	x	0	0.00	0.0	
131	RI	Ruangthong 4	115-24	2 x 60	120	55.82	72.35	60.3	x	2 x 60	120	59.50	76.98	64.2
132	MS	Ruangthong 5	115-24	2 x 60	120	61.95	79.52	66.3	x	2 x 60	120	59.19	76.58	63.8
133	NS	Ruangthong 6	115-24	2 x 60	120	60.72	78.70	65.6	x	2 x 60	120	59.51	77.03	64.2
134	NT	Ruangthong 7	115-24	x	0	0.00	0.00	0.0	x	2 x 60	120	63.01	81.52	67.9
135	NL	Nanglerng	69-12	x	0	0.00	0.00	0.0	x	2 x 40	80	14.19	17.17	71.5
136	TA	Patankarn	115-24	1 x 60	60	18.25	23.66	39.1	x	2 x 60	120	31.80	45.02	37.5
137	PL	Phubpa	115-24	x	0	0.00	0.00	0.0	x	2 x 60	120	42.70	55.25	46.0

No.	ABB	Substation	Voltage (KV)	1996				1997						
				Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	
138	PE	Praves	115-21	X	0	0	0.00	0.00	X	0	0	0.00	0.00	0.0
139	RP	Prompong	115-21	X	0	0	0.00	0.00	X	0	0	0.00	0.00	0.0
140	SI	Sainoi	115-21	X	0	0	0.00	0.00	X	0	0	0.00	0.00	0.0
141	YN	Suayarn	115-12	X	0	0	0.00	0.00	1 X (40)	40	23.88	30.99	77.3	77.3
142	SI	Satorn	115-21	X	0	0	0.00	0.00	X	0	0	0.00	0.00	0.0
143	JP	Shampoc	115-21	X	0	0	0.00	0.00	X	0	0	0.00	0.00	0.0
144	ST	Srisiang	69-12	X	0	0	0.00	0.00	X	0	0	0.00	0.00	0.0
145	YI	Suanvai	69-21	X	0	0	0.00	0.00	X	0	0	0.00	0.00	0.0
146	WT	Surintawong	115-21	X	0	0	0.00	0.00	X	0	0	0.00	0.00	0.0
147	TI	Tha-Khian	69-12	X	0	0	0.00	0.00	X	0	0	0.00	0.00	0.0
148	TC	Troakchan	69-21	X	0	0	0.00	0.00	1 X (40)	40	21.80	28.30	70.7	70.7
149	TV	Tubiao	115-21	X	0	0	0.00	0.00	X	0	0	0.00	0.00	0.0
150	TK	Takpaung	99-12	X	0	0	0.00	0.00	X	0	0	0.00	0.00	0.0
151	TK	Tuttakart	69-21	X	0	0	0.00	0.00	X	0	0	0.00	0.00	0.0
152	AK	Asoke	69-12	X	0	0	0.00	0.00	X	0	0	0.00	0.00	0.0
153	BT	Bangbuatong	115-21	X	0	0	0.00	0.00	X	0	0	0.00	0.00	0.0
154	RS	Banghuasac	115-21	X	0	0	0.00	0.00	X	0	0	0.00	0.00	0.0
155	BP	Bangbeac	115-21	X	0	0	0.00	0.00	X	0	0	0.00	0.00	0.0
156	PV	Banglecva	115-21	X	0	0	0.00	0.00	X	0	0	0.00	0.00	0.0
157	TD	Bangzard	115-21	X	0	0	0.00	0.00	X	0	0	0.00	0.00	0.0
158	JB	Jorababo	115-21	X	0	0	0.00	0.00	X	0	0	0.00	0.00	0.0
159	AB	Klongkampi	115-21	X	0	0	0.00	0.00	X	0	0	0.00	0.00	0.0
160	LA	Lomga	115-21	X	0	0	0.00	0.00	X	0	0	0.00	0.00	0.0
161	CP	Klongpaue	115-21	X	0	0	0.00	0.00	X	0	0	0.00	0.00	0.0
162	KR	Krungkrocta	115-21	X	0	0	0.00	0.00	X	0	0	0.00	0.00	0.0
163	LI	Lind & Jhuac	115-21	X	0	0	0.00	0.00	X	0	0	0.00	0.00	0.0
164	KB	Kuangthong 8	115-21	X	0	0	0.00	0.00	X	0	0	0.00	0.00	0.0
165	AP	Kuangthong 9	115-21	X	0	0	0.00	0.00	X	0	0	0.00	0.00	0.0
166	RL	Prankao	115-21	X	0	0	0.00	0.00	X	0	0	0.00	0.00	0.0
167	RJ	Rajachararop	115-21	X	0	0	0.00	0.00	X	0	0	0.00	0.00	0.0
168	NP	Sampao	115-21	X	0	0	0.00	0.00	X	0	0	0.00	0.00	0.0
169	DM	Suanikam	115-21	X	0	0	0.00	0.00	X	0	0	0.00	0.00	0.0
170	OS	Songsuntham	115-21	X	0	0	0.00	0.00	X	0	0	0.00	0.00	0.0
171	IK	Sriakarin	115-21	X	0	0	0.00	0.00	X	0	0	0.00	0.00	0.0
172	LO	Thonglor	115-21	X	0	0	0.00	0.00	X	0	0	0.00	0.00	0.0
173	TU	Tungku	115-21	X	0	0	0.00	0.00	X	0	0	0.00	0.00	0.0
174	ND	Katdetod	69-21	X	0	0	0.00	0.00	X	0	0	0.00	0.00	0.0
175	EY	Bangkruay	115-21	X	0	0	0.00	0.00	X	0	0	0.00	0.00	0.0
176	GC	Bangpaeng	115-21	X	0	0	0.00	0.00	X	0	0	0.00	0.00	0.0
177	AA	Bangpla	115-21	X	0	0	0.00	0.00	X	0	0	0.00	0.00	0.0
178	LD	Khongdan	115-21	X	0	0	0.00	0.00	X	0	0	0.00	0.00	0.0
179	ET	Khongratana	115-21	X	0	0	0.00	0.00	X	0	0	0.00	0.00	0.0
180	LF	Luangpung	115-21	X	0	0	0.00	0.00	X	0	0	0.00	0.00	0.0

Appendix 6.3-4 Load and Installed Capacity of Distribution Substations (JICA Study Team Plan. Planning Year = 1997 - 2001)

No.	Substation	Voltage (KV)	1998				1999					
			Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)
138	PM	115-24	X	0	0.00	0.00	0.0	X	0	0.00	0.00	0.0
139	PP	115-24	X	0	0.00	0.00	0.0	X	0	0.00	0.00	0.0
140	SI	115-24	X	0	0.00	0.00	0.0	X	0	0.00	0.00	0.0
141	SN	115-12	2 X (40)	80	37.35	48.44	60.6	2 X (40)	80	44.79	58.01	72.6
142	SO	115-24	X	0	0.00	0.00	0.0	X	0	0.00	0.00	0.0
143	SP	115-24	1 X 60	60	23.81	30.91	51.5	1 X 60	60	22.88	29.65	49.4
144	SR	69-12	X	0	0.00	0.00	0.0	2 X (40)	80	23.00	29.80	37.3
145	SI	115-24	X	0	0.00	0.00	0.0	X	0	0.00	0.00	0.0
146	ST	115-24	X	0	0.00	0.00	0.0	X	0	0.00	0.00	0.0
147	TA	69-12	X	0	0.00	0.00	0.0	2 X (40)	80	36.71	47.57	59.5
148	TC	115-12	2 X (40)	80	41.24	53.47	66.8	2 X (40)	80	41.32	57.13	71.8
149	TD	115-24	X	0	0.00	0.00	0.0	X	0	0.00	0.00	0.0
150	TE	69-12	1 X 40	40	16.32	21.16	32.9	1 X 40	40	20.97	27.17	67.9
151	TF	69-24	X	0	0.00	0.00	0.0	X	0	0.00	0.00	0.0
152	AG	115-24	X	0	0.00	0.00	0.0	X	0	0.00	0.00	0.0
153	BT	115-24	X	0	0.00	0.00	0.0	X	0	0.00	0.00	0.0
154	BS	115-24	X	0	0.00	0.00	0.0	X	0	0.00	0.00	0.0
155	BV	115-24	X	0	0.00	0.00	0.0	X	0	0.00	0.00	0.0
156	PV	115-24	X	0	0.00	0.00	0.0	X	0	0.00	0.00	0.0
157	TD	115-24	X	0	0.00	0.00	0.0	X	0	0.00	0.00	0.0
158	JB	115-24	X	0	0.00	0.00	0.0	X	0	0.00	0.00	0.0
159	KB	115-24	X	0	0.00	0.00	0.0	X	0	0.00	0.00	0.0
160	LA	115-24	X	0	0.00	0.00	0.0	X	0	0.00	0.00	0.0
161	GP	115-24	X	0	0.00	0.00	0.0	X	0	0.00	0.00	0.0
162	KK	115-24	X	0	0.00	0.00	0.0	X	0	0.00	0.00	0.0
163	LJ	115-24	X	0	0.00	0.00	0.0	X	0	0.00	0.00	0.0
164	H6	115-24	X	0	0.00	0.00	0.0	X	0	0.00	0.00	0.0
165	H9	115-24	X	0	0.00	0.00	0.0	X	0	0.00	0.00	0.0
166	RL	115-24	X	0	0.00	0.00	0.0	X	0	0.00	0.00	0.0
167	RJ	115-24	X	0	0.00	0.00	0.0	X	0	0.00	0.00	0.0
168	NP	115-24	X	0	0.00	0.00	0.0	X	0	0.00	0.00	0.0
169	OK	115-24	X	0	0.00	0.00	0.0	X	0	0.00	0.00	0.0
170	OS	115-24	X	0	0.00	0.00	0.0	X	0	0.00	0.00	0.0
171	IK	115-24	X	0	0.00	0.00	0.0	X	0	0.00	0.00	0.0
172	LD	115-24	X	0	0.00	0.00	0.0	X	0	0.00	0.00	0.0
173	TU	115-24	X	0	0.00	0.00	0.0	X	0	0.00	0.00	0.0
174	MD	69-24	X	0	0.00	0.00	0.0	X	0	0.00	0.00	0.0
175	CV	115-24	X	0	0.00	0.00	0.0	X	0	0.00	0.00	0.0
176	GC	115-24	X	0	0.00	0.00	0.0	X	0	0.00	0.00	0.0
177	AA	115-24	X	0	0.00	0.00	0.0	X	0	0.00	0.00	0.0
178	LD	115-24	X	0	0.00	0.00	0.0	X	0	0.00	0.00	0.0
179	GT	115-24	X	0	0.00	0.00	0.0	X	0	0.00	0.00	0.0
180	LG	115-24	X	0	0.00	0.00	0.0	X	0	0.00	0.00	0.0

