

表 8.1 11kV配電線、電圧降下と電流容量 (3/3)

NAME OF FEEDER	1986/80		1980/81		1981/82		1982/83		1983/84		1984/85		1985/86		1986/87		1987/88		1988/89		1989/90		1990/00		2000/01		
	Voltage Regd. at End V/R(V)	Estim. of Cable Cons. V/R(V)	Voltage Regd. at End V/R(V)	Estim. of Cable Cons. V/R(V)	Voltage Regd. at End V/R(V)	Estim. of Cable Cons. V/R(V)	Voltage Regd. at End V/R(V)	Estim. of Cable Cons. V/R(V)	Voltage Regd. at End V/R(V)	Estim. of Cable Cons. V/R(V)	Voltage Regd. at End V/R(V)	Estim. of Cable Cons. V/R(V)	Voltage Regd. at End V/R(V)	Estim. of Cable Cons. V/R(V)	Voltage Regd. at End V/R(V)	Estim. of Cable Cons. V/R(V)	Voltage Regd. at End V/R(V)	Estim. of Cable Cons. V/R(V)	Voltage Regd. at End V/R(V)	Estim. of Cable Cons. V/R(V)	Voltage Regd. at End V/R(V)	Estim. of Cable Cons. V/R(V)	Voltage Regd. at End V/R(V)	Estim. of Cable Cons. V/R(V)	Voltage Regd. at End V/R(V)	Estim. of Cable Cons. V/R(V)	
LANCHUR S/S																											
Playe Bury	98.28	0	98.21	0	98.14	0	98.07	0	98.00	0	98.00	0	98.00	0	98.09	0	98.38	0	98.44	0	98.30	0	98.15	0	0	0	
Leaving	98.19	0	98.14	0	98.09	0	98.04	0	98.00	0	98.00	0	98.00	0	98.00	0	98.72	0	98.54	0	98.56	0	98.46	0	0	0	
King's Way	98.28	0	98.23	0	98.19	0	98.16	0	98.12	0	98.07	0	98.03	0	98.08	0	98.92	0	98.87	0	98.80	0	98.74	0	0	0	
Cart Drive	98.11	0	98.08	0	98.00	0	98.03	0	98.07	0	98.00	0	98.73	0	98.65	0	98.55	0	98.45	0	98.36	0	98.74	0	0	0	
BHARTAPUR SWS																											
Byan	98.25	0	98.10	0	98.06	0	98.04	0	98.02	0	98.08	0	98.52	0	98.33	0	98.13	0	97.90	0	97.65	0	97.37	0	X	X	
Neunite	98.50	0	98.42	0	98.28	0	98.09	0	97.80	0	97.65	0	97.30	0	97.12	0	96.82	0	96.48	0	95.11	0	95.71	0	0	0	
Barope	98.30	0	97.98	0	97.52	0	97.06	0	96.40	0	95.88	0	95.16	0	94.33	0	93.41	0	92.37	X	91.16	X	89.84	X	0	0	
Main Creek	98.35	0	98.23	0	98.08	0	98.00	0	98.54	0	98.45	0	98.10	0	97.90	0	97.59	0	97.19	0	96.77	0	96.70	0	0	0	
Stick	98.29	0	98.28	0	98.22	0	98.17	0	98.11	0	98.04	0	98.87	0	98.88	0	98.81	0	98.71	0	98.82	0	98.51	0	0	0	
Nagahal	98.91	0	98.25	0	98.42	0	98.58	0	98.58	0	98.44	X	98.10	X	98.85	X	98.97	X	85.11	X	82.97	X	80.55	X	0	0	
MAHARAJUNJI SWS																											
Ring's Way	Failed																										
Budhanthaha	98.43	0	98.21	0	97.98	0	97.72	0	97.12	0	96.84	0	96.82	0	96.47	0	96.06	0	95.64	0	95.17	0	94.80	0	X	X	
Balunabar	98.81	0	98.80	0	98.78	0	98.78	0	98.77	0	98.78	0	98.75	0	98.74	0	98.72	0	98.70	0	98.89	0	98.87	0	0	0	
THIMI SWS																											
Thimi	97.56	0	97.30	0	97.19	0	96.84	0	96.59	0	96.28	0	95.94	0	95.59	0	95.17	0	94.74	0	94.28	0	93.76	0	0	0	
Triley Bus	98.91	0	98.90	0	98.88	0	98.86	0	98.87	0	98.88	0	98.85	0	98.84	0	98.82	0	98.81	0	98.80	0	98.78	0	0	0	
THAPATHALI SWS																											
Tolu	98.79	0	98.78	0	98.79	0	98.79	0	98.78	0	98.78	0	98.78	0	98.77	0	98.77	0	98.76	0	98.75	0	98.74	0	0	0	
Palun	98.35	0	98.28	0	98.21	0	98.13	0	98.03	0	98.83	0	98.82	0	98.80	0	98.55	0	98.39	0	98.21	0	98.01	0	X	X	
Thapathali	98.87	0	98.87	0	98.87	0	98.87	0	98.87	0	98.87	0	98.87	0	98.86	0	98.85	0	98.88	0	98.85	0	98.85	0	0	0	
Singharbar	98.80	0	98.58	0	98.56	0	98.35	0	98.33	0	98.51	0	98.48	0	98.47	0	98.44	0	98.41	0	98.37	0	98.35	0	0	0	
Sarope	98.32	0	98.49	0	98.44	0	98.40	0	98.38	0	98.31	0	98.27	0	98.21	0	98.15	0	98.09	0	98.01	0	98.94	0	0	0	



表 8.3 年度別配電用變压器增設容量

	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01
Total Peak Demand (MW)	85.23	93.09	99.36	107.36	116.06	125.51	135.79	146.99	159.17	172.44	186.91	202.67
Increased Demand (MW)	-	7.86	6.27	8.00	8.70	9.45	10.28	11.20	12.18	13.27	14.47	15.76
Demand be increased through Trans. (95% of the above) (MW) *1	-	7.47	5.96	7.60	8.27	8.98	9.77	10.64	11.57	12.61	13.75	14.97
Total Capacity added (MVA)	*2 (194.84)	8.30	6.62	8.44	9.18	9.98	10.85	11.82	12.86	14.01	15.27	16.64

\*1 : Five (5) percents of the increased demand are assumed to be directly supplied from 11kV feeders.

\*2 : Total capacity of the existing distribution transformers

表 9.1 電力セクター効率化計画の計画内容

A) SUBSTATIONS

SUBSTATION	Description of Works
1) Lainchar	a) Dismantling existing transformers (2x10MVA) b) Transportation of dismantled transformers to Bhaktapur c) Instalation of new transformers (2x15/18MVA) d) Replacement of CTs for transformer circuits (66kV GIS)
2) New Chabel	a) Extension of one 66kV line bay for N.Bhaktapur-N.Chabel line b) Modification of existing line bays
3) Bhaktapur	New 66/11kV substation (conventional type) a) 66/11kV 2x10MVA transformers (shifted from Lainchaur) b) Two 66kV transformer bays c) Three 66kV line bays d) One bus bar e) Two station service transformers f) One 11kV indoor metal enclosed switchgear (SF6, 15 cubicles) g) One control building including site preparation
4) Sunkosi	a) Replacement of the existing line trap
5) New Baneswar	a) Addition of one transformer (3x6MVA) b) Extention of one 66kV transformer bay c) Extention of one 11kV transformer incoming bay d) Modification of existing line bays
6) Patan	a) Extention of one 66kV line bay for Siuchatar-Patan No.2 line b) Reshaping of 66kV New Baneswar line bay c) Modification of 66kV Siuchatar-Patan No.1 line bay
7) Siuchatar	a) Extention of two 132kV line bays for Marsyangdi-Balaju line b) Extention of two 66kV line bays for Teku and Paten lines c) Modification of existing line bays
8) Balaju	a) Modification of existing 66kV line bays
9) Trisuli	a) Reshaping of two existing line bays and bus bar
10) Teku	New 66kV substation (GIS or air insulated metalclad) a) 66/11kV, 2x15/18MVA transformers b) Two 66kV Transformer bays c) One 66kV line bays (without CB) d) One 66kV bus bar e) Two station service transformers f) One 11kV metal enclosed switchgear (SF6, 21 cubicles) g) shifting all 11kV feeders to new switchgear
11) Devighat	a) Modification of 66kV New Chabel bay

B) TRANSMISSION LINES

	Section		Length (km)	Specifications
	From	To		
1) New Bhaktapur	New Chabel	10.5	a) 132kV design (initially 66kV use) b) Double circuit c) ACSR Bear conductors	
2) Diversion of 66kV Sunkosi line to New Bhaktapur substation		1.75	a) 132kV design (initially 66kV use) b) Double circuit c) ACSR Bear conductors	
3) Diversion of 132kV Marsyangdi-Balaju line to Siuchtar substation		1.15	a) 132kV b) Double circuit c) ACSR Bear conductors	
4) Siuchatar	Teku	4.05	a) 66kV b) Double circuit c) ACSR Bear conductors	

Source : Draft Tender Document, Volume 1/4 = Commercial Clauses

表 9.2 電力損失軽減対策第 3 次計画の資材および機器

Following are major materials and equipment to be procured by NEA to fulfill the works for the LRP.

Material and Equipment		Quantity
(01)	Meter Testing Equipment	2 sets
(02)	Sealing materials:	
	(a) Seal Plier	500 nos.
	(b) Seal Ferrules/Wire	200,000 sets
(03)	Energy Meter w/Service Enclosure:	
	(a) Three Phase	2,000 nos.
	(b) Single Phase (*1)	60,000 nos.
(04)	Connectors	400,000 nos.
(05)	Concentric Service Cable	250 km
(06)	4-core Low Tension Cable	50 km
(07)	ACSR:	
	(a) Rabbit	250 km
	(b) Dog	100 km
(08)	Poles (Steel, Prestressed Concrete and Wooden Poles) (*2)	7,000 nos.
(09)	11kV Static Capacitor with Fuse and Mounting Bracket	60 units
(10)	11/0.4kV Distribution Transformer (250kVA) with Lighting Arrester, Drop-out Switch and Bracket	100 nos.
(11)	Tools and Equipments	1 lot
(12)	Crane and Auger Mounted Truck	6 units
(13)	Mini Truck	6 units
(14)	Load Monitor	20 sets
(15)	Aerial Bundled Cable for 11kV and L.T	75 km
(16)	Fittings for the above Aerial Bundled Cable	1 lot
(17)	Miscellaneous Items for Workshop	2 sets
(18)	Equipment for Load Management Program	1 lot

Note: (\*1) 35,000 nos. under Phase II and 25,000 nos. under Phase III

(\*2) Total number of Phase II and Phase III

表 11.1 主要機器の仕様 (1/3)

A. TRANSFORMER

		Main Transfer	Station Service	
1	Type		Oil Dry epoxy resin molded	
2	Nominal Capacity	kVA	12.6	6 100, 50
3	Number of phase		1	1 3
4	Cooling system		ONAF	ONAF AN
5	Rated frequency	Hz	50	50 50
6	Rated voltage			
	a) Primary	kV	$132/\sqrt{3}$	$66/\sqrt{3}$ 11
	b) Secondary	kV	$66/\sqrt{3}$	$11/\sqrt{3}$ 0.415-0.23
7	Rated continuous output			
	a) self cooling (ONAN)	kVA	8.6	6 100, 50
	b) Forced air cooling (ONAF)	kVA	12.6	- -
8	Impedance voltage		9.24	7.3 -
9	Connection		YNyn0	YNyn0 Dy5
10	Tap changer		On-load	On-load -
11	AC withstand voltage			
	a) 132kV side	kV	270	- -
	b) 66kV side	kV	-	140 -
	c) 11kV side	kV	-	- 28
12	Impulse withstand voltage			
	a) 132kV side	kV	650	- -
	b) 66kV side	kV	-	350 -
	c) 11kV side	kV	-	- 124
13	Kind of winding		copper	copper copper

表 11.1 主要機器の仕様 (2/3)

132kV		66kV		11kV		Low Voltage	
<b>B. SWITCHGEAREQUIPMENT</b>							
<b>(A) Circuit Breaker</b>							
1. Type							
2. Operation		SF6 gas type	SF6 gas type	SF6 or Vacuum			Molded case
3. Rated voltage		Pneumatic	Pneumatic	Motor operated			
a) Nominal	KV	132	66	11			415/230 V
b) Highest	KV	145	72	12			0.6
4. Rated current	A	800	600	1200, 800			225, 100, 50 (AF)
5. Short circuit Breaking current	KA	25	25	25			10
6. Break time	Cycle	3	3	5			-
7. Duration short circuit	Sec	2	2	2			-
8. Operation sequence		0-0.3 sec - CO-3 min-CO	0-0.3 sec - CO-3 min-CO	0-1 min - CO-3 min-CO			-
9. AC withstand voltage	KV	270	140	28			-
10. Impulse withstand voltage	KV	650	350	124			-
<b>(B) Disconnecting Switch</b>							
1. Type		Three pole, single throw	Three pole, single throw	Three pole, single throw			
2. Operation		Motor driven and/or manual	Motor driven and/or manual	Motor driven and/or manual			
3. Rated voltage							
a) Nominal	KV	132	66	11			
b) Highest	KV	145	72	12			
4. Rated current	A	800	1200				
5. Rated short time current	KA	25	25	25			
6. AC withstand voltage	KV	270	140	28			
7. Impulse withstand voltage	KV	650	350	75			
<b>(C) Potential device</b>							
1. Type		Single phase oil filled potential device	Single phase oil filled potential device	Single phase, molded			Single phase, molded
2. Rated voltage							
a) Nominal	KV	132/√3	66/√3	11			0.415/√3
b) Highest	V	110/√3	110/√3	110			110/√3
3. Rated burden	VA	100	200	200			100
4. Accuracy class		0.5	1.0	1.0			1.0
5. AC withstand voltage	KV	270	140	28			
6. Impulse withstand voltage	KV	650	350	124			

表 11.1 主要機器の仕様 (3/3)

		132kV	66kV	11kV	Low Voltage
(D) Current transformer					
1. Type		Single phase oil filled	Single phase oil filled	Single phase, molded	Single phase, molded
2. Rated voltage					
a) Nominal	kV	$132/\sqrt{3}$	$66/\sqrt{3}$	11	$0.415/\sqrt{3}$
b) Highest	V	$110/\sqrt{3}$	$110/\sqrt{3}$	110	$110/\sqrt{3}$
3. Rated current					
a) Primary	A	200-100	200-100	600-300	75
b) Secondary	A	5	5	5	5
4. Rated burden	VA	100	200	200	100
5. Accuracy class		0.5	1.0	1.0	1.0
6. AC withstand voltage	kV	270	140	28	
7. Impulse withstand voltage	kV	650	350	124	
(E) Power Fuse		N/A	N/A		N/A
1. Type				Single pole, current limiting, DS type, hook stick operated	
2. Operation					
3. Rated maximum voltage	kV	-	-	12	-
4. Rated current	A	-	-	10, 5	-
5. Short circuit breaking current	kA	-	-	25	-

N/A means "Not Applicable".