Appendix 6.3-4 Load and Installed Capacity of Distribution Substations (JICA Study Team Plan, Planning Year = 1997 - 2001)

(18/21)

No	ABB	Substation	Voltage (KV)	2000				2001				
				Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)
138	PT	Praves	115-24	2 x 60	120	32.63	42.29	35.3	120	13.61	56.12	47.0
139	RP	Prompong	115-24	2 x 60	120	48.04	62.27	51.9	120	35.75	16.25	38.5
140	SI	Suinoi	115-24	2 x 60	120	0.00	0.00	0.0	120	22.36	28.93	24.1
141	YN	Suavarn	115-12	2 x (40)	80	41.57	53.88	67.4	80	42.50	51.99	68.7
142	SI	Suavarn	115-24	2 x 60	120	0.00	0.00	0.0	120	53.35	69.02	57.5
143	RP	Shimjee	115-24	2 x 60	120	48.92	63.11	52.8	120	55.51	71.86	58.9
144	SN	Sriwong	69-12	2 x (40)	80	44.70	57.91	72.4	80	34.88	45.13	56.4
145	YI	Suavoi	115-24	2 x 60	120	0.00	0.00	0.0	120	21.36	27.64	23.0
146	WT	Suwinatong	115-24	2 x 60	120	14.00	18.15	15.1	120	16.36	21.17	17.6
147	TI	Tha-khian	69-12	2 x (40)	80	37.81	49.01	61.3	80	38.95	50.39	63.0
148	TC	Trokhuan	115-12	2 x (40)	80	43.31	56.14	70.2	80	34.72	44.92	56.2
149	TI	Tubvan	115-24	1 x 60	60	20.00	25.92	43.2	120	30.36	39.28	32.7
150	FK	Wattampong	69-12	1 x 40	40	21.60	28.00	70.0	120	31.25	41.31	36.9
151	PK	Wutakart	69-12	1 x (40)	40	17.00	22.04	55.1	120	33.32	43.11	35.9
152	AK	Asoke	115-24	2 x 60	120	0.00	0.00	0.0	120	0.00	0.00	0.0
153	BT	Bangbuatong	115-24	2 x 60	120	0.00	0.00	0.0	120	0.00	0.00	0.0
154	BS	Bangbusae	115-24	2 x 60	120	0.00	0.00	0.0	120	0.00	0.00	0.0
155	BT	Bangtaew	115-24	2 x 60	120	0.00	0.00	0.0	120	0.00	0.00	0.0
156	PT	Bangpleevai	115-24	2 x 60	120	0.00	0.00	0.0	120	0.00	0.00	0.0
157	TD	Banglalarid	115-24	2 x 60	120	0.00	0.00	0.0	120	0.00	0.00	0.0
158	JB	Jorababoo	115-24	2 x 60	120	0.00	0.00	0.0	120	0.00	0.00	0.0
159	KB	Klongbangpi	115-24	2 x 60	120	0.00	0.00	0.0	120	0.00	0.00	0.0
160	EA	Klongpa	115-24	2 x 60	120	0.00	0.00	0.0	120	0.00	0.00	0.0
161	CP	Klongpue	115-24	2 x 60	120	0.00	0.00	0.0	120	0.00	0.00	0.0
162	KR	Krongtakraeta	115-24	2 x 60	120	0.00	0.00	0.0	120	0.00	0.00	0.0
163	LM	Land & House	115-24	2 x 60	120	0.00	0.00	0.0	120	0.00	0.00	0.0
164	NS	Nuangthong 8	115-24	2 x 60	120	0.00	0.00	0.0	120	0.00	0.00	0.0
165	N9	Nuangthong 9	115-24	2 x 60	120	0.00	0.00	0.0	120	0.00	0.00	0.0
166	RL	Praramkan	115-24	2 x 60	120	0.00	0.00	0.0	120	0.00	0.00	0.0
167	EJ	Rajchaprurup	115-24	2 x 60	120	0.00	0.00	0.0	120	0.00	0.00	0.0
168	NP	Sarapaoo	115-24	2 x 60	120	0.00	0.00	0.0	120	0.00	0.00	0.0
169	OW	Savanikow	115-24	2 x 60	120	0.00	0.00	0.0	120	0.00	0.00	0.0
170	OS	Songsunikom	115-24	2 x 60	120	0.00	0.00	0.0	120	0.00	0.00	0.0
171	IK	Srinakarim	115-24	2 x 60	120	0.00	0.00	0.0	120	0.00	0.00	0.0
172	LO	Thonglor	115-24	2 x 60	120	0.00	0.00	0.0	120	0.00	0.00	0.0
173	TU	Tungkra	115-24	2 x 60	120	0.00	0.00	0.0	120	0.00	0.00	0.0
174	WD	Waldedod	69-24	2 x 60	120	0.00	0.00	0.0	120	0.00	0.00	0.0
175	GT	Bangkruey	115-24	2 x 60	120	0.00	0.00	0.0	120	0.00	0.00	0.0
176	GC	Bungang	115-24	2 x 60	120	0.00	0.00	0.0	120	0.00	0.00	0.0
177	AK	Bungpla	115-24	2 x 60	120	0.00	0.00	0.0	120	0.00	0.00	0.0
178	LD	Klongdan	115-24	2 x 60	120	0.00	0.00	0.0	120	0.00	0.00	0.0
179	GT	Klongkattiam	115-24	2 x 60	120	0.00	0.00	0.0	120	0.00	0.00	0.0
180	LG	Luangpaeng	115-24	2 x 60	120	0.00	0.00	0.0	120	0.00	0.00	0.0

Appendix 6.3-4 Load and Installed Capacity of Distribution Substations (JICA Study Team Plan. Planning Year = 1997 - 2001)

No	ABB	Substation	Voltage (KV)	1996				1997					
				Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)
181	LS	Luangphasie	115-21	X	0	0.00	0.00	0.00	X	0	0.00	0.00	0.00
182	NI	Nimitteai	115-21	X	0	0.00	0.00	0.00	X	0	0.00	0.00	0.00
183	NY	Nongruai	115-21	X	0	0.00	0.00	0.00	X	0	0.00	0.00	0.00
184	IL	Pinkiso	115-21	X	0	0.00	0.00	0.00	X	0	0.00	0.00	0.00
185	PH	Pongpetch	115-21	X	0	0.00	0.00	0.00	X	0	0.00	0.00	0.00
186	PT	Puttamonthon	115-21	X	0	0.00	0.00	0.00	X	0	0.00	0.00	0.00
187	RO	Rajchakru	115-21	X	0	0.00	0.00	0.00	X	0	0.00	0.00	0.00
188	RR	Rajdarut	115-21	X	0	0.00	0.00	0.00	X	0	0.00	0.00	0.00
189	AT	Satornatai	115-21	X	0	0.00	0.00	0.00	X	0	0.00	0.00	0.00
190	TL	Talingchan	115-21	X	0	0.00	0.00	0.00	X	0	0.00	0.00	0.00
191	TN	Tiarsuamit	115-21	X	0	0.00	0.00	0.00	X	0	0.00	0.00	0.00
192	RW	Trimit	69-12	X	0	0.00	0.00	0.00	X	0	0.00	0.00	0.00
Total					11.645	5,267.77	6,856.23	58.9		12.825	5,715.69	7,156.16	58.1

Diversity Factor 1.1805
 Power Factor 0.9070

Number of Bank a 257
 Number of Substation b 124
 Ratio a/b 2.0726

1.1809
 0.9100

277
 130
 2.1308

Appendix 6.3-4 Load and Installed Capacity of Distribution Substations (JICA Study Team Plan, Planning Year = 1997 - 2001)

No	ABB	Substation	Voltage (KV)	1998				1999						
				Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	
181	LS	Lumpashe	115-24	X	0	0.00	0.00	0.00	0.00	X	0	0.00	0.00	0.00
182	NI	Ninime	115-24	X	0	0.00	0.00	0.00	0.00	X	0	0.00	0.00	0.00
183	NY	Nongyai	115-24	X	0	0.00	0.00	0.00	0.00	X	0	0.00	0.00	0.00
184	IL	Pinklao	115-24	X	0	0.00	0.00	0.00	0.00	X	0	0.00	0.00	0.00
185	PH	Pongpetch	115-24	X	0	0.00	0.00	0.00	0.00	X	0	0.00	0.00	0.00
186	PT	PuLamonton	115-24	X	0	0.00	0.00	0.00	0.00	X	0	0.00	0.00	0.00
187	RO	Rajchakru	115-24	X	0	0.00	0.00	0.00	0.00	X	0	0.00	0.00	0.00
188	RR	Rajdamri	115-24	X	0	0.00	0.00	0.00	0.00	X	0	0.00	0.00	0.00
189	AT	Satormtai	115-24	X	0	0.00	0.00	0.00	0.00	X	0	0.00	0.00	0.00
190	TL	Talingchan	115-24	X	0	0.00	0.00	0.00	0.00	X	0	0.00	0.00	0.00
191	TA	Tiamtuumail	115-24	X	0	0.00	0.00	0.00	0.00	X	0	0.00	0.00	0.00
192	RM	Trimit	69-12	X	0	0.00	0.00	0.00	0.00	X	0	0.00	0.00	0.00
Total					13,585	6,171.46	8,002.55	58.9		14,125	6,626.59	8,566.21	56.5	

Diversity Factor 1.1813
Power Factor 0.9110

1.1817
0.9120

Number of Bank a 289
Number of Substation b 135
Ratio a/b 2.1407

302
139
2.1727

Appendix 6.3-4 Load and Installed Capacity of Distribution Substations (JICA Study Team Plan, Planning Year = 1997 - 2001)

No.	ABB	Substation	Voltage (KV)	2000				2001						
				Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	Bank configuration	Capacity (MVA)	coincident (MW)	non-coinci (MVA)	utilization factor (%)	
181	LS	Lumpashe	115-24	X	0	0.00	0.00	0.00	0.00	X	0	0.00	0.00	0.00
182	NI	Mimitai	115-24	X	0	0.00	0.00	0.00	0.00	X	0	0.00	0.00	0.00
183	NY	Nongyai	115-24	X	0	0.00	0.00	0.00	0.00	X	0	0.00	0.00	0.00
184	IL	Pinkiao	115-24	X	0	0.00	0.00	0.00	0.00	X	0	0.00	0.00	0.00
185	PH	Pongpetch	115-24	X	0	0.00	0.00	0.00	0.00	X	0	0.00	0.00	0.00
186	PT	Puttamonton	115-24	X	0	0.00	0.00	0.00	0.00	X	0	0.00	0.00	0.00
187	RO	Rajchakru	115-24	X	0	0.00	0.00	0.00	0.00	X	0	0.00	0.00	0.00
188	RR	Rajdamri	115-24	X	0	0.00	0.00	0.00	0.00	X	0	0.00	0.00	0.00
189	AT	Satorntai	115-24	X	0	0.00	0.00	0.00	0.00	X	0	0.00	0.00	0.00
190	TL	Talingchar	115-24	X	0	0.00	0.00	0.00	0.00	X	0	0.00	0.00	0.00
191	TM	Tianruamit	115-24	X	0	0.00	0.00	0.00	0.00	X	0	0.00	0.00	0.00
192	RV	Trinit	69-12	X	0	0.00	0.00	0.00	0.00	X	0	0.00	0.00	0.00
Total					15.405	7.131.03	9.243.01	60.0		17.345	7.864.89	9.916.35	56.5	

Diversity Factor
Power Factor

1.1821
0.9120

1.1825
0.9140

Number of Bank a
Number of Substation b
Ratio a/b

318
144
2.2083

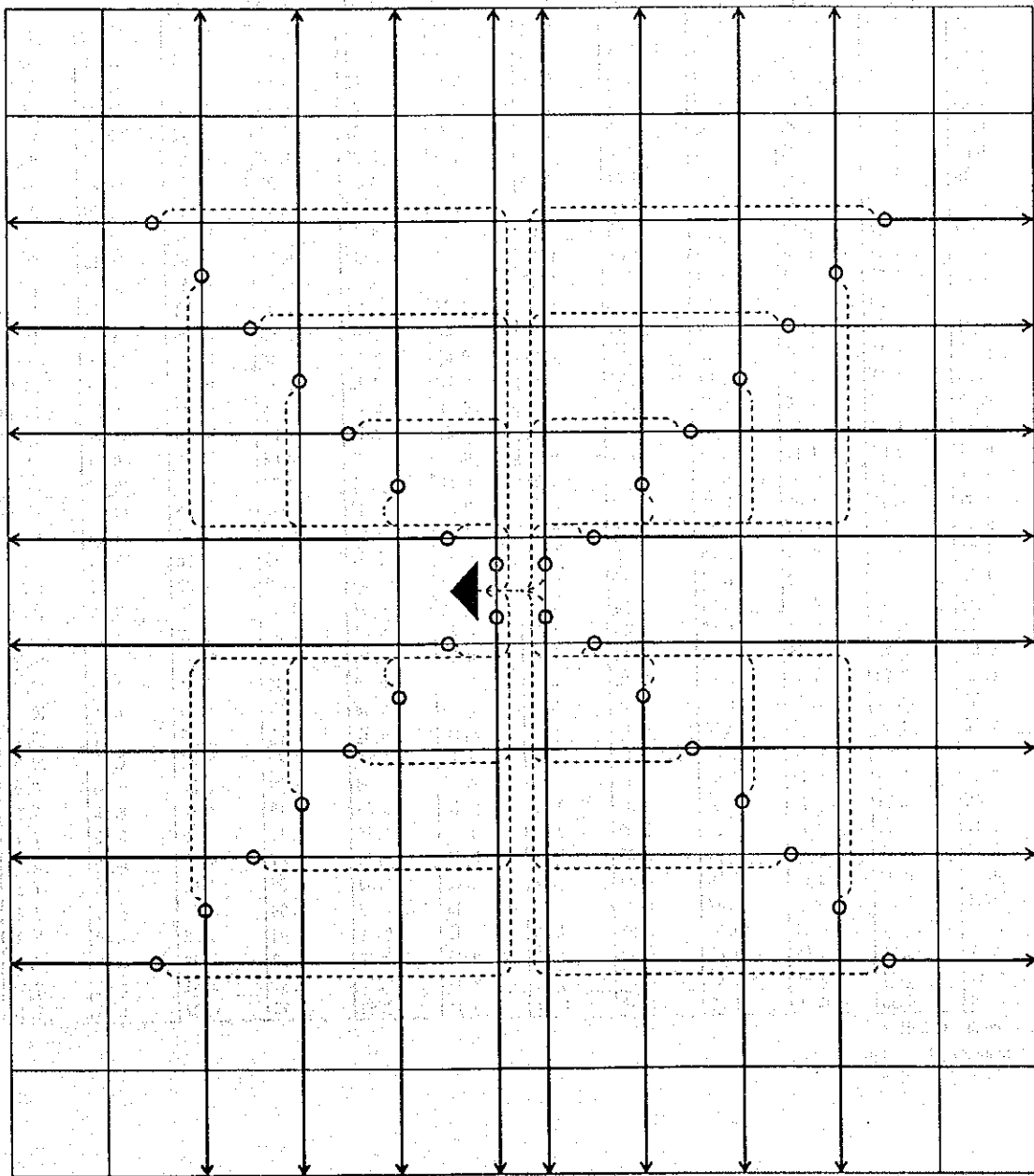
341
151
2.2583

APPENDIX

for

CHAPTER 9

Appendix 9.3-1



Model of Feeder Rising Point (In case of 200m mesh)

No of Feeder	Length of UG Cable
1	75 m
2	150 m
3	275 m
4	400 m
5	525 m
6	850 m
7	1,125 m
8	1,400 m
9	1,825 m
10	2,250 m
11	2,725 m
12	3,200 m
13	3,825 m
14	4,450 m
15	5,125 m
16	5,800 m
17	6,625 m
18	7,450 m
19	8,325 m
20	9,200 m
21	10,225 m
22	11,250 m
23	12,325 m
24	13,400 m
25	14,625 m
26	15,850 m
27	17,125 m
28	18,400 m
29	19,825 m
30	21,250 m
31	22,725 m
32	24,200 m

Supply Area of Substation (In case of 200m mesh)