表 12.1 配電用資材および機器 (11kV幹線フィーダー)

11KV MAIN FEEDERS MATERIALS AND EQUIPMENT	KTM CENTRAL		KTM EAST				KTM WEST		LALITPUR		BHAKTAPUR	TOTAL
	Center of Town	Boudha- Jorpati (4km)	Baneswar (2.5km)	Baratgau- Gokarneswar (3km)	Airport Feeder (2.6km)	Sundarijal Feeder (9km)	Thankot Feeder (4km+4km)	Dharmas- lhali (2km)	Godawan 1 & 2 (3km)	Pharping Feeder (3.5km)	Nagarkot (4.5km+ 2.5km+2km)	QTY FOR 11KV MAIN FEEDERS
	Rqd Q'ty	Rqd Q'ty	Rqd Q'ty	Rqd Q'ty	Rqd Q'ty	Rqd Q'ty	Rqd Q'ty	Rqd Q'ty	Rqd Q'ty	Rqd Q'ty	Rqd Q'ty	
ACSR:												
WEASEL (km)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RABBIT (km)	0.0	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0	0.0	10.0
DOG (km)	6.0	25.0	0.0	10.0	9.0	30.0	26.0	6.0	10.0	12.0	30.0	164.0
Joint of ACSR:												
Weasel (pcs)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rabbit (pcs)	0.0	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0	0.0	10.0
Dog (pcs)	6.0	25.0	0.0	10.0	9.0	30.0	26.0	6.0	10.0	12.0	30.0	164.0
Tension Clamp of ACSR:												
Weasel (pcs)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rabbit (pcs)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dog (pcs)	180.0	210.0	360.0	180.0	210.0	420.0	180.0	60.0	150.0	150.0	420.0	2,520.0
11kV U/G CABLE: 3 CORES												
100 sq.mm (km)	1.0	1.0	0.3	0.2	0.0	0.0	0.3	0.3	0.2	0.5	0.1	3.9
200 sq.mm (km)	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
C.H for 100 sq.mm (set)	20.0	18.0	6.0	4.0	0.0	0.0	6.0	4.0	2.0	6.0	4.0	68.0
C.H for 200 sq.mm (set)	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0
11kV AI-OE Cable: 1 CORE												
60 sq.mm (km)	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0
100 sq.mm (km)	4.0	0.0	9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.0
Joint (60 sq.mm) (pcs)	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0
Joint (100 sq.mm) (pcs)	10.0	0.0	12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.0
11kV ICCT POLES:												
Transform.: H (set)	5.0	10.0	10.0	5.0	5.0	10.0	15.0	2.0	5.0	5.0	13.0	85.0
Dead End (pcs)	0.0	0.0	0.0	0.0	10.0	10.0	5.0	3.0	5.0	0.0	9.0	42.0
Straight (pcs)	0.0	0.0	0.0	0.0	27.0	120.0	60.0	20.0	35.0	0.0	90.0	352.0
Angle (pcs)	0.0	0.0	0.0	0.0	20.0	50.0	10.0	5.0	15.0	0.0	31.0	131.0
ICCT POLES *:												
Dead End (pcs)	5.0	10.0	10.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.0
Straight (pcs)	10.0	45.0	35.0	30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	120.0
Angle (pcs)	9.0	15.0	15.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	59.0
2CCT POLES:												
Dead End (pcs)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	7.0	12.0
Straight (pcs)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	35.0	20.0	55.0
Angle (pcs)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	10.0	25.0
11kV Switch:												
Section (set)	10.0	2.0	1.0	1.0	0.0	3.0	2.0	2.0	3.0	3.0	3.0	30.0
Auto-Recl (set)	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	2.0
Multi-cct (set)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
POLE TRANSFORMER:												
25 kVA (set)	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	3.0	5.0
50 kVA (set)	0.0	0.0	4.0	1.0	0.0	3.0	5.0	0.0	0.0	0.0	8.0	21.0
100 kVA (set)	9.0	5.0	1.0	4.0	0.0	5.0	5.0	2.0	5.0	2.0	2.0	40.0
150 kVA (set)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
200 kVA (set)	0.0	5.0	1.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	11.0
250 kVA (set)	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0
400/300V POLES (set)	30.0	50.0	0.0	20.0	0.0	0.0	30.0	10.0	50.0	50.0	90.0	330.0
400/230V AI-OW Cable:												
55 sq.mm (km)	0.0	20.0	14.0	15.0	0.0	20.0	0.0	0.0	8.0	16.0	40.0	133.0
95 sq.mm (km)	0.0	0.0	0.0	0.0	0.0	0.0	10.0	8.0	0.0	0.0	0.0	18.0
Joint (pcs)	0.0	20.0	14.0	15.0	0.0	20.0	10.0	8.0	8.0	16.0	40.0	151.0
11kV Drop-out Sw. (pcs)	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.0
11kV Lightn. Arrest. (pcs)	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.0
11kV Pin Insulator (pcs)	0.0	0.0	0.0	0.0	100.0	0.0	200.0	0.0	0.0	110.0	150.0	560.0
254mm dia. Disc Ins. (pcs)	0.0	0.0	0.0	0.0	210.0	0.0	60.0	0.0	0.0	150.0	60.0	480.0

Notes: (1) Poles include cross-arms, stay-wires w/anchor, transformer platforms, cutout switches, L.As, Distribution Panel, Grounding System, Drop-Wires, etc. necessary for complete set.  
(2) Multi-Circuit Switching Yard includes supports, switches (4 feeders) other necessary equipment.  
(3) Poles marked with \* are provided with support insulators in the vertical conductor arrangement.

表 12.2 配電用資材および機器 (その他の11kVフィーダー)

11kV MAIN FEEDERS		KTM CENTRAL		KTMEAST	KTM WEST		LALITPUR	BHAKTAPUR		TOTAL QTY FOR 11KV OTHER FEEDERS
		Ring Road	Additional Materials	Additional Materials	Kirtipur Feeder	Additional Materials	Additional Materials	Nagarkot Feeder	Thimi Feeder	
MATERIALS AND EQUIPMENT		Rqd Q'ty	Rqd Q'ty	Rqd Q'ty	Rqd Q'ty	Rqd Q'ty	Rqd Q'ty	Rqd Q'ty	Rqd Q'ty	Rqd Q'ty
ACSR:										
WEASEL	(km)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RABBIT	(km)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DOG	(km)	6.0	1.0	10.0	5.0	0.0	15.0	6.0	12.0	5.0
Joint of ACSR:										
Weasel	(pcs)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rabbit	(pcs)	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	10.0
Dog	(pcs)	6.0	2.0	10.0	5.0	0.0	15.0	6.0	12.0	5.0
Tension Clamp of ACSR:										
Weasel	(pcs)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rabbit	(pcs)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dog	(pcs)	60.0	0.0	300.0	66.0	0.0	100.0	100.0	200.0	30.0
11kV LVG CABLE: 3 CORES										
100 sq.mm	(km)	0.0	5.0	1.0	0.0	0.0	2.5	0.0	0.1	2.0
200 sq.mm	(km)	0.0	5.0	0.0	0.0	0.0	1.5	0.0	0.0	0.5
C.H for 100 sq.mm	(set)	0.0	10.0	10.0	0.0	0.0	10.0	0.0	2.0	6.0
C.H for 200 sq.mm	(set)	0.0	10.0	0.0	0.0	0.0	6.0	0.0	0.0	4.0
11kV AI-OE Cable: 1 CORE										
60 sq.mm	(km)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0
100 sq.mm	(km)	0.0	6.0	5.0	0.0	6.0	0.0	0.0	0.0	17.0
Joint (60 sq.mm)	(pcs)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0
Joint (100 sq.mm)	(pcs)	0.0	6.0	5.0	0.0	6.0	0.0	0.0	0.0	17.0
11kV 1CCT POLES:										
Transform.: H	(set)	2.0	20.0	14.0	2.0	20.0	30.0	2.0	5.0	10.0
Dead End	(pcs)	2.0	10.0	10.0	4.0	10.0	0.0	4.0	3.0	10.0
Straight	(pcs)	24.0	56.0	50.0	19.0	60.0	200.0	24.0	47.0	40.0
Angle	(pcs)	6.0	10.0	26.0	5.0	30.0	0.0	10.0	15.0	30.0
1CCT POLES *:										
Dead End	(pcs)	0.0	0.0	0.0	0.0	0.0	20.0	0.0	0.0	0.0
Straight	(pcs)	0.0	0.0	0.0	0.0	0.0	150.0	0.0	0.0	0.0
Angle	(pcs)	0.0	0.0	0.0	0.0	0.0	50.0	0.0	0.0	0.0
2CCT POLES:										
Dead End	(pcs)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Straight	(pcs)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Angle	(pcs)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11kV Switch:										
Section	(set)	1.0	10.0	7.0	1.0	7.0	5.0	1.0	1.0	17.0
Auto-Rec	(set)	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0
Multi-cct	(set)	0.0	0.0	1.0	0.0	2.0	2.0	0.0	0.0	0.0
POLE TRANSFORMER:										
25 kVA	(set)	0.0	5.0	3.0	1.0	3.0	15.0	0.0	0.0	23.0
50 kVA	(set)	0.0	0.0	7.0	1.0	7.0	10.0	2.0	0.0	15.0
100 kVA	(set)	2.0	5.0	0.0	0.0	3.0	25.0	0.0	3.0	10.0
150 kVA	(set)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
200 kVA	(set)	0.0	10.0	4.0	0.0	10.0	17.0	0.0	0.0	6.0
250 kVA	(set)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
400/300V POLES	(set)	50.0	0.0	0.0	20.0	0.0	0.0	25.0	40.0	0.0
400/230V AI-OE Cable:										
55 sq.mm	(km)	0.0	0.0	0.0	6.0	0.0	0.0	16.0	0.0	0.0
95 sq.mm	(km)	7.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	0.0
Joint	(pcs)	7.0	0.0	0.0	6.0	0.0	0.0	16.0	8.0	0.0
11kV Drop-out Sw.	(pcs)	0.0	100.0	50.0	0.0	50.0	210.0	0.0	0.0	110.0
11kV Lightn. Arrest.	(pcs)	0.0	100.0	50.0	0.0	50.0	210.0	0.0	0.0	110.0
11kV Pin Insulator	(pcs)	0.0	0.0	0.0	0.0	600.0	600.0	0.0	0.0	500.0
254mm dia. Disc Ins.	(pcs)	0.0	0.0	0.0	0.0	200.0	100.0	0.0	0.0	200.0

Note: (1) Poles include cross-arms, stay-wires w/anchor, transformer platforms, cutout switches, L.As, Distribution Panel, Grounding System, Drop-Wires, etc. necessary for complete set.

(2) Multi-Circuit Switching Yard includes supports, switches (4 feeders) other necessary equipment.

(3) Poles marked with \* are provided with support insulators on one-shoulder conductor arrangement.

表 12.3 低圧配電線用資材よび機器

LOW TENSION NETWORK		KTM CENTRAL	KTM EAST	KTM WEST	LALITPUR	BHAKTAPUR	TOTAL
MATERIALS AND EQUIPMENT		R'qd Q'ty	R'qd Q'ty	R'qd Q'ty	R'qd Q'ty	R'qd Q'ty	R'qd Q'ty
ACSR:							
WEASEL	(km)	15.0	15.0	15.0	85.0	60.0	190.0
RABBIT	(km)	40.0	20.0	25.0	55.0	35.0	175.0
Joint of ACSR:							
Weasel	(pcs)	15.0	15.0	15.0	85.0	60.0	190.0
Rabbit	(pcs)	40.0	20.0	25.0	55.0	35.0	175.0
Tension Clamp of ACSR:							
Weasel	(pcs)	200.0	200.0	200.0	200.0	200.0	1,000.0
Rabbit	(pcs)	200.0	200.0	200.0	200.0	200.0	1,000.0
L.T Al-OW Cable: (1-core)							
25 sq.mm (2 core)	(km)	20.0	0.0	0.0	0.0	0.0	20.0
25 sq.mm	(km)	40.0	5.0	0.0	0.0	0.0	45.0
35 sq.mm	(km)	0.0	0.0	0.0	2.0	2.0	4.0
50 sq.mm	(km)	0.0	0.0	0.0	0.0	0.0	0.0
95 sq.mm	(km)	0.0	0.0	0.0	0.0	0.0	0.0
100 sq.mm	(km)	8.0	0.0	0.0	0.0	0.0	8.0
150 sq.mm	(km)	12.0	0.0	0.0	8.0	8.0	28.0
240 sq.mm	(km)	4.0	0.0	0.0	0.0	4.0	8.0
300 sq.mm	(km)	0.0	0.0	0.0	2.0	2.0	4.0
Cable connector:							
25 sq.mm *	(km)	120.0	10.0	0.0	0.0	0.0	130.0
35 sq.mm *	(km)	0.0	0.0	0.0	5.0	5.0	10.0
50 sq.mm	(km)	0.0	10.0	0.0	10.0	0.0	20.0
95 sq.mm	(km)	0.0	0.0	0.0	0.0	0.0	0.0
100 sq.mm	(km)	20.0	0.0	0.0	0.0	0.0	20.0
150 sq.inm	(km)	30.0	0.0	0.0	20.0	20.0	70.0
240 sq.mm	(km)	10.0	0.0	0.0	0.0	10.0	20.0
300 sq.mm	(km)	0.0	0.0	0.0	5.0	5.0	10.0
L.T U/G XLPE Cable:							
50 sq.mm (4 core)	(km)	2.0	0.0	0.0	0.0	0.0	2.0
100 sq.mm (4 core)	(km)	2.0	0.0	0.0	0.0	0.0	2.0
Cable Head for the above:							
50 sq.mm	(pcs)	5.0	0.0	0.0	0.0	0.0	5.0
100 sq.mm	(pcs)	5.0	0.0	0.0	0.0	0.0	5.0
Service Wire:							
6 sq.mm	(km)	15.0	0.0	0.0	0.0	0.0	15.0
25 sq.mm	(km)	30.0	0.0	0.0	0.0	0.0	30.0
400/230V POLES (set)		150.0	200.0	230.0	550.0	415.0	1,545.0
Spool Ins. w/Fitting	(pcs)	800.0	800.0	1,000.0	2,200.0	2,000.0	6,800.0
MCCB with Box:							
50A (4 branches)	(nos)	10.0	10.0	10.0	15.0	15.0	60.0
100A (4 branches)		0.0	15.0	10.0	57.0	69.0	151.0
175A (4 branches)		68.0	15.0	10.0	52.0	6.0	151.0
200A (4 branches)		0.0	0.0	0.0	30.0	50.0	80.0
300A (4 branches)	(pcs)	38.0	10.0	15.0	7.0	2.0	72.0
400A (4 branches)	(pcs)	25.0	0.0	0.0	20.0	7.0	52.0

表 13.1 11kVフィーダーの計画実施優先順位

FEEDER	VOLTAGE DROP		COND. CAPACITY		LOSS REDUCTION (MWH)		TOTAL WEIGHTING POINT	PRIORITY
	YEAR	WEIGHT	YEAR	WEIGHT	ANNUAL	WEIGHT		
SUNDARIJAL	1989/90	13	1996/97	6	442	7	26	2
GODAWARI-1	1993/94	9	Beyond 01	1	440	7 ]	21.5	3
GODAWARI-2	1989/90	13	1988/99	4	903	9 ]		
BOUDHA-JORPATI	1993/94	9	1990/91	12	2279	13	34	1
THANKOT	1992/93	10	2000/01	2	898	9	21	4
B.I.D	Beyond 01	1	1992/93	10	-	1	12	9
OLD PATAN-1	Beyond 01	1	1993/94	9	-	1	11	10
AIRPORT (N. BANES)	1993/94	9	1995/96	7	-	1	17	5
KIRTIPUR	1994/95	8	2000/01	2	430	7	17	5
AIRPORT (N. CHABE)	2000/01	2	1994/95	8	297	5	15	7
BANESWAR	1998/99	4	1994/95	8	173	3	15	7
NAGARKOT	1994/95	8	Beyond 01	1	278	5	14	8
PHARPING	1995/96	7	2000/01	2	358	7	16	6

NOTE: Weighting of priority for the voltage regulation an conductor current carrying capacity is 13 points for the year 1989/90 to 1 point for the year over 2000/01.

YEAR	89/90	90/91	91/92	92/93	93/94	94/95	95/96	96/97	97/98	98/99	99/00	00/01	OVER
WEIGHT	13	12	11	10	9	8	7	6	5	4	3	2	1

While, weighting for the energy loss reduction is assumed at 13 points for reduction of more than 1,000 MWh/year, 9 for 500-999 MWh/year, 7 for 300-499 MWh/year, 5 for 200-299 MWh/year, 3 for 100-199 MWh/year and 1 for less than 100 MWh/year



表 14.2 经济的内部收益率

F.Year	Investment Cost (1000\$)					O/M Cost (1000\$)	Total Cost (1000\$)	Energy Sales (GWh)	Add. Energy Sales (GWh)	Add. Revenue (1000\$)	Balance (1000\$)
	PSEP (IDA)	JICA T/L&S/S	JICA MV	LRP (IDA)	JICA LV						
0 1991/92	4554			1087		5641	5641	295.00	0.00	0	-5641
1 1992/93	4761		7112	1164		13037	113	325.50	30.50	3562	-9587
2 1993/94	4761		4106	1164		10031	374	359.00	64.00	7475	-2929
3 1994/95	1794	10124	6359	465	4312	23054	574	395.80	100.80	11773	-11855
4 1995/96		5752	3681		1068	10501	1035	436.40	141.40	16516	4979
5 1996/97							1245	1245	187.40	21888	20643
6 1997/98							1245	1245	187.40	21888	20643
7 1998/99							1245	1245	187.40	21888	20643
8 1999/00							1245	1245	187.40	21888	20643
9 2001/02							1245	1245	187.40	21888	20643
10 2002/03							1245	1245	187.40	21888	20643
11 2003/04							1245	1245	187.40	21888	20643
12 2004/05							1245	1245	187.40	21888	20643
13 2005/06							1245	1245	187.40	21888	20643
14 2006/07							1245	1245	187.40	21888	20643
15 2007/08							1245	1245	187.40	21888	20643
16 2008/09							1245	1245	187.40	21888	20643
17 2009/10							1245	1245	187.40	21888	20643
18 2010/11							1245	1245	187.40	21888	20643
19 2011/12							1245	1245	187.40	21888	20643
20 2012/13							1245	1245	187.40	21888	20643
21 2013/14							1245	1245	187.40	21888	20643
22 2014/15							1245	1245	187.40	21888	20643
23 2015/16							1245	1245	187.40	21888	20643
24 2016/17							1245	1245	187.40	21888	20643
25 2017/18							1245	1245	187.40	21888	20643
26 2018/19							1245	1245	187.40	21888	20643
27 2019/20							1245	1245	187.40	21888	20643
28 2020/21							1245	1245	187.40	21888	20643
29 2021/22							1245	1245	187.40	21888	20643
30 2022/23							1245	1245	187.40	21888	20643
31 2023/24							1245	1245	187.40	21888	20643
32 2024/25							1245	1245	187.40	21888	20643
33 2025/26							1245	1245	187.40	21888	20643
34 2026/27							1245	1245	187.40	21888	20643

Remarks :

EIRR 35.10 %

a) Exchange rate : 1 US\$ = Rs.28.6

b) Unit Benefit : Long-Run Marginal Cost

(LRMG and Tariff Study, Dec. 1990, EDF)

HV Customer : Rs.2.01/kWh )

MV Customer : Rs.3.34/kWh )

LV Customer : Rs.5.35/kWh )

Rs.5.35 - Rs.2.01 = Rs.3.34 (US\$0.1168/kWh)

表 14.3 財務的内部收益率

F.Year	Investment Cost (1000\$)						O/M Cost (1000\$)	Total Cost (1000\$)	Energy Sales (GWh)	Add. Energy Sales (GWh)	Add. Revenue (1000\$)	Balance (1000\$)
	PSEP	JICA	JICA	LRP	JICA	Total						
	(IDA)	T/L&S/S	MV	(IDA)	LV							
0	1991/92	4600			1104		5704	295.00	0.00	0	-5704	
1	1992/93	4830			7112	1190	13132	114	325.50	30.50	-10931	
2	1993/94	4830			4170	1190	10190	377	359.00	64.00	-5709	
3	1994/95	1840	10124	6359	482	4312	23117	581	395.80	100.80	-16047	
4	1995/96		5862	3726		1082	10670	1043	436.40	141.40	-981	
5	1996/97							1256	1256	187.40	12967	
6	1997/98							1256	1256	187.40	12968	
7	1998/99							1256	1256	187.40	12968	
8	1999/00							1256	1256	187.40	12968	
9	2001/02							1256	1256	187.40	12968	
10	2002/03							1256	1256	187.40	12968	
11	2003/04							1256	1256	187.40	12968	
12	2004/05							1256	1256	187.40	12968	
13	2005/06							1256	1256	187.40	12968	
14	2006/07							1256	1256	187.40	12968	
15	2007/08							1256	1256	187.40	12968	
16	2008/09							1256	1256	187.40	12968	
17	2009/10							1256	1256	187.40	12968	
18	2010/11							1256	1256	187.40	12968	
19	2011/12							1256	1256	187.40	12968	
20	2012/13							1256	1256	187.40	12968	
21	2013/14							1256	1256	187.40	12968	
22	2014/15							1256	1256	187.40	12968	
23	2015/16							1256	1256	187.40	12968	
24	2016/17							1256	1256	187.40	12968	
25	2017/18							1256	1256	187.40	12968	
26	2018/19							1256	1256	187.40	12968	
27	2019/20							1256	1256	187.40	12968	
28	2020/21							1256	1256	187.40	12968	
29	2021/22							1256	1256	187.40	12968	
30	2022/23							1256	1256	187.40	12968	
31	2023/24							1256	1256	187.40	12968	
32	2024/25							1256	1256	187.40	12968	
33	2025/26							1256	1256	187.40	12968	
34	2026/27							1256	1256	187.40	12968	

Remarks :

a) Exchange rate :

1 US\$ = Rs.28.6

FIRR

21.30 %

b) Unit Benefit :

Theoretical Tariffs (Average=Rs.2.75/kWh)

(LRMG and Tariff Study, Dec. 1990, EDF)

HV Customer Rs.1.04/kWh )

MV Customer Rs.1.50/kWh ) Rs.3.21 - Rs.1.04 = Rs.2.17 (US\$ 0.0759/kWh)

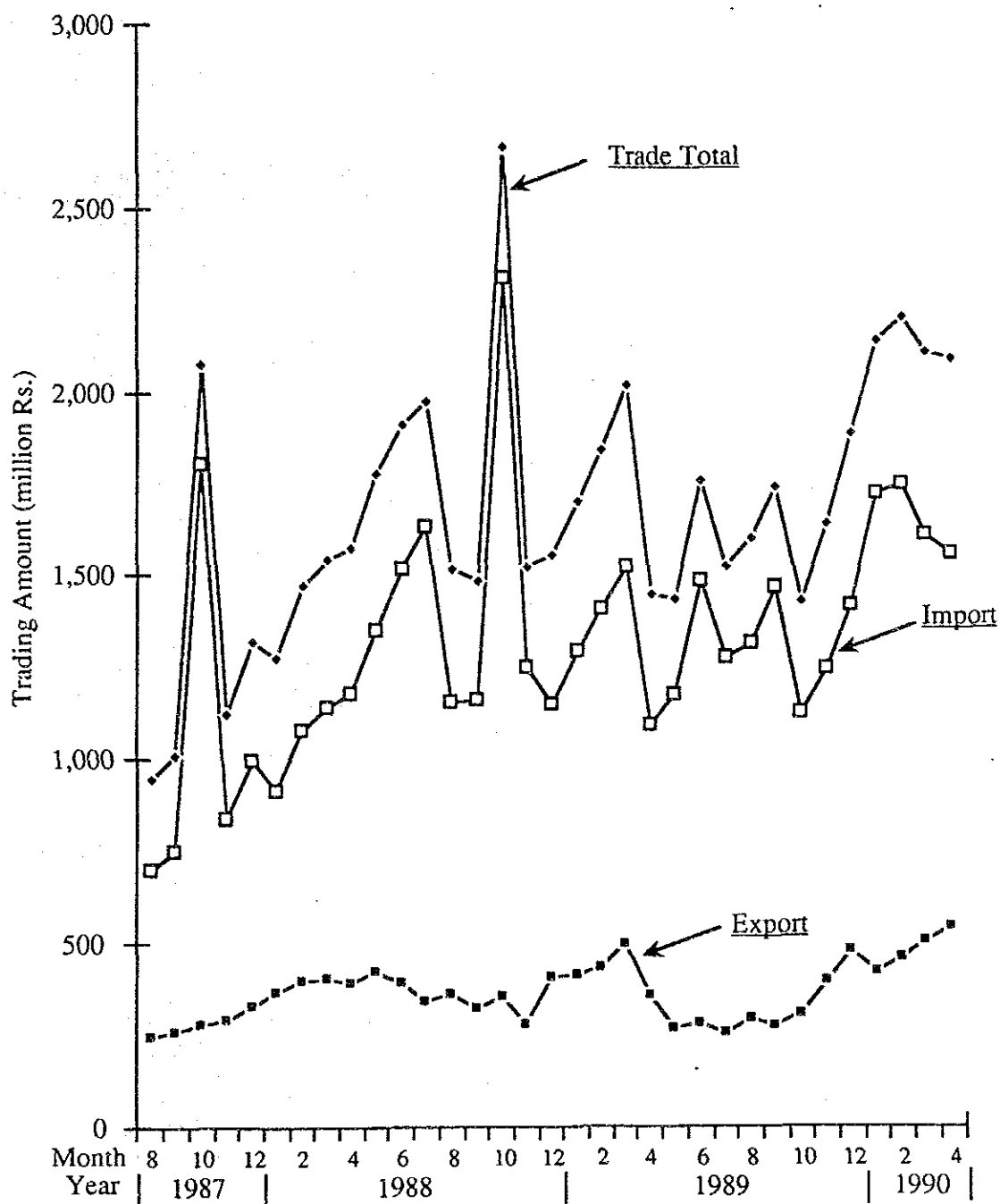
LV Customer Rs.3.21/kWh )