Density (MVA/sq. km)	Supply Area (sq. km)				Supply Reach (km)				Total Feeder Length (km)			
	3×40	4×40	3×60	3×80	3×40	4×40	3×60	3×80	3×40	4×40	3×60	3×80
1	96.00	128.00	144.00	192.00	5.53	6.38	6.77	7.82	940.60	1,267.14	1,416.00	1,912.18
2	48.00	64.00	72.00	96.00	3.91	4.51	4.79	5.53	471.12	624.00	712.76	940.60
3	32.00	42.67	48.00	64.00	3.19	3.69	3.91	4.51	316.78	418.06	471.12	624.00
4	24.00	32.00	36.00	48.00	2.76	3.19	3.39	3.91	235.15	316.78	348.00	471.12
5	19.20	25.60	28.80	38.40	2.47	2.85	3.03	3.50	184.03	252.98	279.06	371.81
6	16.00	21.33	24.00	32.00	2.26	2.61	2.76	3.19	152.00	212.45	235.15	316.78
7	13.71	18.29	20.57	27.43	2.09	2.41	2.56	2.95	133.30	179.62	199.56	272.34
8	12.00	16.00	18.00	24.00	1.95	2.26	2.39	2.76	117.78	152.00	178.19	235.15
9	10.67	14.22	16.00	21.33	1.84	2.13	2.26	2.61	104.53	135.75	152.00	212.45
10	9.60	12.80	14.40	19.20	1.75	2.02	2.14	2.47	92.95	121.64	136.61	184.03
15	6.40	8.53	9.60	12.80	1.43	1.65	1.75	2.02	60.72	81.78	92.95	121.64
20	4.80	6.40	7.20	9.60	1.24	1.43	1.51	1.75	43.82	60.72	69.77	92.95
25	3.84	5.12	5.76	7.68	1.11	1.28	1.35	1.56	35.27	49.78	52.80	72.05
30	3.20	4.27	4.80	6.40	1.01	1.17	1.24	1.43	28.62	41.33	43.82	60.72
35	2.74	3.66	4.11	5.49	0.93	1.08	1.14	1.32	26.48	34.44	40.55	51.55
40	2.40	3.20	3.60	4.80	0.87	1.01	1.07	1.24	21.69	28.62	34.15	43.82
45	2.13	2.84	3.20	4.27	0.82	0.95	1.01	1.17	20.43	26.96	28.62	41.33
50	1.92	2.56	2.88	3.84	0.78	0.90	0.96	1.11	16.63	22.40	27.15	35.27
55	1.75	2.33	2.62	3.49	0.75	0.86	0.91	1.05	15.87	21.37	25.90	33.63
60	1.60	2.13	2.40	3.20	0.71	0.82	0.87	1.01	15.18	20.43	21.69	28.62
65	1.48	1.97	2.22	2.95	0.69	0.79	0.84	0.97	14.60	19.65	20.86	27.48
70	1.37	1.83	2.06	2.74	0.66	0.76	0.81	0.93	11.70	16.23	20.09	26.48
75	1.28	1.71	1.92	2.56	0.64	0.74	0.78	0.90	11.31	15.69	16.63	22.40
80	1.20	1.60	1.80	2.40	0.62	0.71	0.76	0.87	10.95	15.18	16.10	21.69
85	1.13	1.51	1.69	2.26	0.60	0.69	0.73	0.85	10.63	14.75	15.60	21.05
90	1.07	1.42	1.60	2.13	0.58	0.67	0.71	0.82	10.34	11.92	15.18	20.43
95	1.01	1.35	1.52	2.02	0.57	0.65	0.69	0.80	10.05	11.62	14.79	19.90
100	0.96	1.28	1.44	1.92	0.55	0.64	0.68	0.78	7.84	11.31	12.00	16.63
105	0.91	1.22	1.37	1.83	0.54	0.62	0.66	0.76	7.63	11.05	11.70	16.23
110	0.87	1.16	1.31	1.75	0.53	0.61	0.65	0.75	7.46	10.77	11.45	15.87
115	0.83	1.11	1.25	1.67	0.52	0.60	0.63	0.73	7.29	10.54	11.18	15.51
120	0.80	1.07	1.20	1.60	0.50	0.58	0.62	0.71	7.16	10.34	10.95	15.18
125	0.77	1.02	1.15	1.54	0.49	0.57	0.61	0.70	7.02	10.10	10.72	14.89
130	0.74	0.98	1.11	1.48	0.48	0.56	0.59	0.69	6.88	7.92	10.54	14.60
135	0.71	0.95	1.07	1.42	0.48	0.55	0.58	0.67	6.74	7.80	10.34	11.92
140	0.69	0.91	1.03	1.37	0.47	0.54	0.57	0.66	6.65	7.63	10.15	11.70
145	0.66	0.88	0.99	1.32	0.46	0.53	0.56	0.65	6.50	7.50	7.96	11.49
150	0.64	0.85	0.96	1.28	0.45	0.52	0.55	0.64	4.80	7.38	7.84	11.31
155	0.62	0.83	0.93	1.24	0.44	0.51	0.54	0.63	4.72	7.29	7.71	11.14
160	0.60	0.80	0.90	1.20	0.44	0.50	0.54	0.62	4.65	7.16	7.59	10.95
165	0.58	0.78	0.87	1.16	0.43	0.50	0.53	0.61	4.57	7.07	7.46	10.77
170	0.56	0.75	0.85	1.13	0.42	0.49	0.52	0.60	4.49	6.93	7.38	10.63
175	0.55	0.73	0.82	1.10	0.42	0.48	0.51	0.59	4.45	6.84	7.24	10.49
180	0.53	0.71	0.80	1.07	0.41	0.48	0.50	0.58	4.37	6.74	7.16	10.34
185	0.52	0.69	0.78	1.04	0.41	0.47	0.50	0.57	4.33	6.65	7.07	10.20
190	0.51	0.67	0.76	1.01	0.40	0.46	0.49	0.57	4.28	6.55	6.97	10.05
195	0.49	0.66	0.74	0.98	0.40	0.46	0.48	0.56	4.20	6.50	6.88	7.92
200	0.48	0.64	0.72	0.96	0.39	0.45	0.48	0.55	4.16	4.80	6.79	7.84
205	0.47	0.62	0.70	0.94	0.39	0.45	0.47	0.55	4.11	4.72	6.69	7.76
210	0.46	0.61	0.69	0.91	0.38	0.44	0.47	0.54	4.07	4.69	6.65	7.63
215	0.45	0.60	0.67	0.89	0.38	0.44	0.46	0.53	4.02	4.65	6.55	7.55
220	0.44	0.58	0.65	0.87	0.37	0.43	0.46	0.53	3.98	4.57	6.45	7.46
225	0.43	0.57	0.64	0.85	0.37	0.43	0.45	0.52	3.93	4.53	4.80	7.38
230	0.42	0.56	0.63	0.83	0.36	0.42	0.45	0.52	3.89	4.49	4.76	7.29
235	0.41	0.54	0.61	0.82	0.36	0.42	0.44	0.51	3.84	4.41	4.69	7.24
240	0.40	0.53	0.60	0.80	0.36	0.41	0.44	0.50	3.79	4.37	4.65	7.16

Supply Reach : Length of Radius

Feeder Length : Road of 200m Mesh

Cost of Model Case (In case of 200m mesh)

Size of Conductor (sq.mm)	Bank Configuration	Capacity (MVA)	Maximum Loading (MVA)	Feeder Voltage (kV)	No. of Feeders (ckt)	WC Cable Length (m)	Overhead Length (km)	Unit Cost			Cost (Thousand Baht)			kVA Cost (Baht/kVA)	
								Feeder GIS (thousand Baht)	WC Cable (Baht/m)	Overhead (Baht/m)	Feeder GIS	WC Cable	Overhead		Total
185	3×40	120	96	12	3 × 5 = 15	5.125	10.95	8,700	3,960	2,880	18,640	20,300	31,540	734.2	
				24	3 × 3 = 9	1.825	10.95	12,500	4,240	3,060	16,070	7,740	33,510	57,320	597.1
				36	3 × 2 = 6	850	17,500	5,460	3,230	15,000	4,640	35,370	55,010	573.0	
	4×40	160	128	12	4 × 5 = 20	9,200	15.18	8,700	3,960	2,880	24,860	36,430	43,720	820.4	
				24	4 × 3 = 12	3,200	15.18	12,500	4,240	3,060	21,430	13,570	48,450	81,450	696.3
				36	4 × 2 = 8	1,400	15.18	17,500	5,460	3,230	20,000	7,640	49,030	76,670	599.0
	3×60	180	144	12	3 × 8 = 24	13,400	16.10	8,700	3,960	2,880	29,830	53,060	46,370	129,260	897.6
				24	3 × 4 = 12	3,200	16.10	12,500	4,240	3,060	21,430	13,570	49,270	84,270	585.2
				36	3 × 3 = 9	1,825	16.10	17,500	5,460	3,230	22,500	9,960	52,000	84,460	586.5
	3×80	240	192	12	3 × 10 = 30	21,250	21.69	8,700	3,960	2,880	37,290	84,150	62,470	183,910	957.9
				24	3 × 5 = 15	5,125	21.69	12,500	4,240	3,060	26,790	21,730	66,370	114,890	598.4
				36	3 × 4 = 12	3,200	21.69	17,500	5,460	3,230	30,000	17,470	70,060	117,530	612.1
240	3×40	120	96	12	3 × 4 = 12	3,200	10.95	8,700	3,960	2,920	14,910	12,670	31,970	59,550	620.3
				24	3 × 2 = 6	850	10.95	12,500	4,240	3,100	10,710	3,600	33,950	48,260	502.7
				36	3 × 2 = 6	850	10.95	17,500	5,460	3,270	15,000	4,640	35,810	55,450	577.6
	4×40	160	128	12	4 × 4 = 16	5,800	15.18	8,700	3,960	2,920	19,890	22,970	44,330	87,190	681.2
				24	4 × 2 = 8	1,400	15.18	12,500	4,240	3,100	14,290	5,940	47,060	67,290	525.7
				36	4 × 2 = 8	1,400	15.18	17,500	5,460	3,270	20,000	7,640	49,640	77,280	603.8
3×60	180	144	12	3 × 6 = 18	7,450	16.10	8,700	3,960	2,920	22,370	29,500	47,010	98,880	686.7	
			24	3 × 3 = 9	1,825	16.10	12,500	4,240	3,100	16,070	7,740	49,910	73,720	511.9	
			36	3 × 2 = 6	850	16.10	17,500	5,460	3,270	15,000	4,640	52,650	72,290	502.0	
3×80	240	192	12	3 × 8 = 24	13,400	21.69	8,700	3,960	2,920	29,830	53,060	63,330	146,220	761.6	
			24	3 × 4 = 12	3,200	21.69	12,500	4,240	3,100	21,430	13,570	67,240	102,240	532.5	
			36	3 × 3 = 9	1,825	21.69	17,500	5,460	3,270	22,500	9,960	70,930	103,390	538.5	

Appendix 9.3-2 Determining Transformer Capacity

変圧器容量の決定

まず負荷の最大需要電力を算定する。次に以下の計算によってネットワーク変圧器容量を決定する。

1回線停電時も負荷制限を行うことなく、健全回線の変圧器の過負荷使用により、負荷への給電を継続する必要がある。

$$\text{ネットワーク変圧器容量 (kVA)} = \frac{P}{N-1} \times \frac{100}{\alpha}$$

P : 最大需要電力 (kVA)

N : 受電回線数 (ckt)

α : 過負荷率 (%)

計算例

将来の負荷増加を考慮した最大需要電力 : 3,300 kVA

受電回線数 : 3 ckt

ネットワーク変圧器過負荷率 : 130 %

$$\text{ネットワーク変圧器容量} = \frac{3,300}{3-1} \times \frac{100}{130} = 1,270 \text{ kVA}$$