ネパール王国  
カトマンス地区送配電網拡張整備計画調査

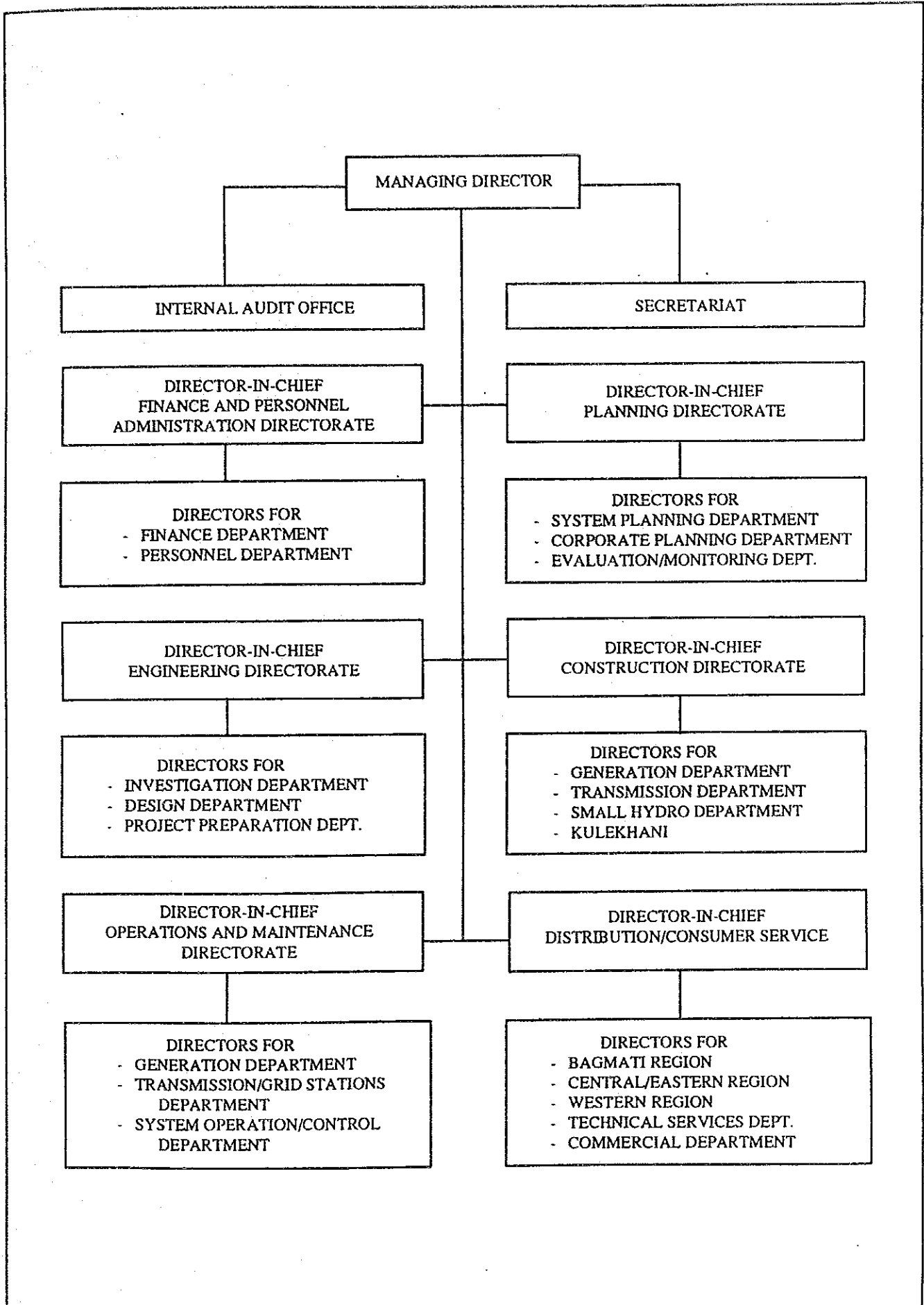
NEPAL ELECTRICITY AUTHORITY

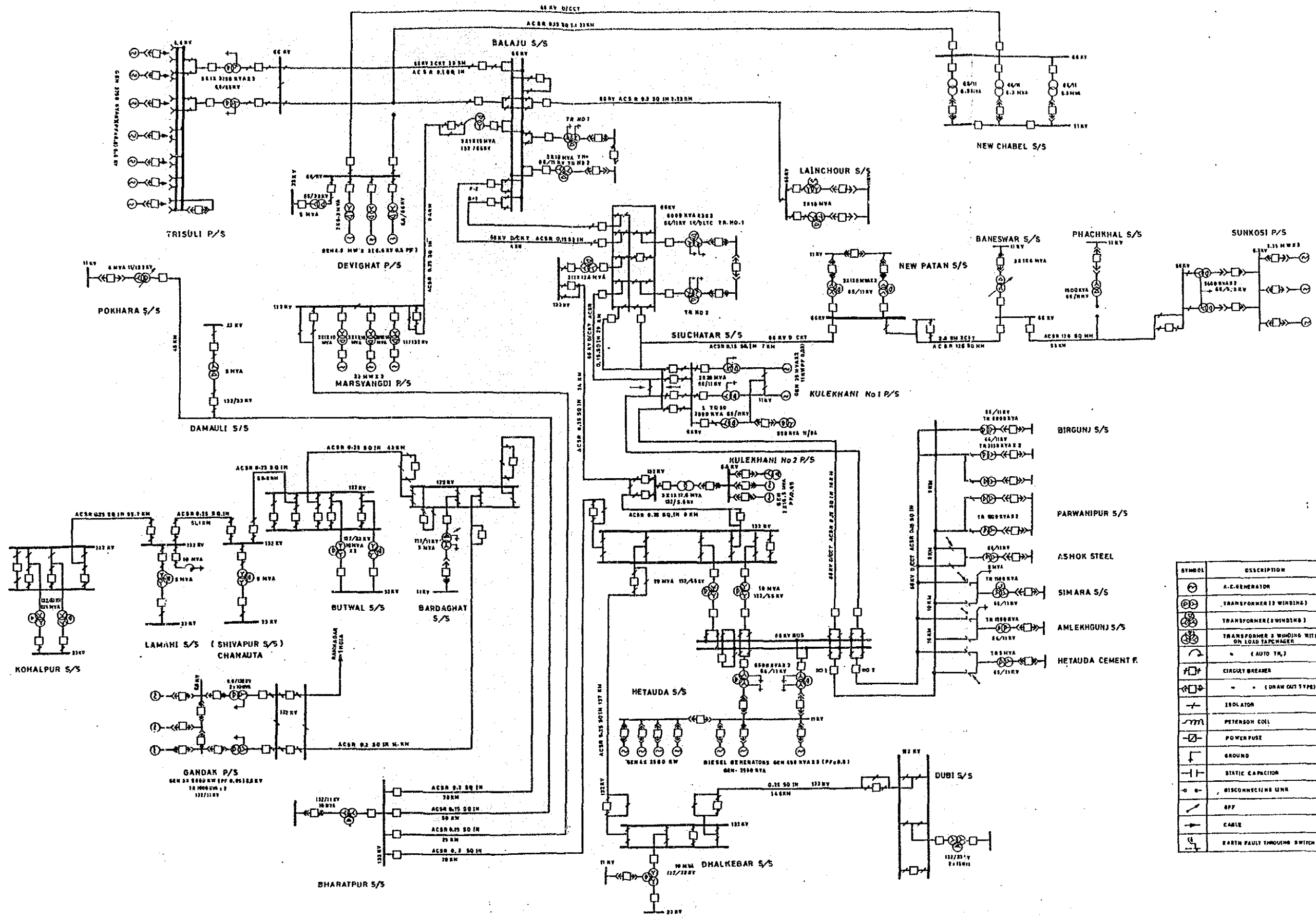
国際協力事業団

TITLE

図 3.1  
月別輸出入の動向

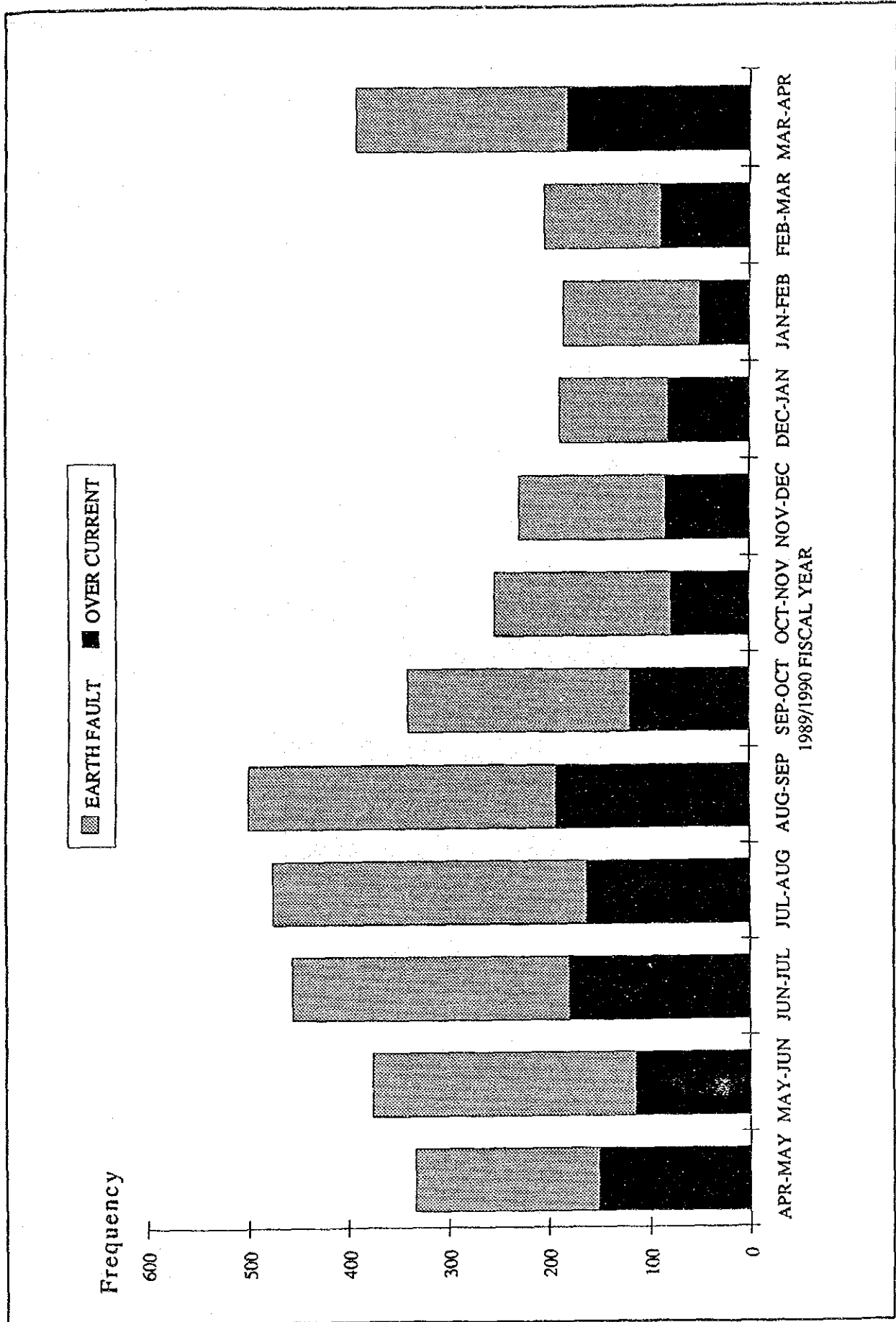






SYMBOL	DESCRIPTION
	A-C GENERATOR
	TRANSFORMER (1 WINDING)
	TRANSFORMER (2 WINDING)
	TRANSFORMER 3 WINDING WITH ON LOAD TAPCHANGER
	AUTO TR.
	CIRCUIT BREAKER
	(DRAW OUT TYPE)
	ISOLATOR
	PETERSON COIL
	POWER FUSE
	GROUND
	STATIC CAPACITOR
	DISCONNECTION LINK
	APP
	CABLE
	EARTH FAULT THROUGH SWITCH

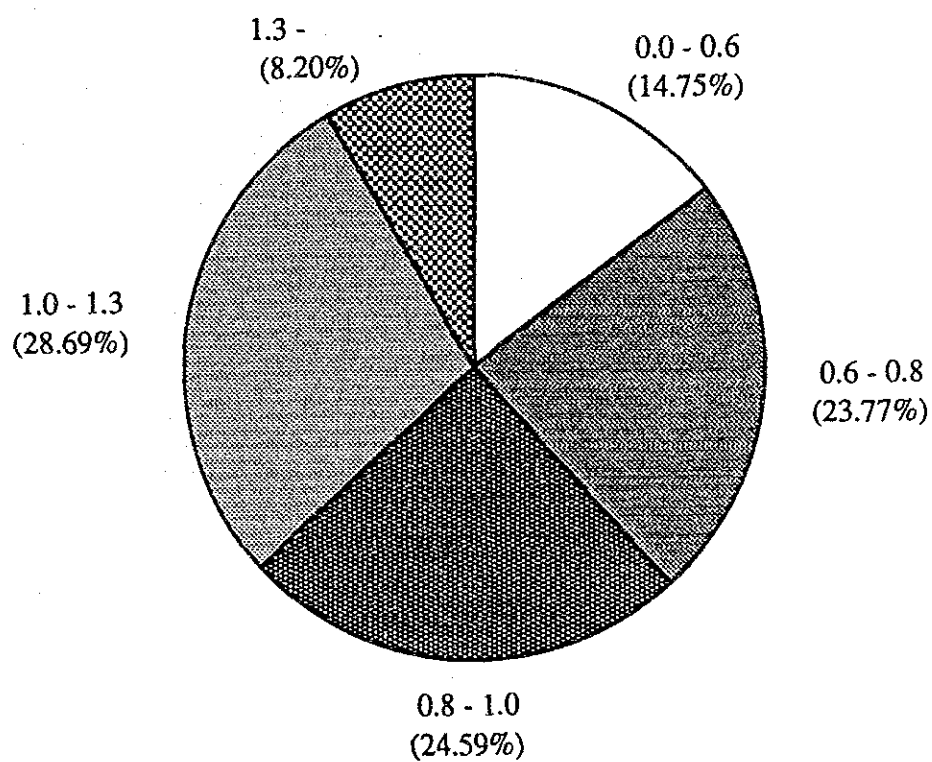




ネパール王国 カトマンズ地区送配電網拡張整備計画調査	NEPAL ELECTRICITY AUTHORITY	TITLE 図 4.3 月別遮断器動作回数
	国際協力事業団	



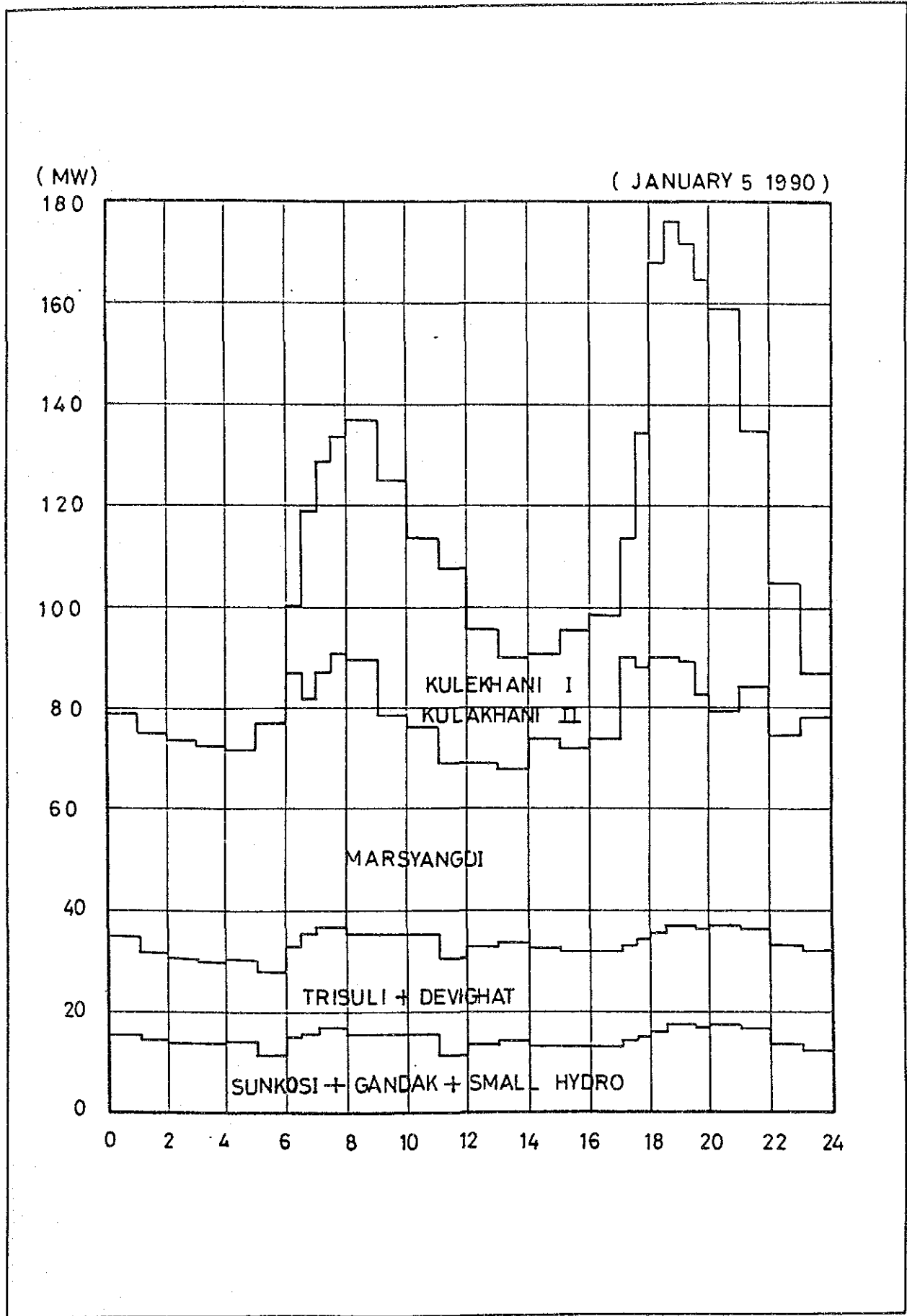




(Measured in Lalitpur Division in 1989/90)

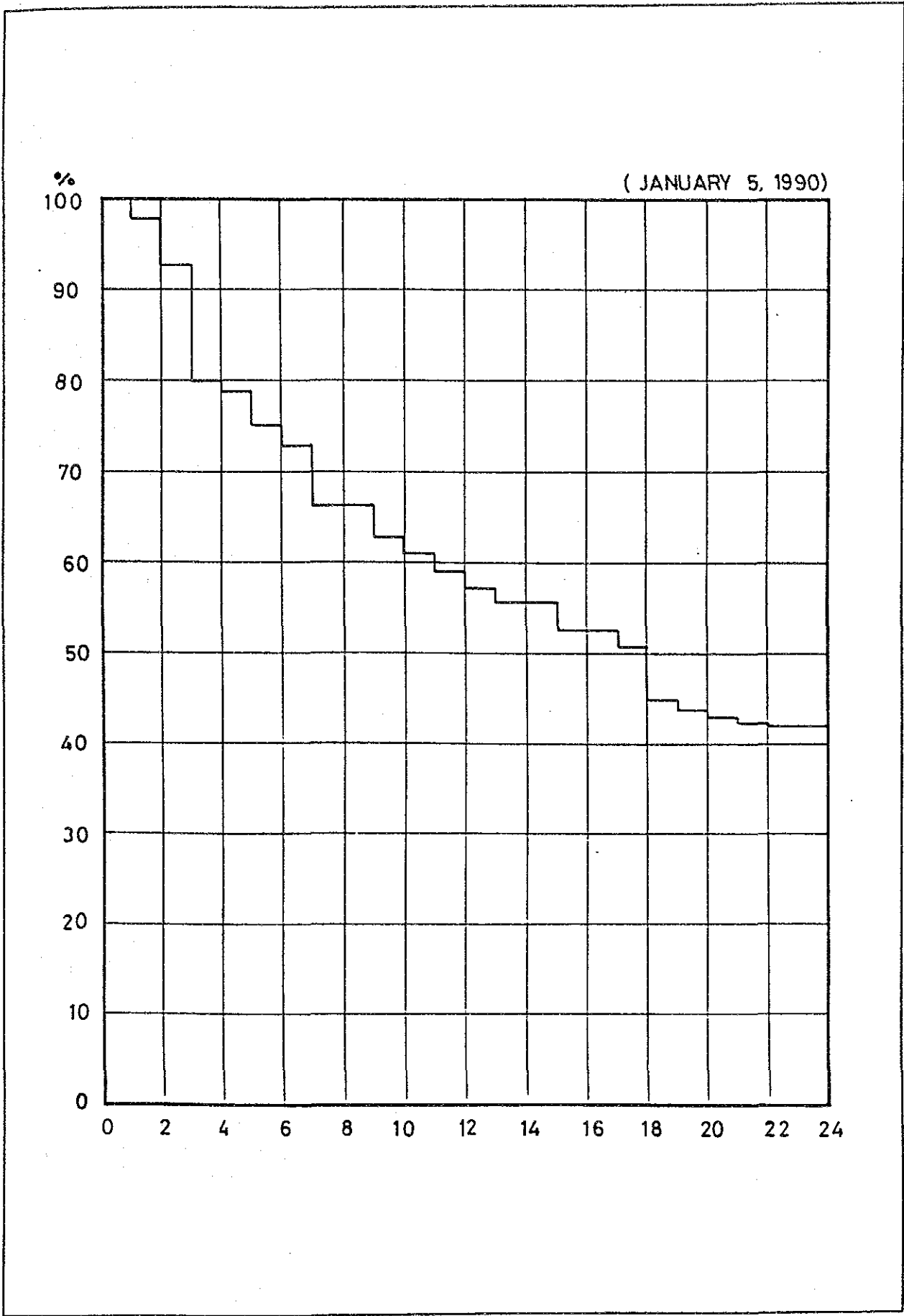
नेपाल王国 काठमांडू क्षेत्रीय वितरण तन्त्र विस्तार योजना	NEPAL ELECTRICITY AUTHORITY 国際協力事業団	TITLE 図 4.4 配電用変圧器の利用率分布
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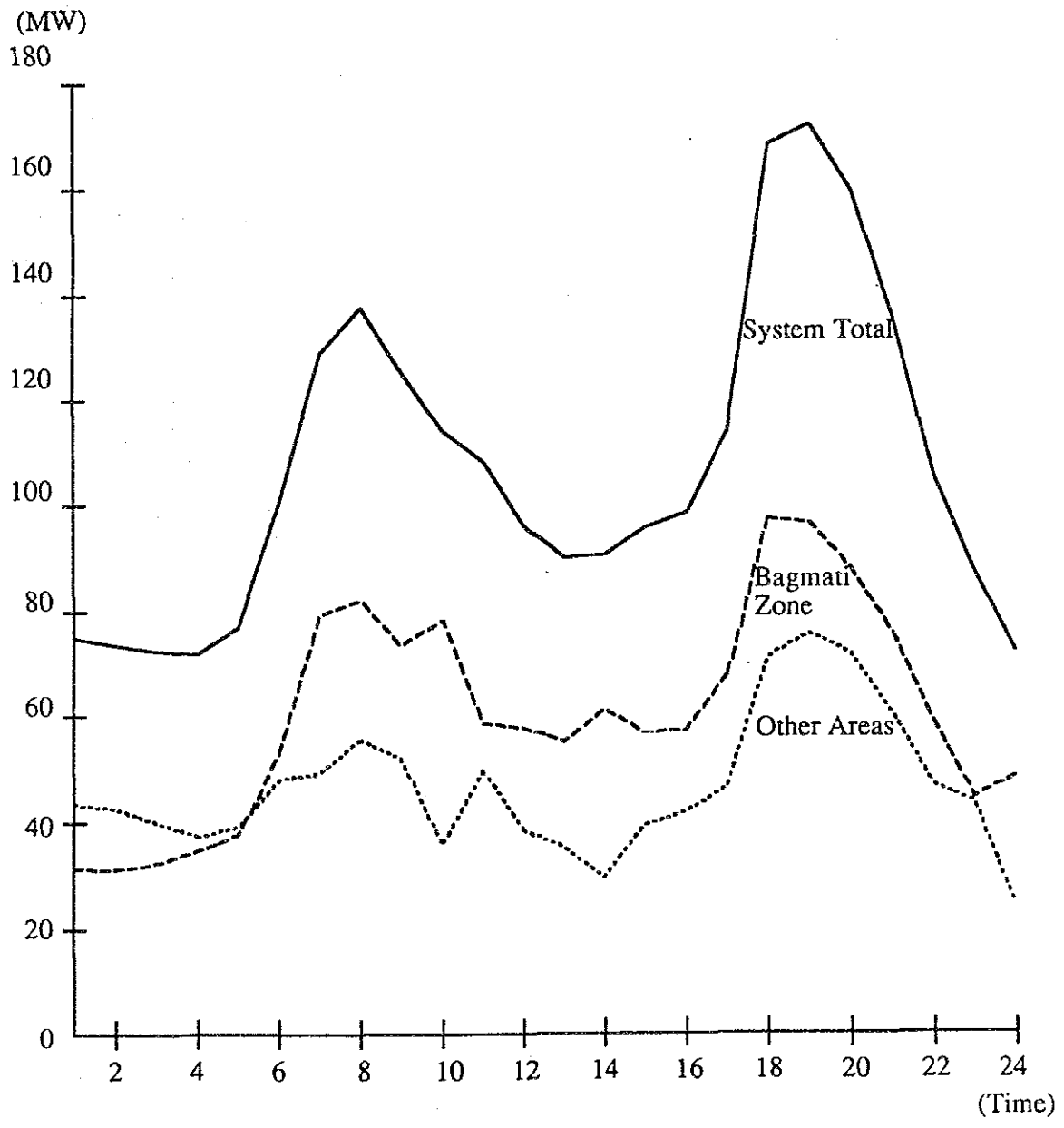
नेपाल王国 काठमांडू地区送配電網擴張整備計画調査	NEPAL ELECTRICITY AUTHORITY 国際協力事業団	TITLE 図 5.1 時間別発電所出力 (1990年1月5日)
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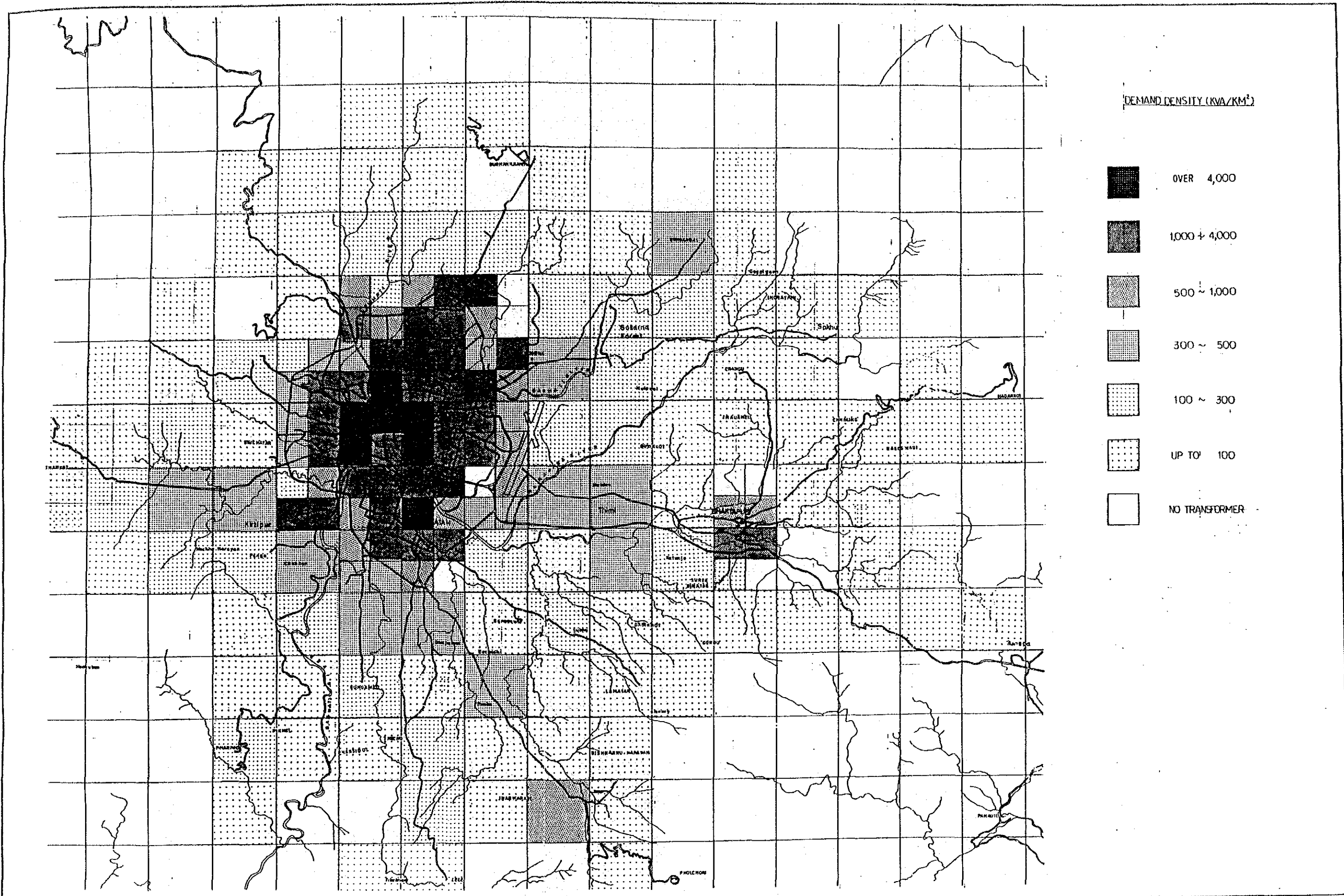
नेपाल王国 काठमांडू地区送配電網擴張整備計画調査	NEPAL ELECTRICITY AUTHORITY	TITLE 図 5.2 負荷持続曲線 (1990年1月5日)
	国際協力事業団	



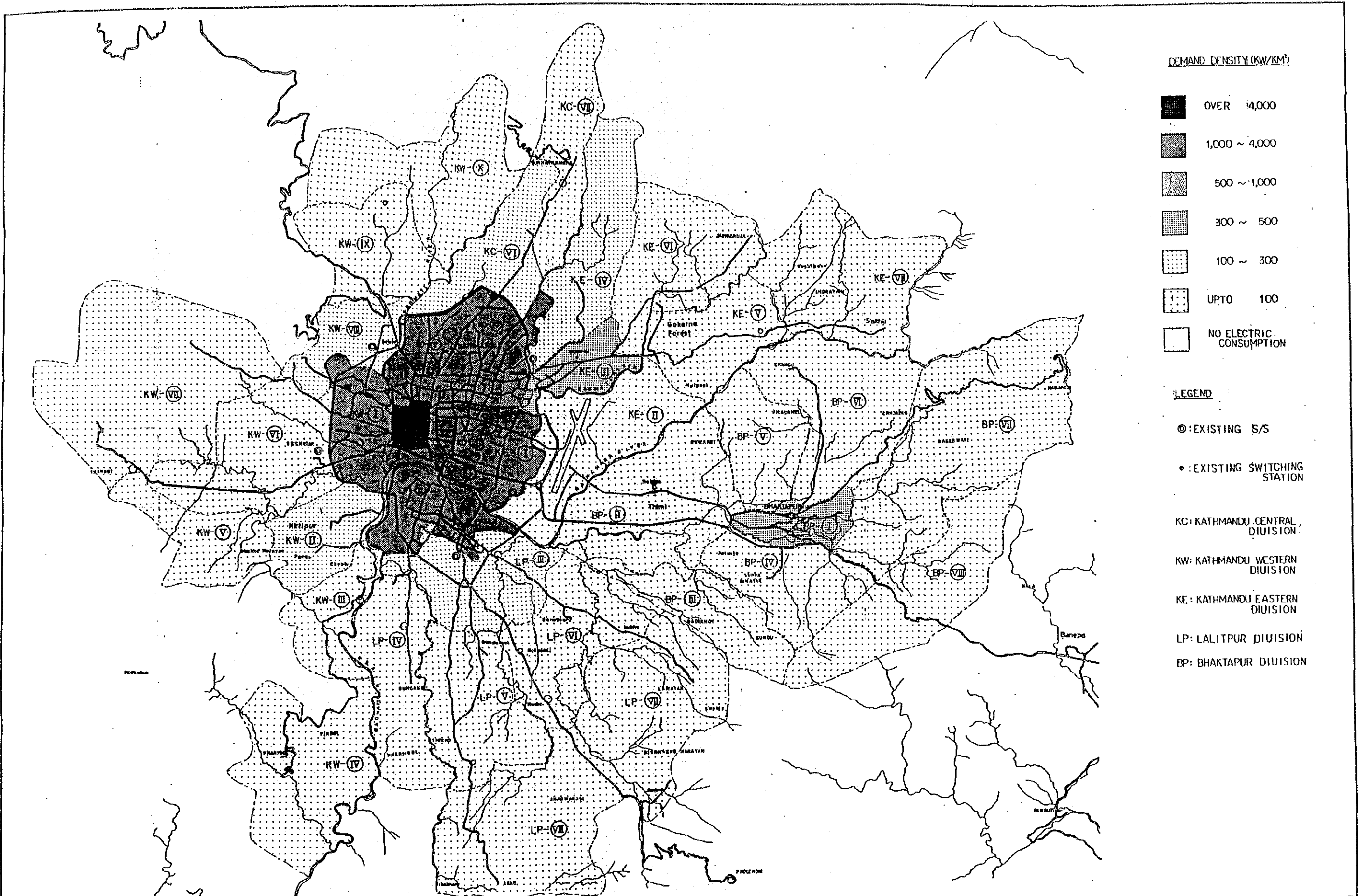


नेपाल王国 काठमांडू地区送配電網拡張整備計画調査	NEPAL ELECTRICITY AUTHORITY 国際協力事業団	TITLE 図 5.3 地域別負荷曲線 (1990年1月5日)
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








<p>ネパール王国 カトマンズ地区送配電網拡張整備計画調査</p>	<p>NEPAL ELECTRICITY AUTHORITY 国際協力事業団</p>	<p>TITLE 図 5.4 変圧器容量より算定した負荷密度分布</p>
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DEMAND DENSITY (KW/KM<sup>2</sup>)

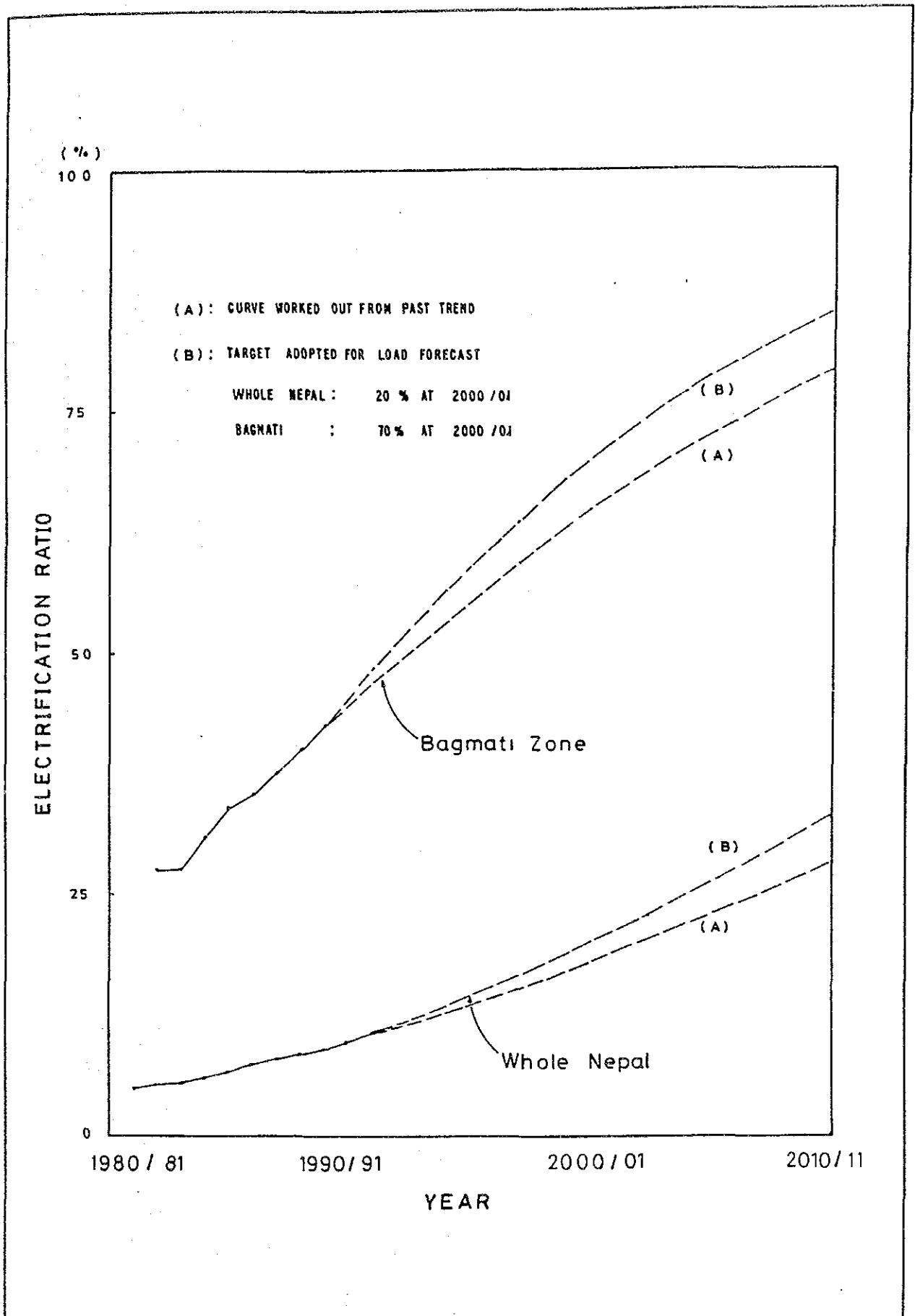
-  OVER 4,000
-  1,000 ~ 4,000
-  500 ~ 1,000
-  300 ~ 500
-  100 ~ 300
-  UPTO 100
-  NO ELECTRIC CONSUMPTION

LEGEND

-  : EXISTING S/S
-  : EXISTING SWITCHING STATION
- KC: KATHMANDU CENTRAL DIVISION
- KW: KATHMANDU WESTERN DIVISION
- KE: KATHMANDU EASTERN DIVISION
- LP: LALITPUR DIVISION
- BP: BHAKTAPUR DIVISION