ネットワーク変圧器の標準定格を勘案して、

ネットワーク変圧器容量 = 1,500 kVAとする。

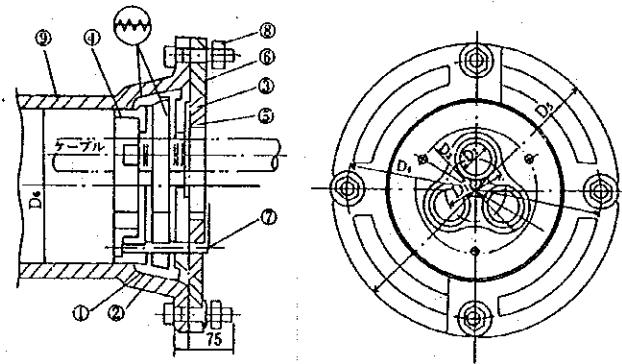
1. レギュラーネットワーク変圧器の浸水対策

レギュラーネットワーク変圧器は、マンホール全体が浸水することも予想されるため、水深5mの水圧に対し十分な水密性を保ち機器内部への浸水のない構造とする。

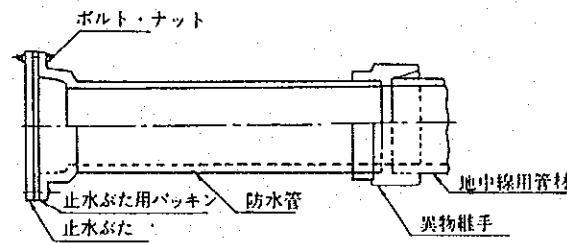
2. マンホールの防水対策

マンホールの防水対策として、管路部分からの浸水を防止するため、管路口防水装置ならびに止水ぶたを適用する。

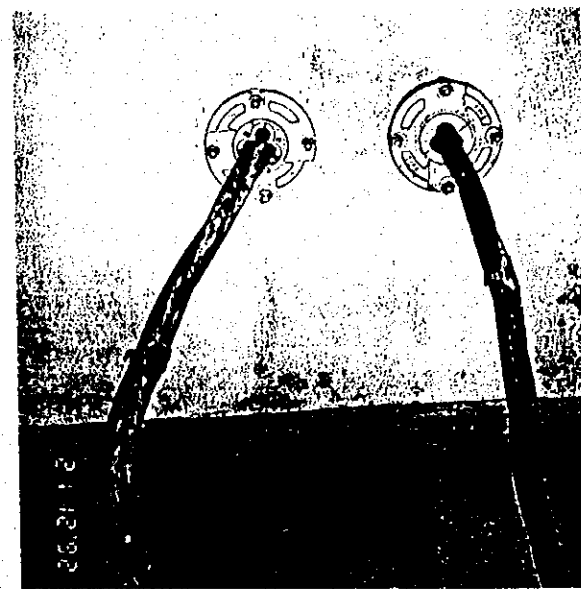
管路口防水装置



止水ぶた



番号	名称
①	パッキング
②	防水混和物
③	支持金具I
④	支持金具II
⑤	中心部金具
⑥	締付金具
⑦	支持ボルト
⑧	締付ボルト
⑨	防水铸铁管



管路口防水装置適用例

3. マンホールの排水対策

マンホール内の溜水を排水するため以下の設備を設置する。

(1) 水中ポンプ

容量 : 0.75 kW
 管径 : 50 mm
 揚水量 : 200 ℓ/min
 全揚程 : 10 m以上

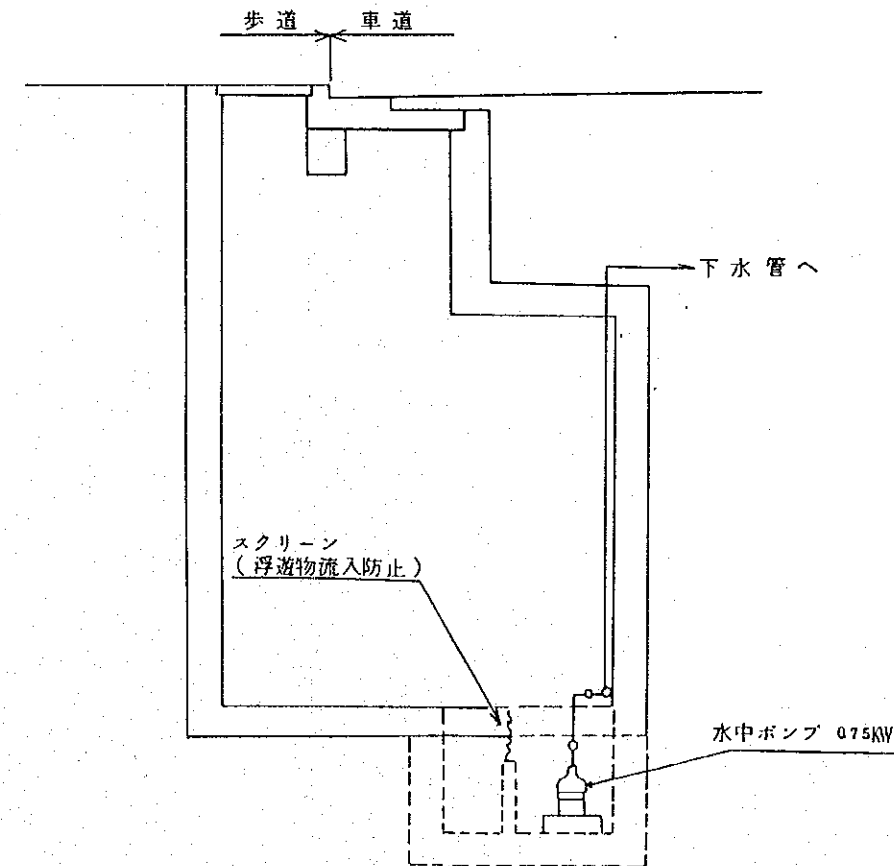
水中ポンプは、手動操作および水位継電器による自動運転とする。

(2) 排水枡

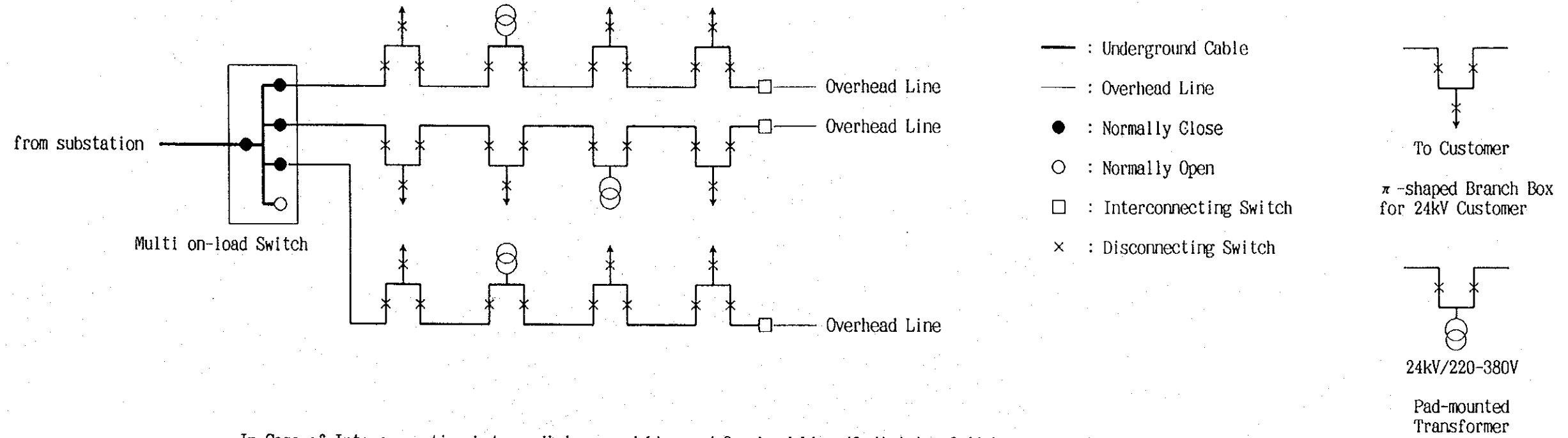
- ・溜水には、土砂等が多分に含まれているので、排水枡に浮遊物流入防止スクリーンを設置して、水のみを下水管へ放水する。
- ・排水枡容量は、0.2 m³以上とする。

(3) 排水管

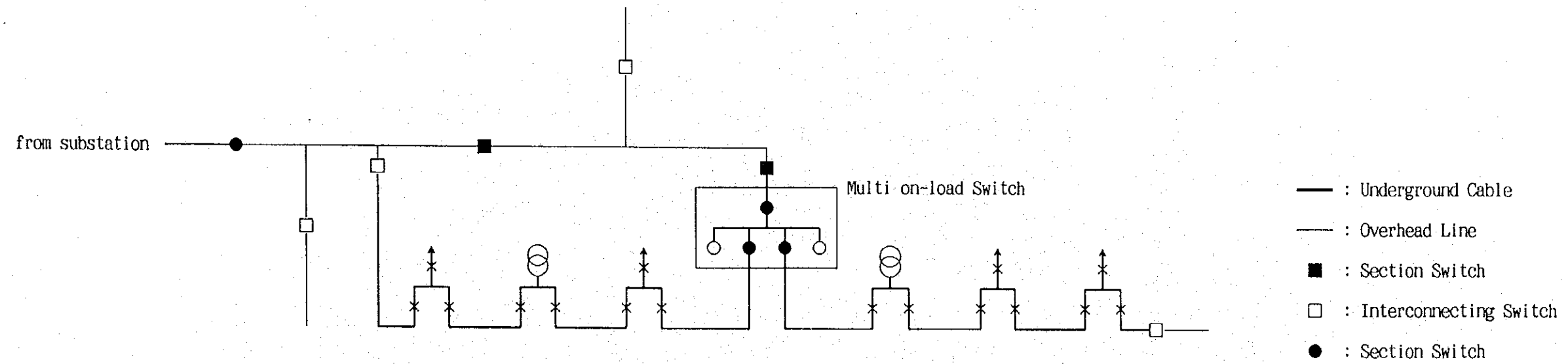
- ・排水管の管径は50mmとし、材質は腐食について考慮し決定する。



Appendix 9.3-3 Examples of Water-proofing Countermeasures in Regular Network System