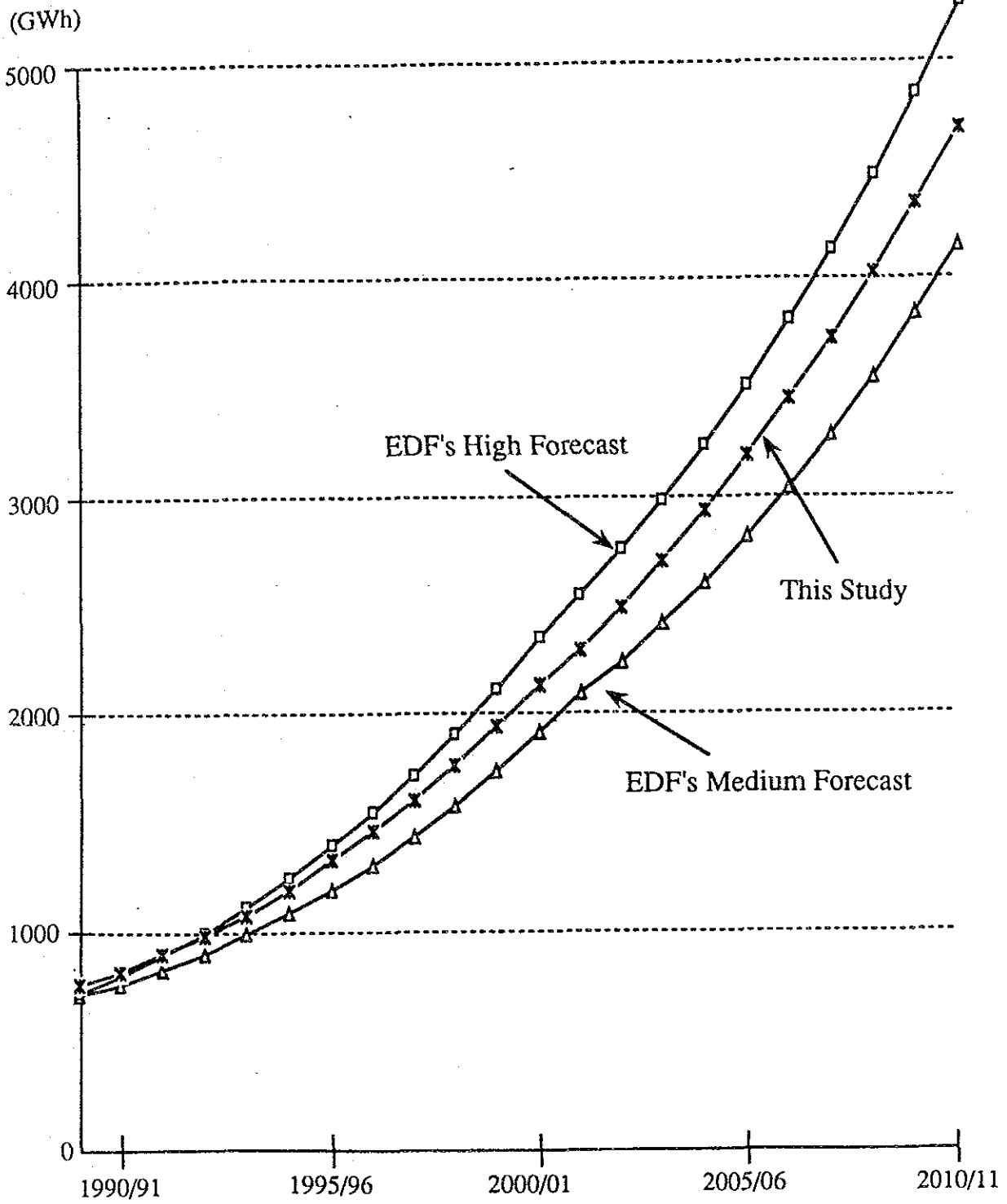
<p>ネパール王国 カトマंडウ地区送配電網拡張整備計画調査</p>	<p>NEPAL ELECTRICITY AUTHORITY 国際協力事業団</p>	<p>TITLE 図 5.5 電力料金徴収地域別負荷密度分布 (1989/90)</p>
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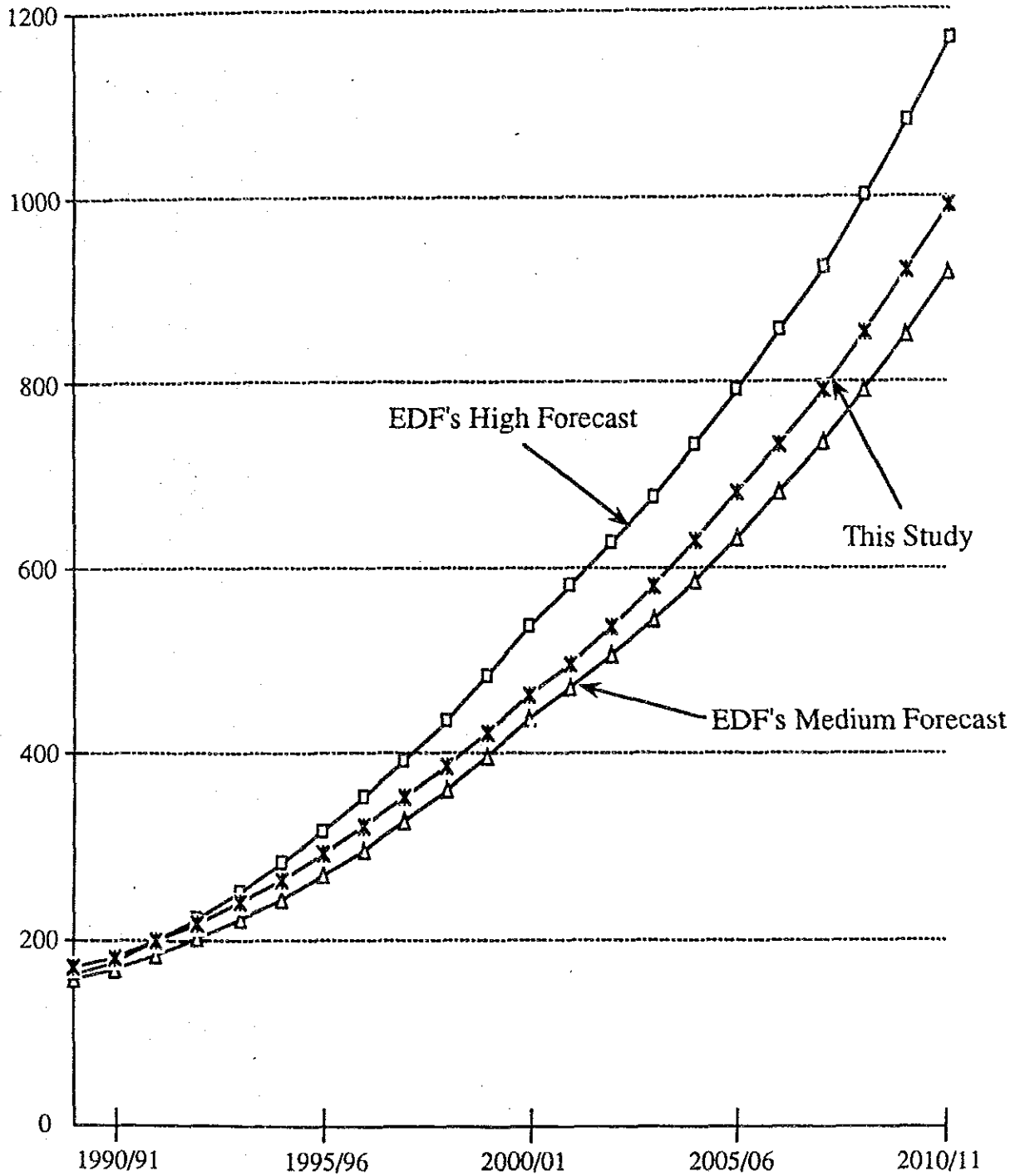
नेपाल王国 カトマンス地区送配電網拡張整備計画調査	NEPAL ELECTRICITY AUTHORITY 国際協力事業団	TITLE 図 6.1 電化率の予測曲線
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(MW)

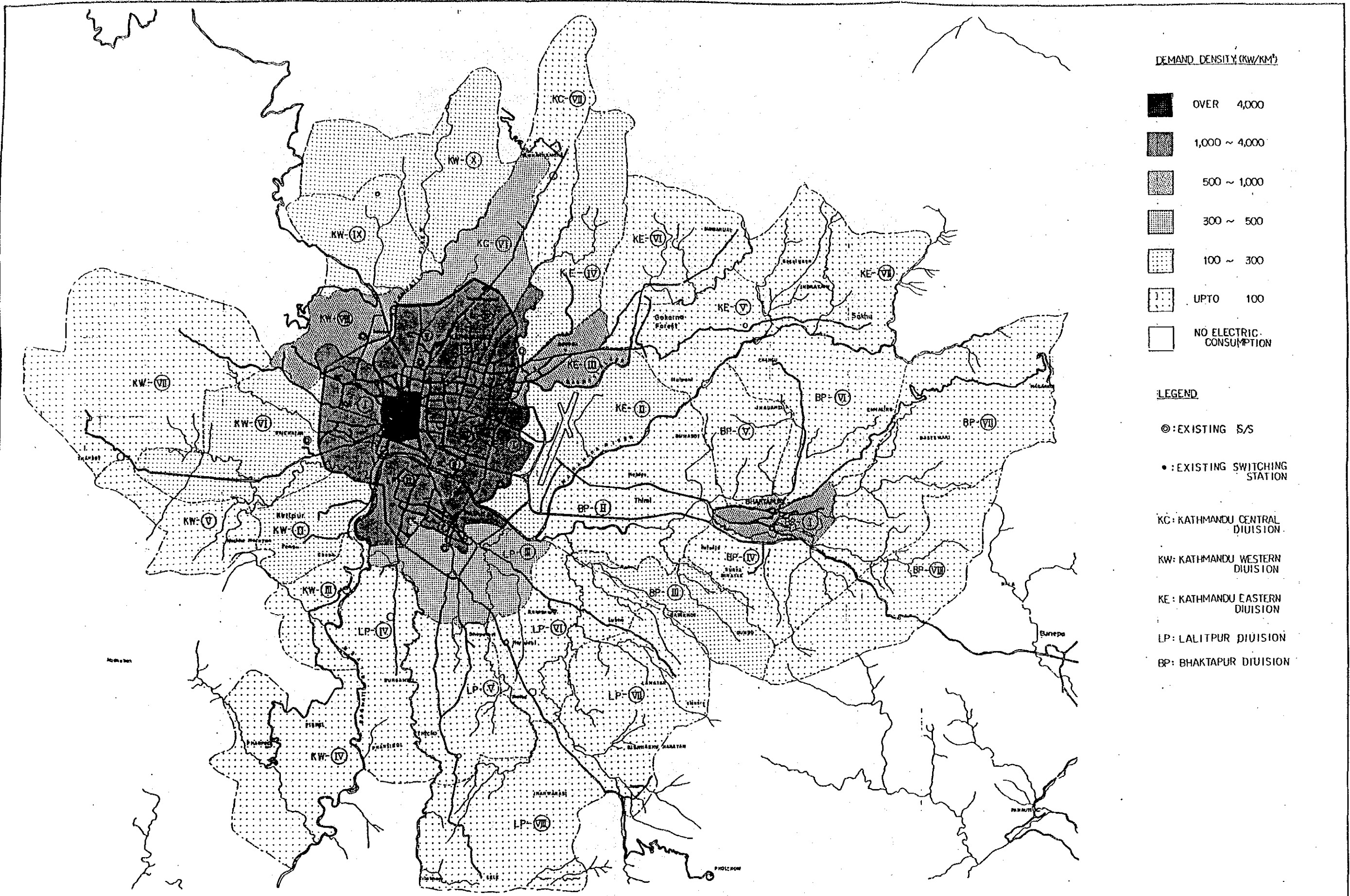


ネパール王国  
カトマンズ地区送配電網拡張整備計画調査

NEPAL ELECTRICITY AUTHORITY  
国際協力事業団

TITLE  
図 6.3  
最大負荷予測





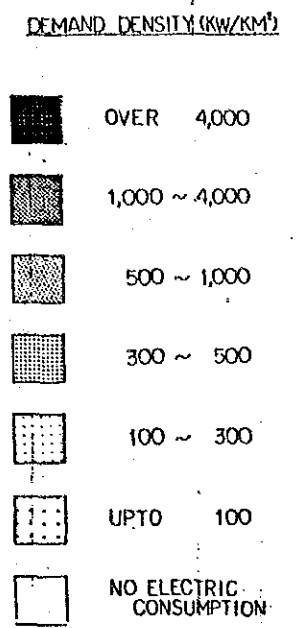
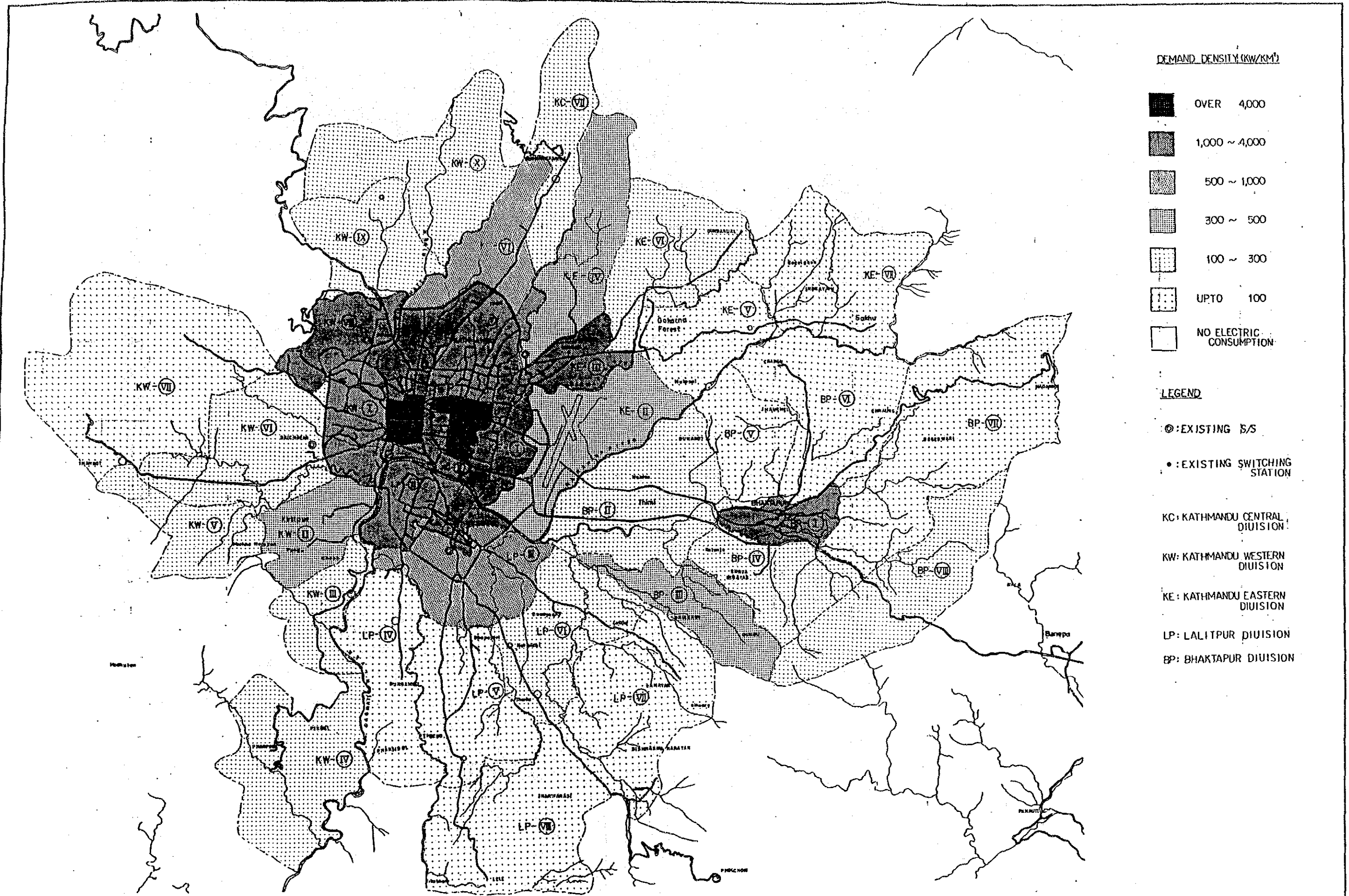
DEMAND DENSITY (KW/KM<sup>2</sup>)

- OVER 4,000
- 1,000 ~ 4,000
- 500 ~ 1,000
- 300 ~ 500
- 100 ~ 300
- UPTO 100
- NO ELECTRIC CONSUMPTION

LEGEND

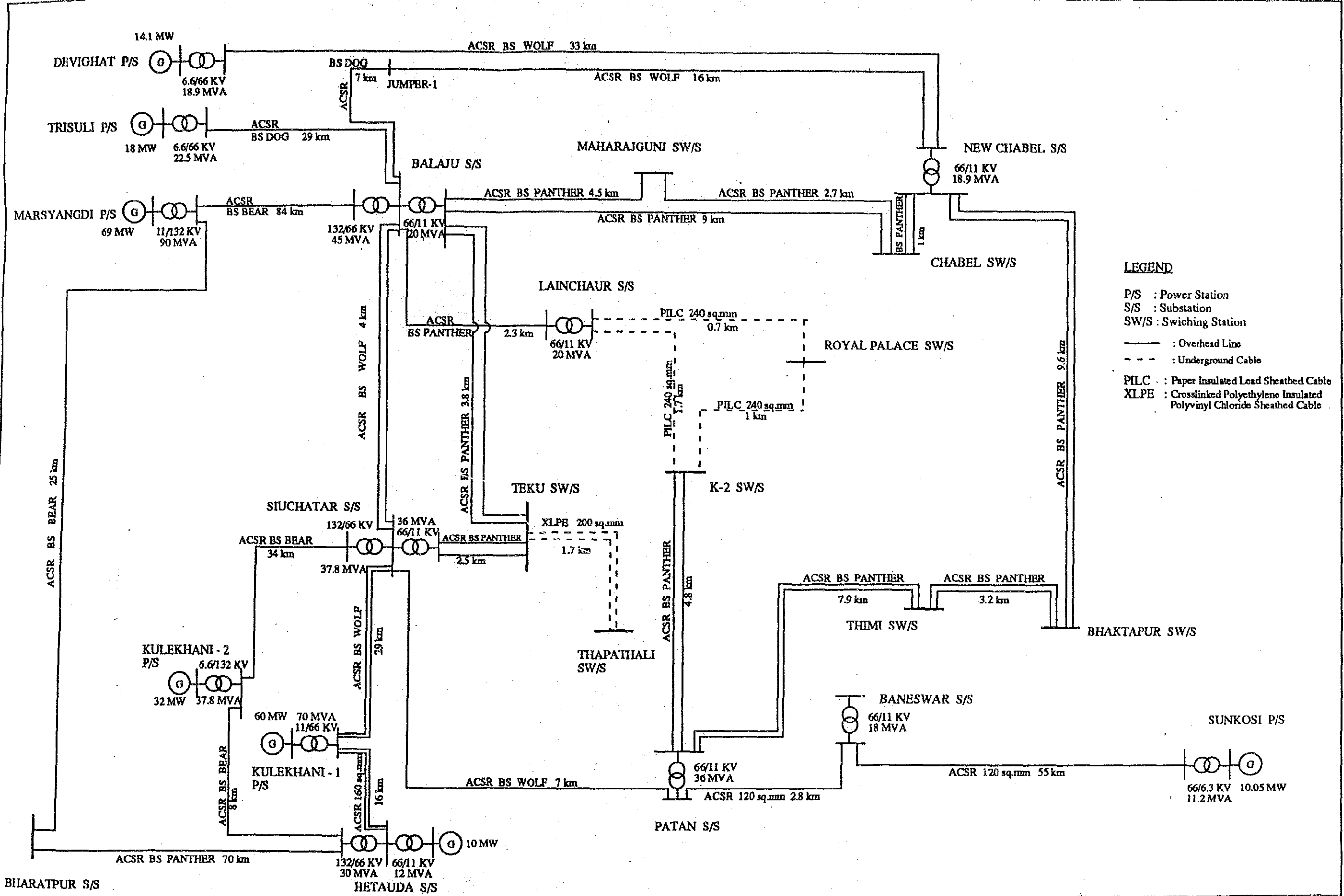
- ⊙ : EXISTING S/S
- : EXISTING SWITCHING STATION
- KC : KATHMANDU CENTRAL DIVISION
- KW : KATHMANDU WESTERN DIVISION
- KE : KATHMANDU EASTERN DIVISION
- LP : LALITPUR DIVISION
- BP : BHAKTAPUR DIVISION

<p>ネパール王国 カトマンズ地区送配電網拡張整備計画調査</p>	<p>NEPAL ELECTRICITY AUTHORITY 国際協力事業団</p>	<p>TITLE 図 6.4 電力料金徴収地域別負荷密度分布 (1995/96)</p>
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**LEGEND**

- ⊙: EXISTING S/S
- : EXISTING SWITCHING STATION
- KC: KATHMANDU CENTRAL DIVISION
- KW: KATHMANDU WESTERN DIVISION
- KE: KATHMANDU EASTERN DIVISION
- LP: LALITPUR DIVISION
- BP: BHAKTAPUR DIVISION

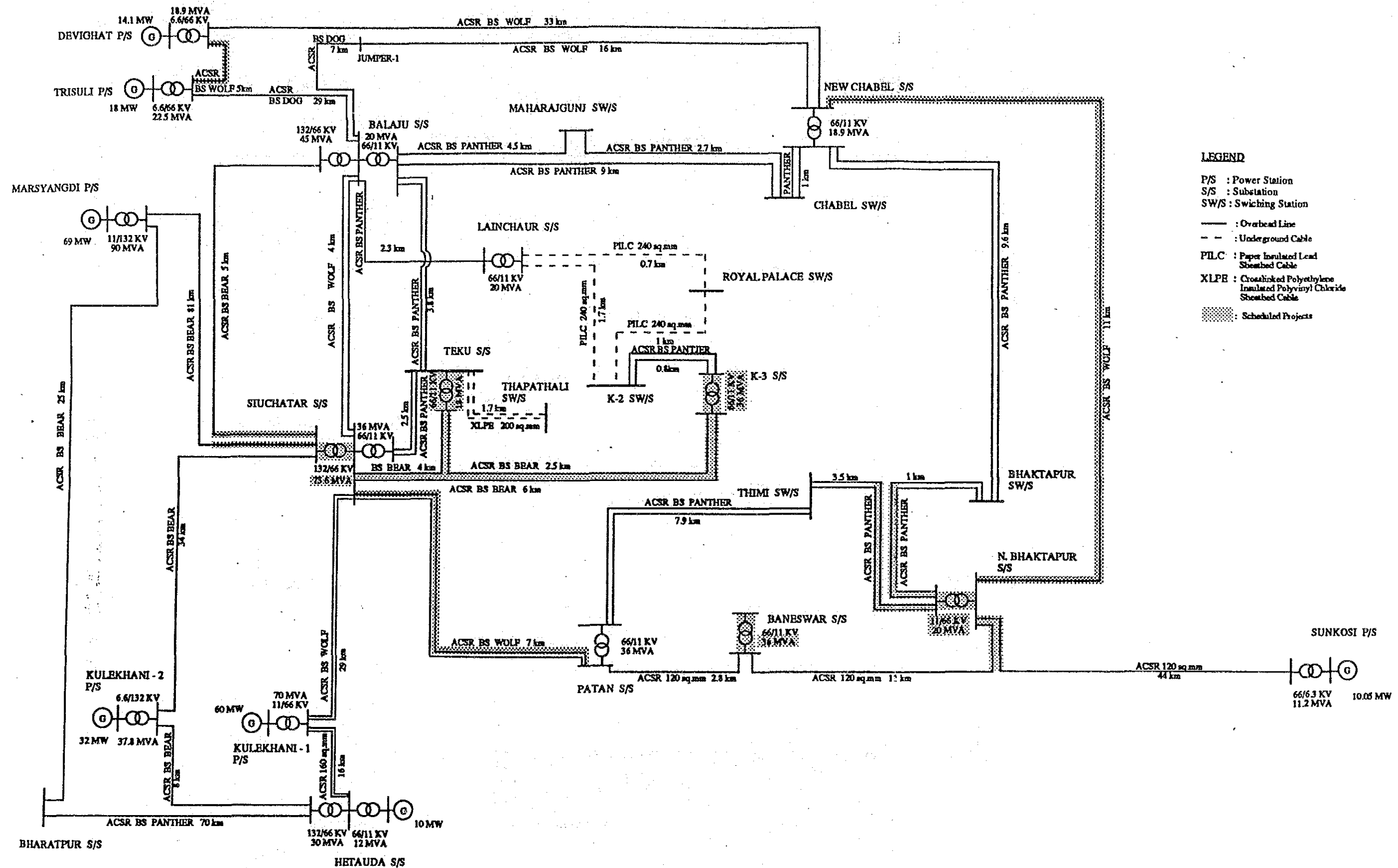


**LEGEND**

P/S : Power Station  
 S/S : Substation  
 SW/S : Switching Station

— : Overhead Line  
 - - - : Underground Cable

PILC : Paper Insulated Lead Sheathed Cable  
 XLPE : Crosslinked Polyethylene Insulated Polyvinyl Chloride Sheathed Cable



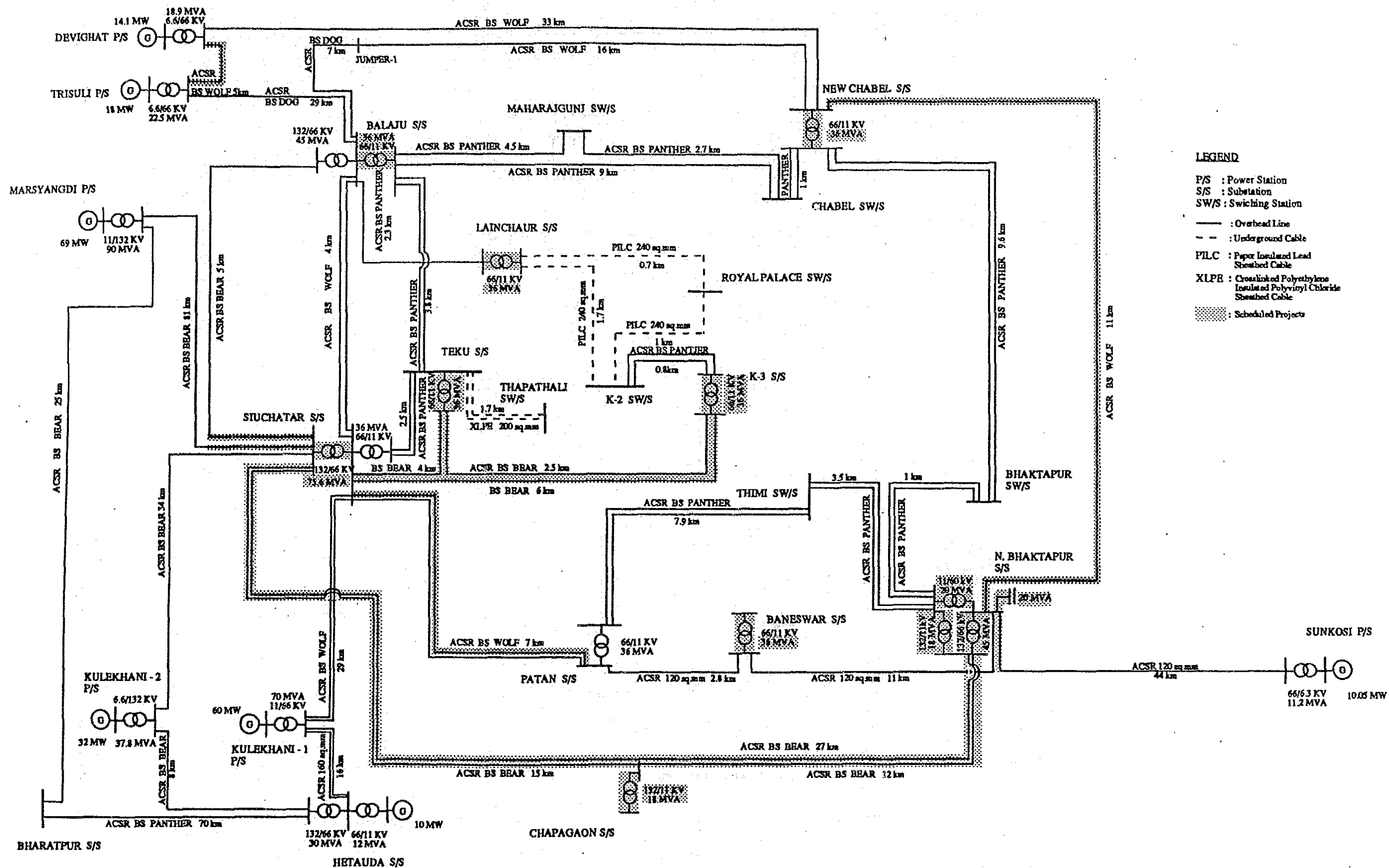
**LEGEND**

P/S : Power Station  
 S/S : Substation  
 SW/S : Switching Station

— : Overhead Line  
 - - : Underground Cable

PILC : Paper Insulated Lead Sheathed Cable  
 XLPE : Crosslinked Polyethylene Insulated Polyvinyl Chloride Sheathed Cable

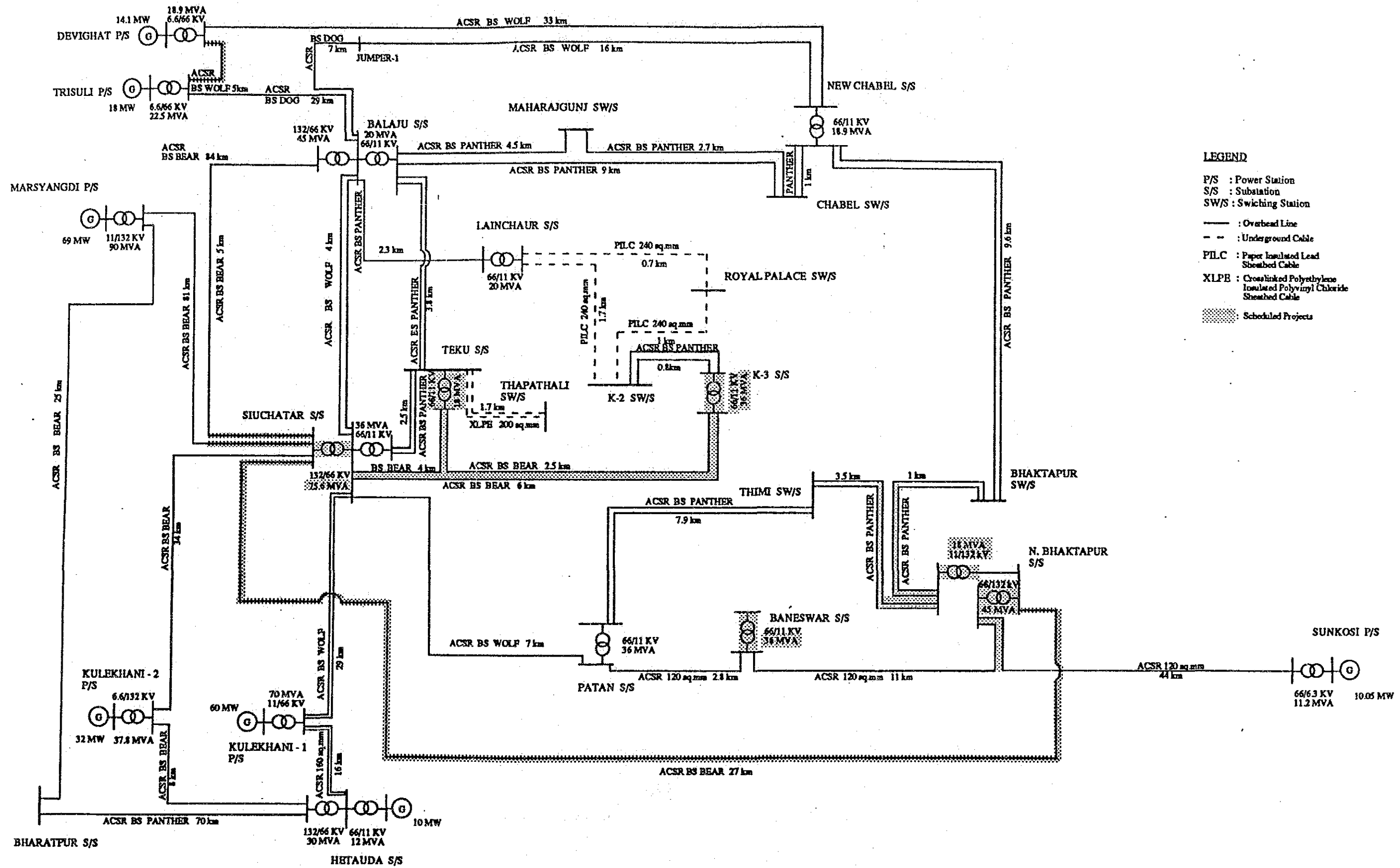
▨ : Scheduled Projects



**LEGEND**

- P/S : Power Station
- S/S : Substation
- SW/S : Switching Station
- : Overhead Line
- - - : Underground Cable
- PILC : Paper Insulated Lead Sheathed Cable
- XLPE : Crosslinked Polyethylene Insulated Polyvinyl Chloride Sheathed Cable
- ▨ : Scheduled Projects

नेपाल王国 काठमान्डु地区送配電網拡張整備計画調査	NEPAL ELECTRICITY AUTHORITY 国際協力事業団	TITLE 図 7.3 シナリオ-Aの2000/01年系統図
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**LEGEND**

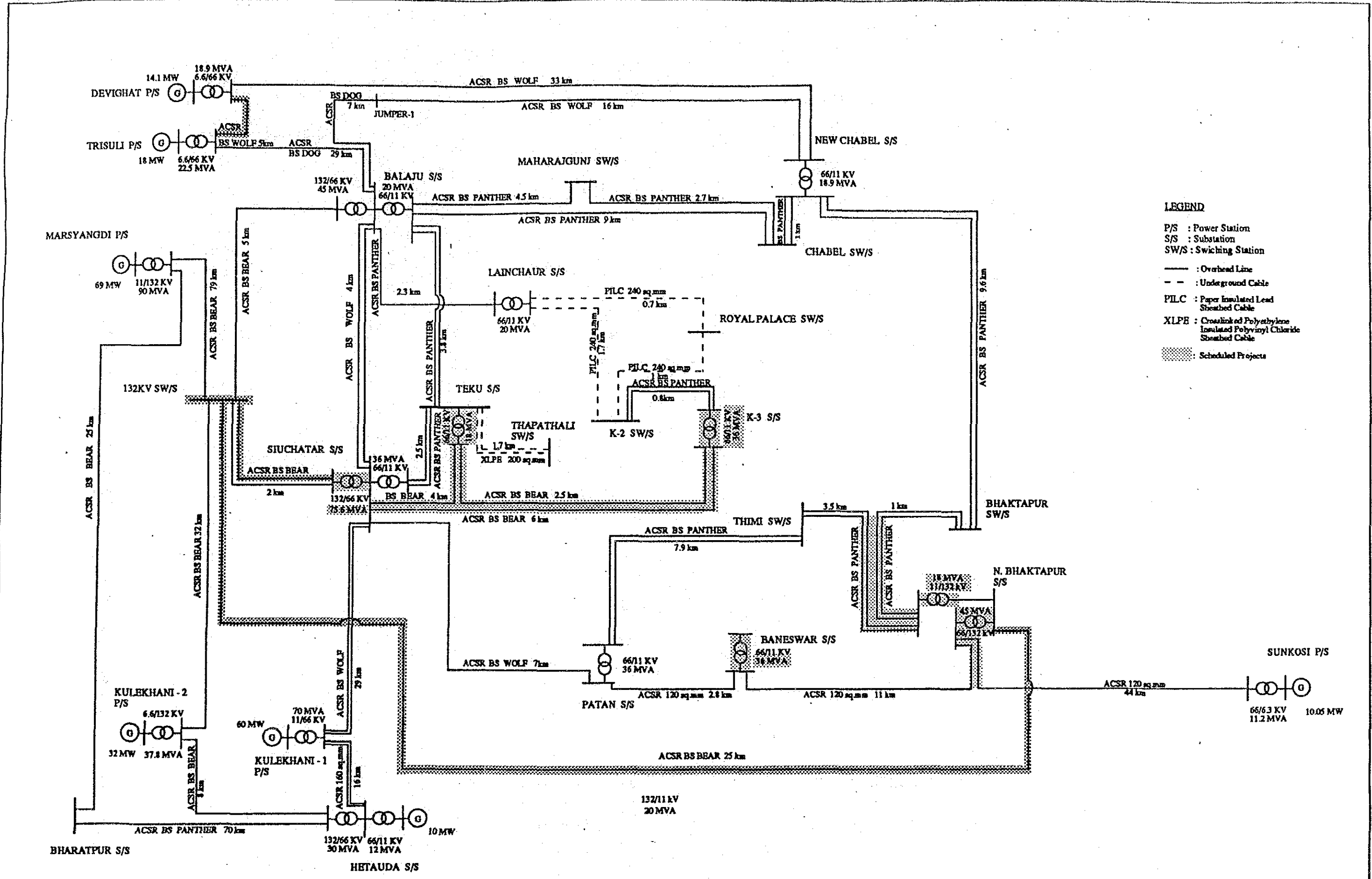
P/S : Power Station  
 S/S : Substation  
 SW/S : Switching Station