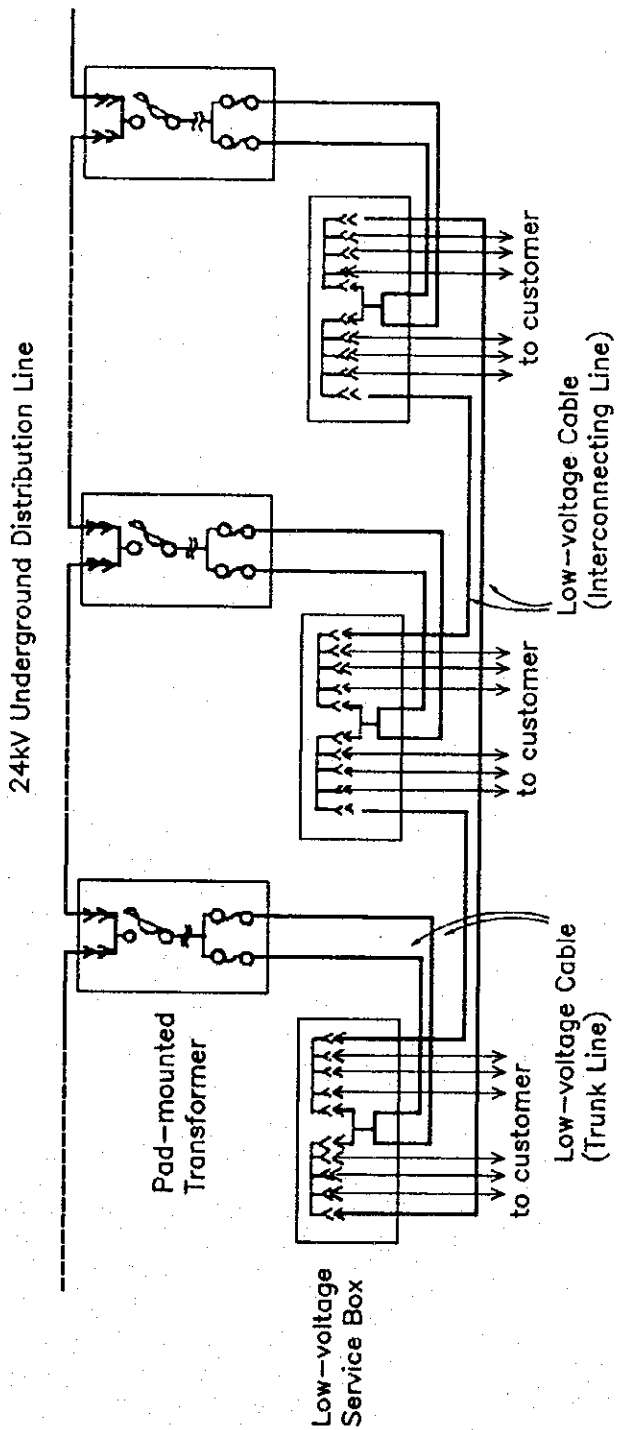


In Case of Interconnecting between Underground Line and Overhead Line (3-division 3-linkage system)

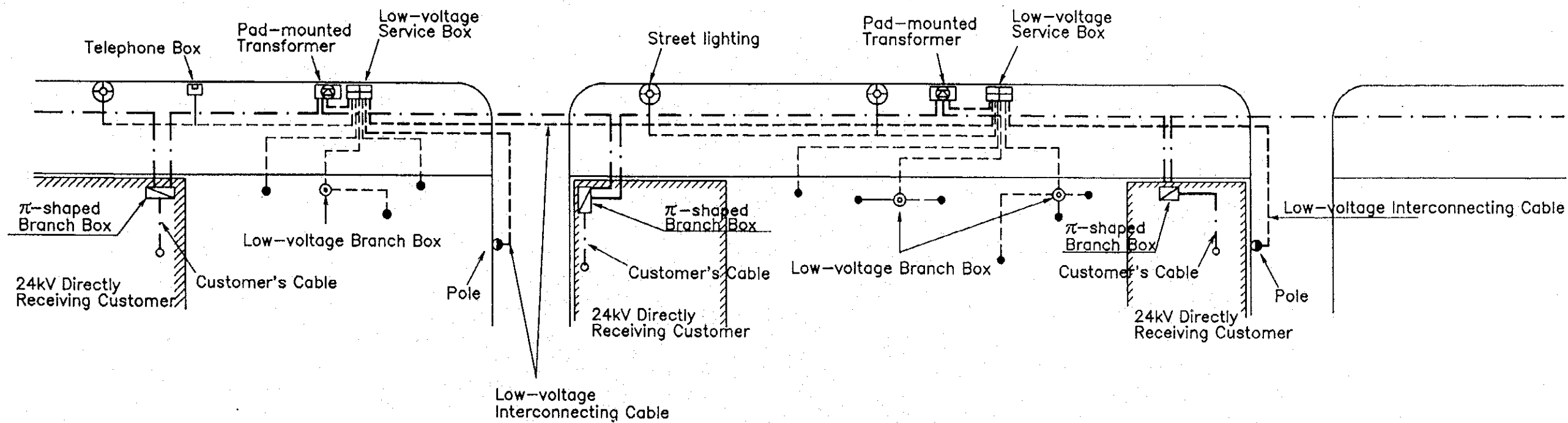


In Case of Mixture with Underground Line and Overhead Line (3-division 3-linkage system)

Appendix 9.3-4 Example of Basic Configuration as Mixture with Underground Line and Overhead Line



Appendix 9.3-5 Basic Configuration of Low-voltage Underground Distribution Line



— · — 24kV Underground Distribution Line
 - - - - Low-voltage Underground Distribution Line

Appendix 9.3-6 Basic Combination of Underground Distribution Facilities

Appendix 9.3-7 Time-delay Fault Detecting System

時限式事故捜査方式

変電所のしゃ断器の再閉路方式と協調させた時限式事故捜査器は、時間をベースとして事故発生区間を検出し除去する一種のタイムリレーで、配電線路に設置された自動開閉器と組み合わせて使用する。

方式の概要

配電線路に事故が発生すると、変電所のリレーが検出し、配電線用しゃ断器をトリップさせ配電線を停止する。

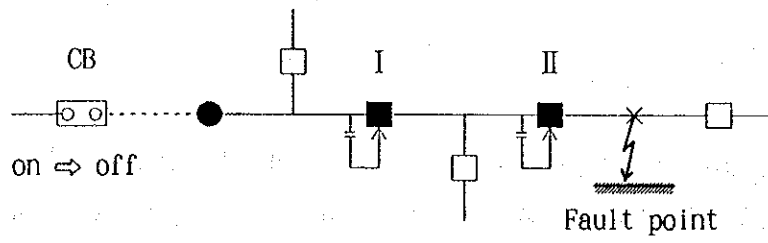
60秒後、配電線用しゃ断器を投入し、再送電により時限式事故捜査器は、X時限（投入時限）をベースに順次自動開閉器を投入してゆく。

そして、事故区間に送電されると再び変電所のリレーが事故を検出し、しゃ断器を再びトリップする。

その時点で、Y時限（検出時限）中にある時限式事故捜査器は、投入ロックし、再び電源が送電されても自動投入しない。

再しゃ断後60秒後のしゃ断器の再投入により、事故区間以前の健全区間が送電され事故区間以降が切り離される。

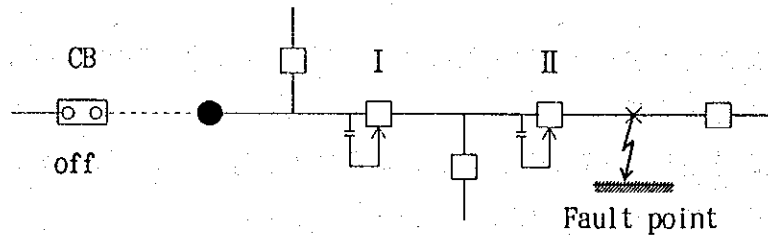
①



事故発生

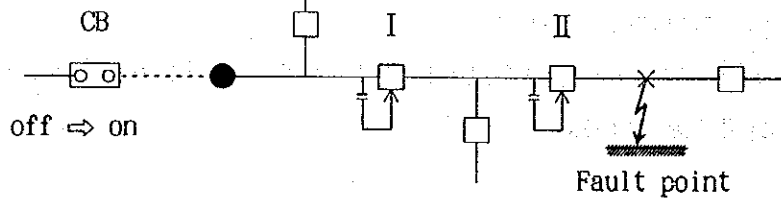
リレー動作、しゃ断器をしゃ断

②



事故捜査器は全て開放

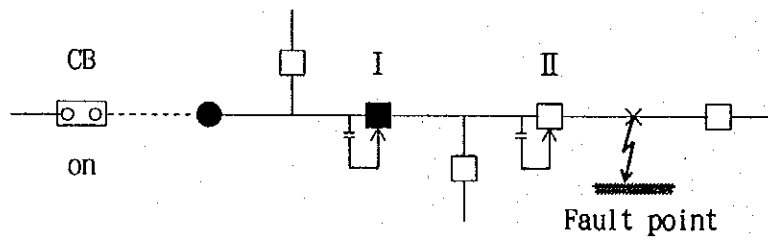
③



60秒後、再閉路

自動開閉器 (I) まで送電

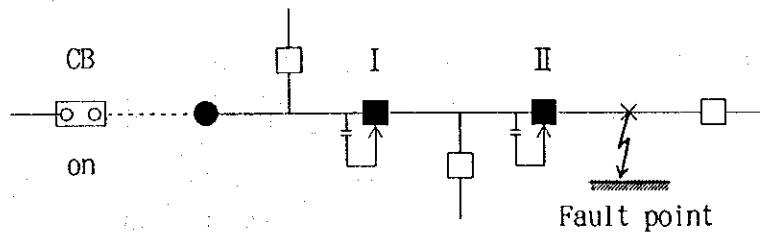
④



7秒後、自動開閉器 (I) が投入

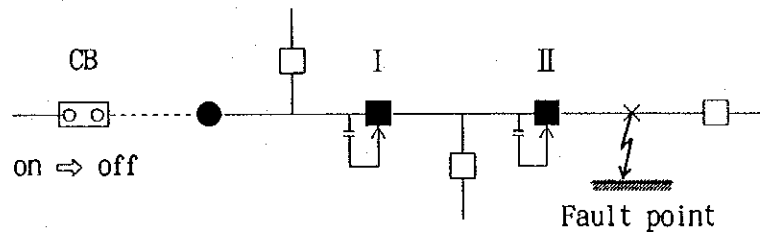
自動開閉器 (II) まで送電

⑤



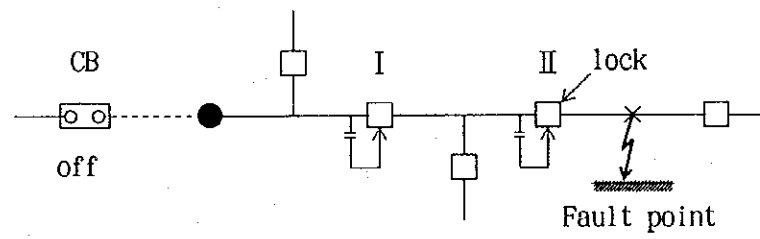
7秒後、自動開閉器（II）が投入
事故点を送電

⑥



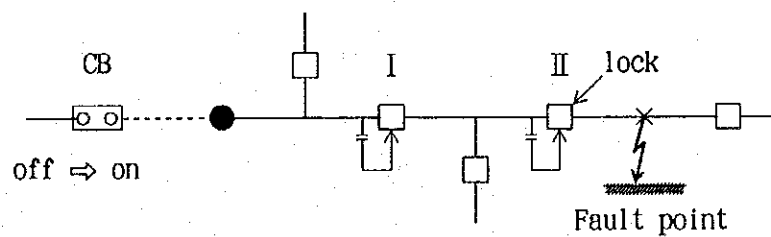
リレー動作、しゃ断器をしゃ断

⑦



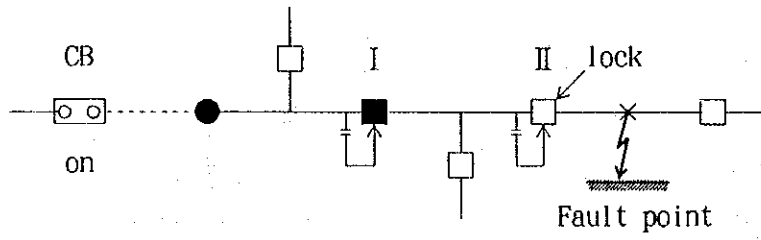
事故捜査器は全て開放
自動開閉器（II）は投入ロックとなる

⑧



60秒後、再閉路
自動開閉器（I）まで送電

⑨

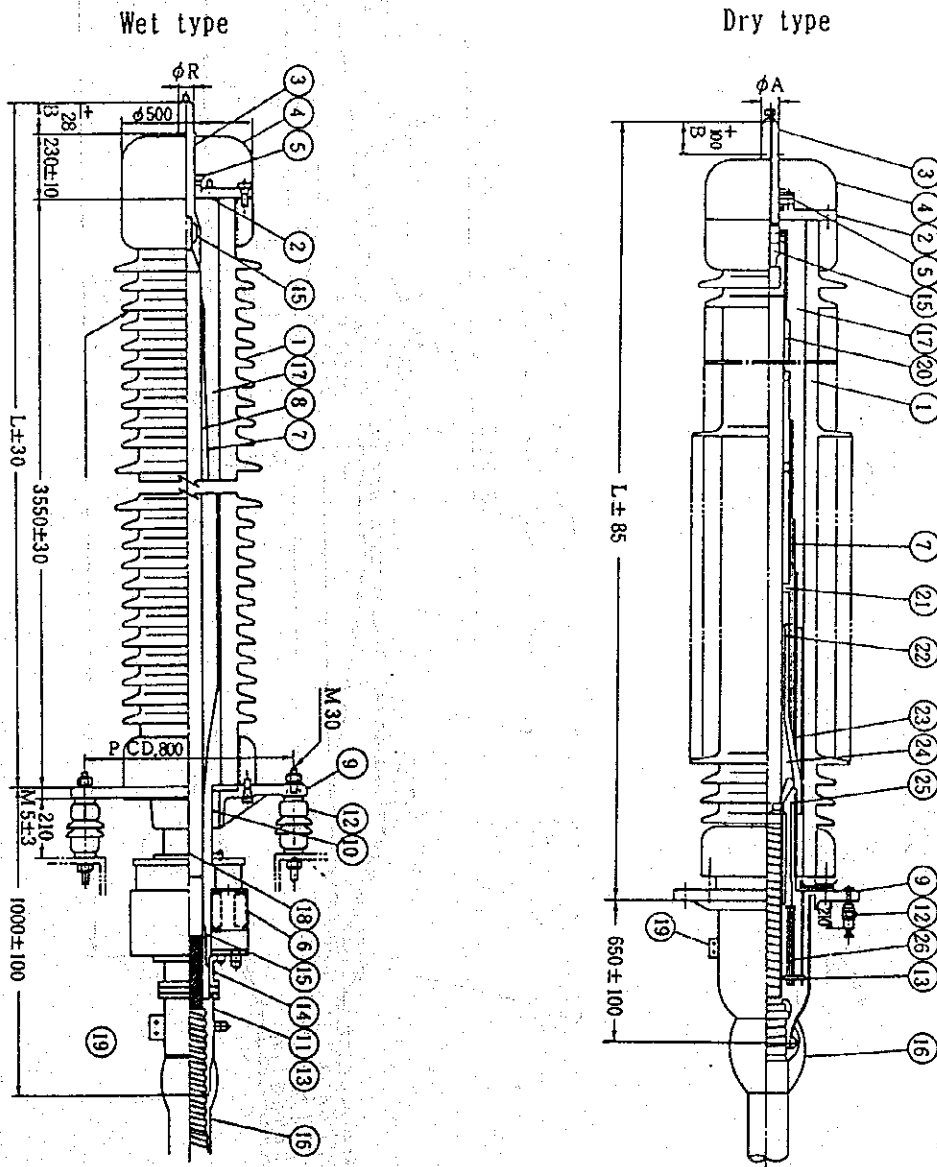


7 秒後、自動開閉器（I）が投入

自動開閉器（II）は開放状態を継続

事故区間以前の健全区間が送電され事故区間以降が切り離される

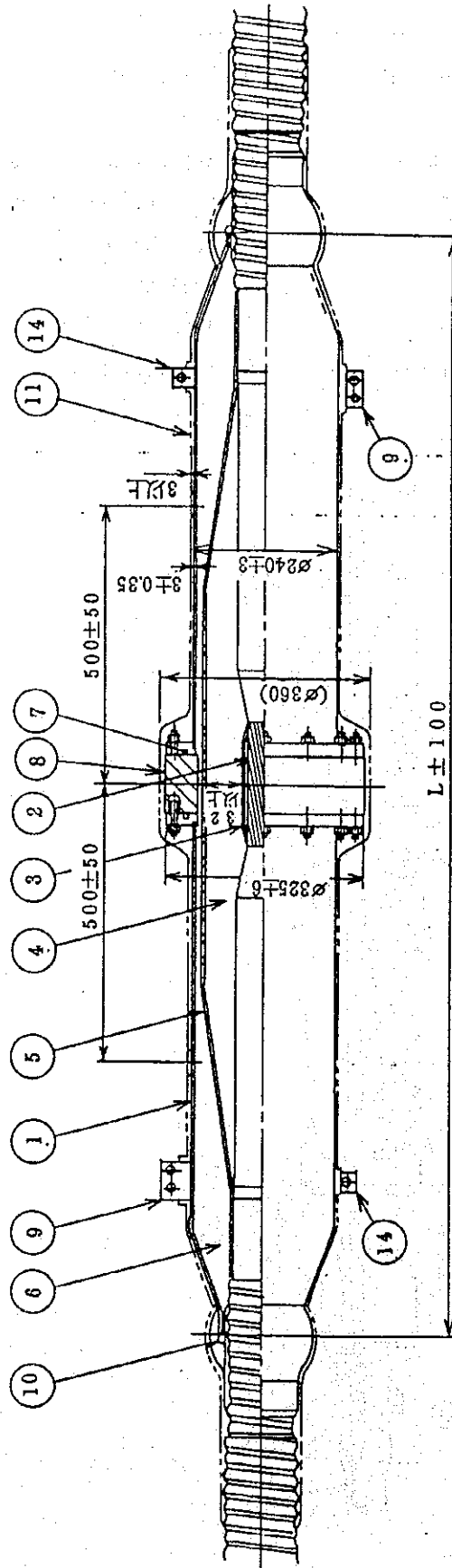
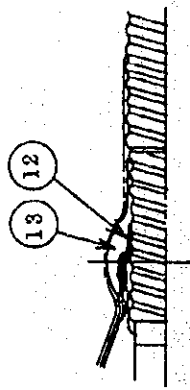
- | | | |
|-------------------------|------------------------|-----------------------|
| ① Porcelain insulator | ⑩ Lower metal | ⑲ Earth terminal |
| ② Upper plate | ⑪ Flange | ⑳ Insulator |
| ③ Leading conductor | ⑫ Supporting insulator | ㉑ Spacer |
| ④ Shielding cover | ⑬ Protective casing | ㉒ Spacer |
| ⑤ Fixing plate | ⑭ Sealing metal | ㉓ Epoxy resin support |
| ⑥ Oil reservoir | ⑮ Sealing mold | ㉔ Stress relief corn |
| ⑦ Condenser corn | ⑯ Water proof tape | ㉕ Pressing pipe |
| ⑧ Reinforced insulation | ⑰ Insulating oil | ㉖ Spring Unit |
| ⑨ Support | ⑱ Shielding | |



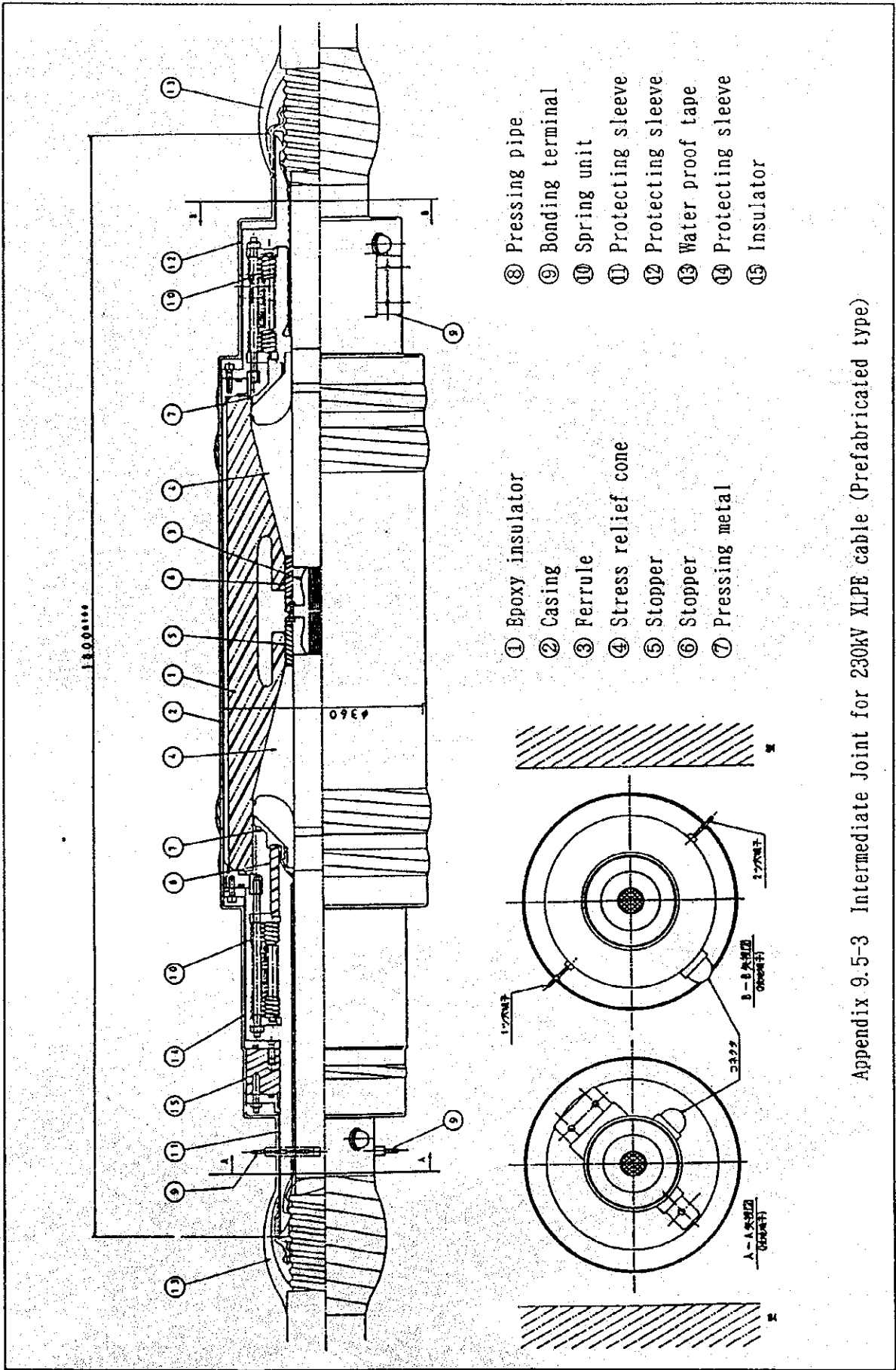
Appendix 9.5-1 Terminal Joint for 230kV XLPE cable

- ① Casing
- ② Ferrule
- ③ Inner semi-conducting layer
- ④ Insulator
- ⑤ Shielding
- ⑥ Water proof compound
- ⑦ O-ring

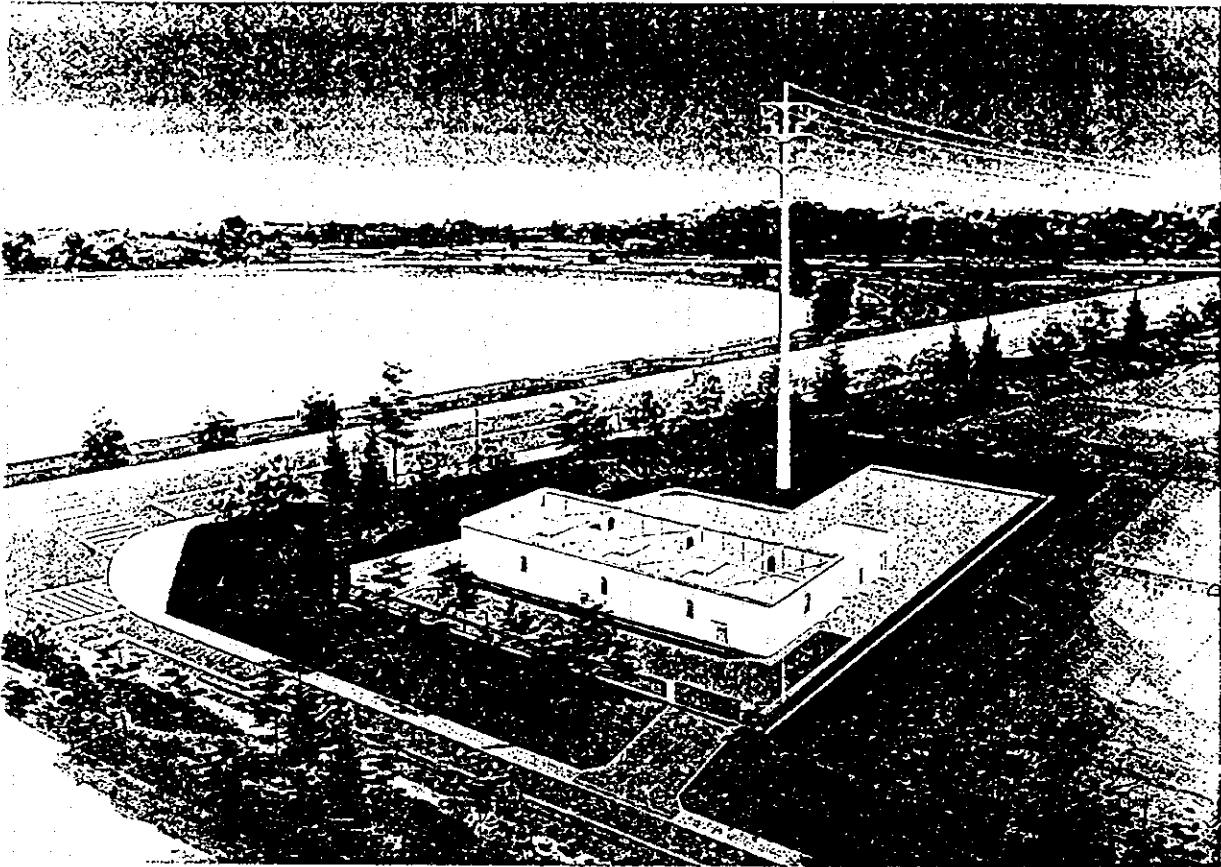
- ⑧ Epoxy insulator
- ⑨ Bonding terminal
- ⑩ Spacer
- ⑪ Outer covering wire
- ⑫ Sheath bonding wire
- ⑬ Epoxy and glass tape
- ⑭ Terminal for sheath voltage limiter



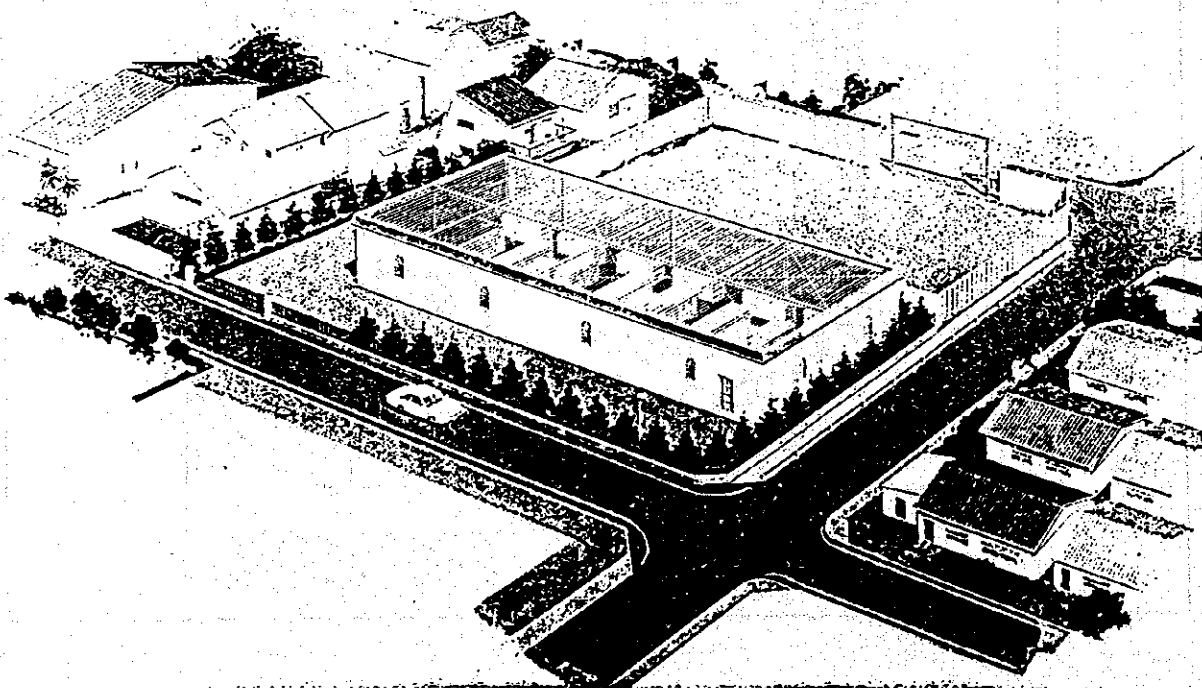
Appendix 9.5-2 Intermediate Joint for 230kV XLPE cable (Extrusion molded type)



Appendix 9.5-3 Intermediate Joint for 230kV XLPE cable (Prefabricated type)



Bird's-eye View of Distribution Substation
(Overhead incoming line)



Bird's-eye View of Distribution Substation
(Underground incoming line)