— : Overhead Line  
 - - : Underground Cable

PILC : Paper Insulated Lead Sheathed Cable  
 XLPE : Crosslinked Polyethylene Insulated Polyvinyl Chloride Sheathed Cable

▨ : Scheduled Projects

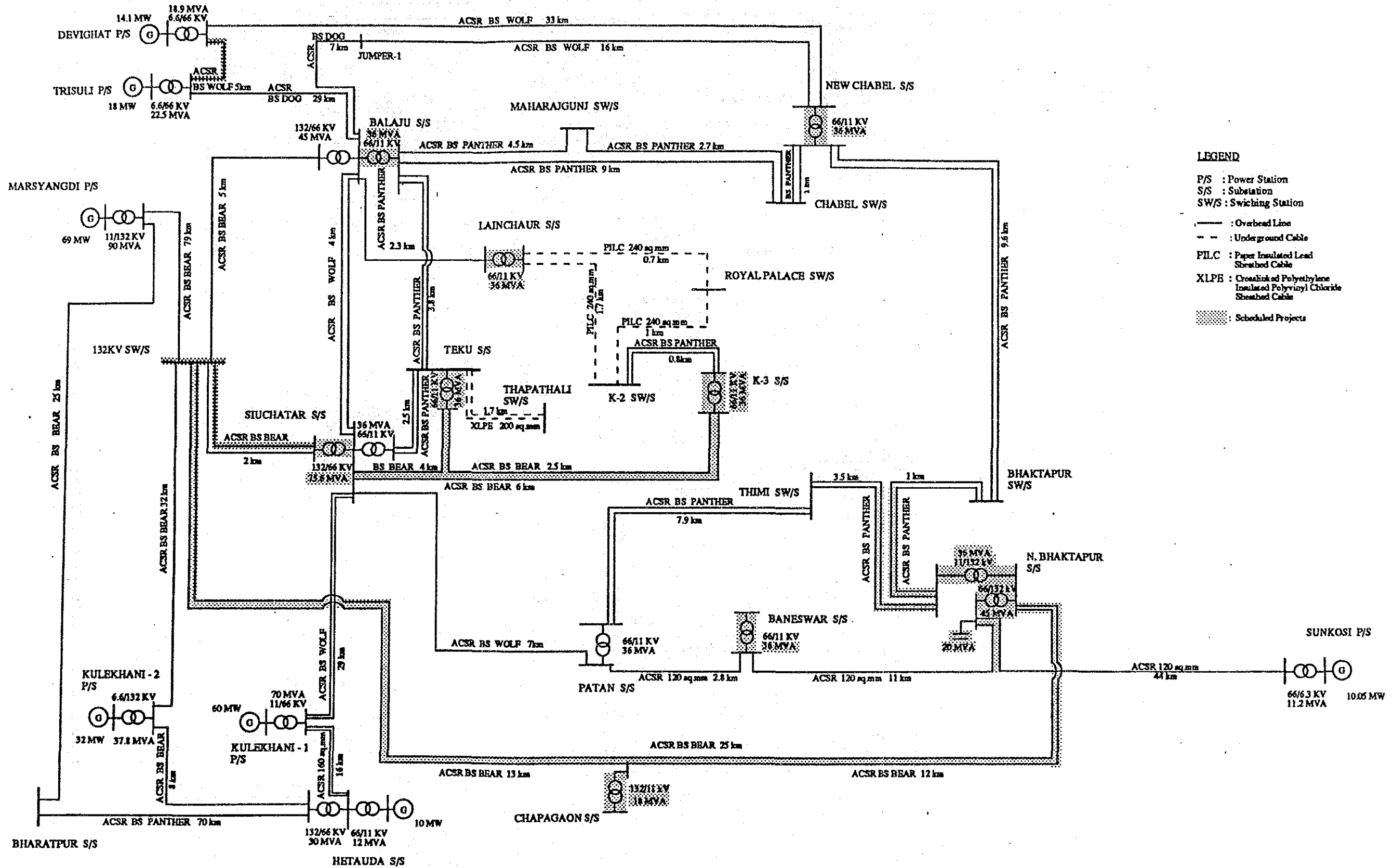


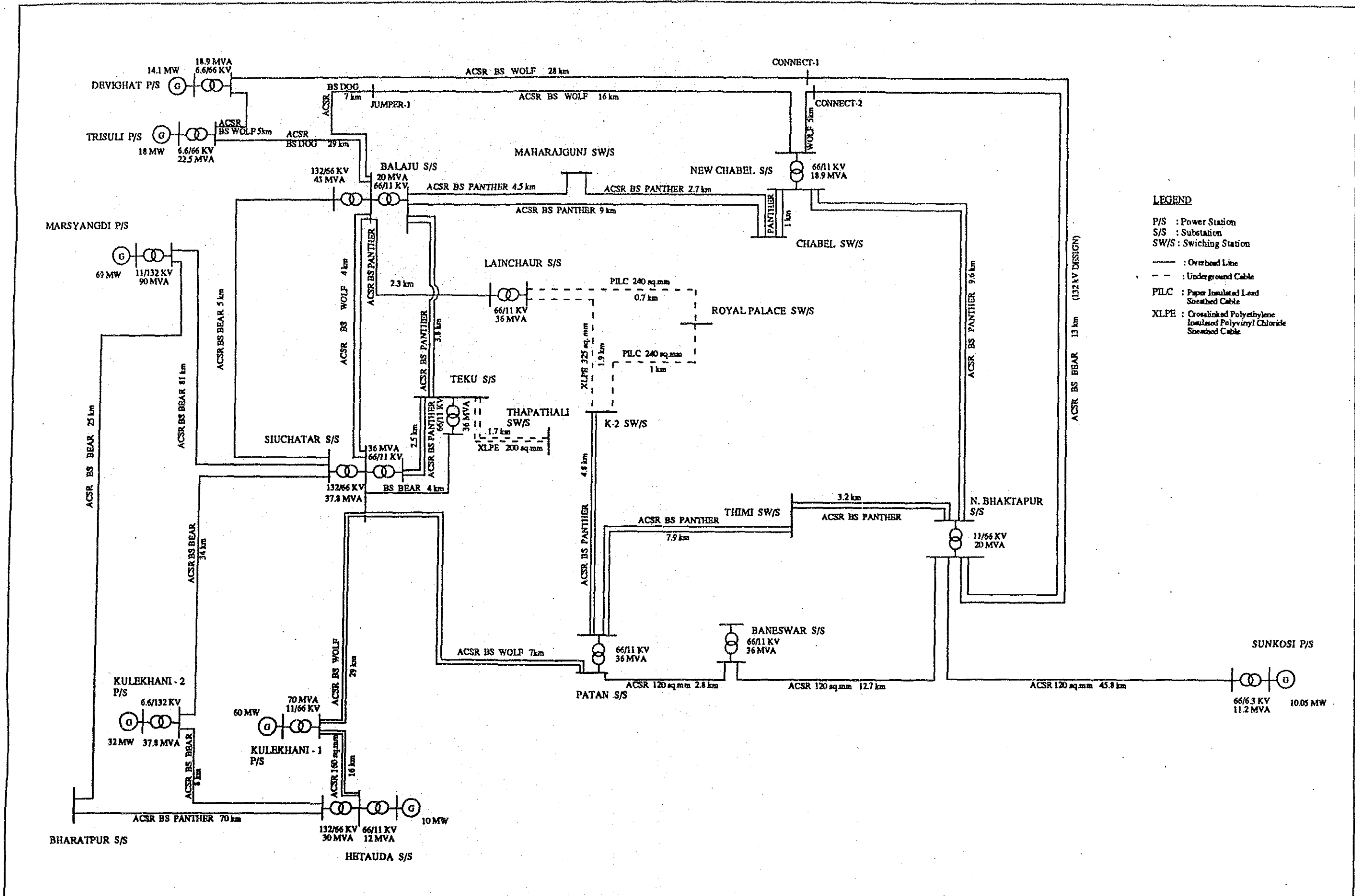


**LEGEND**

- P/S : Power Station
- S/S : Substation
- SW/S : Switching Station
- : Overhead Line
- - : Underground Cable
- PILC : Paper Insulated Lead Sheathed Cable
- XLPE : Crosslinked Polyethylene Insulated Polyvinyl Chloride Sheathed Cable
- ▨ : Scheduled Projects





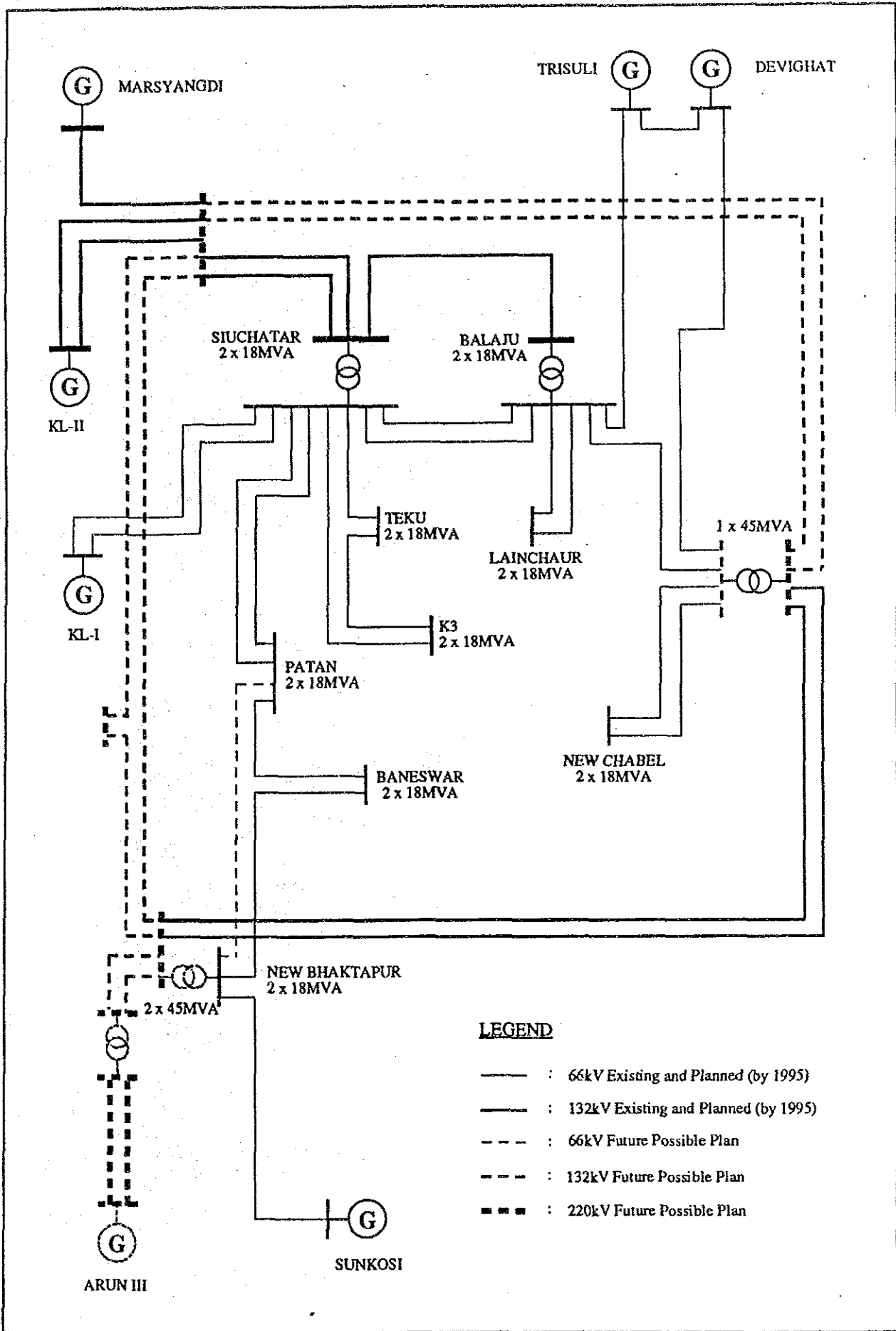


**LEGEND**

- P/S : Power Station
- S/S : Substation
- SW/S : Switching Station
- : Overhead Line
- - : Under ground Cable
- PILC : Paper Insulated Lead Sheathed Cable
- XLPE : Crosslinked Polyethylene Insulated Polyvinyl Chloride Sheathed Cable

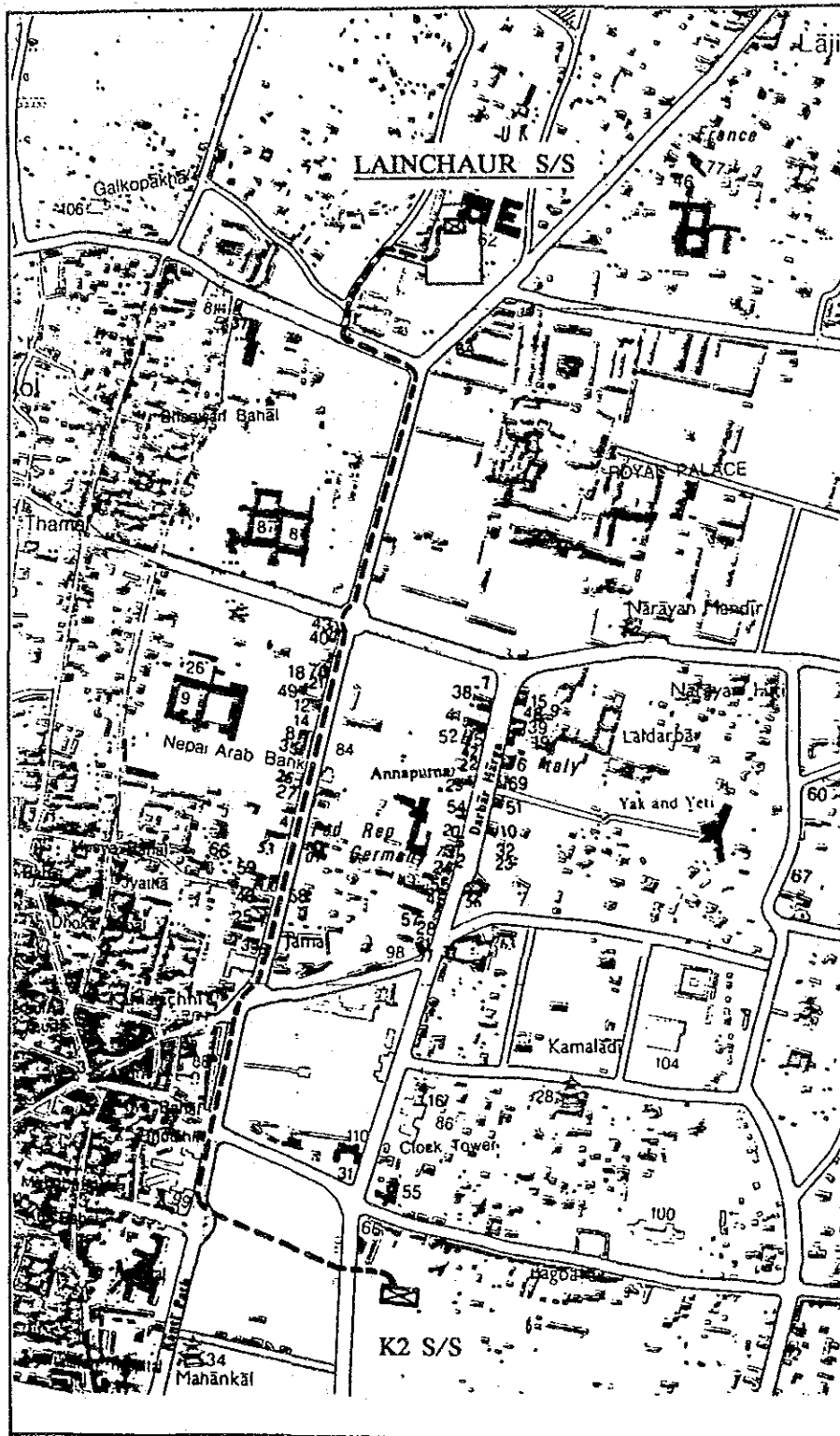
<p>ネパール王国 カトマंडウ地区送配電網拡張整備計画調査</p>	<p>NEPAL ELECTRICITY AUTHORITY 国際協力事業団</p>	<p>TITLE 図 11.1 送電線およびリングメイン配電線の単線結線図</p>
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नेपाल王国 カトマンズ地区送配電網拡張整備計画調査	NEPAL ELECTRICITY AUTHORITY 国際協力事業団	TITLE 図 11.2 カトマンズ地区の予想される将来の電力 供給系統
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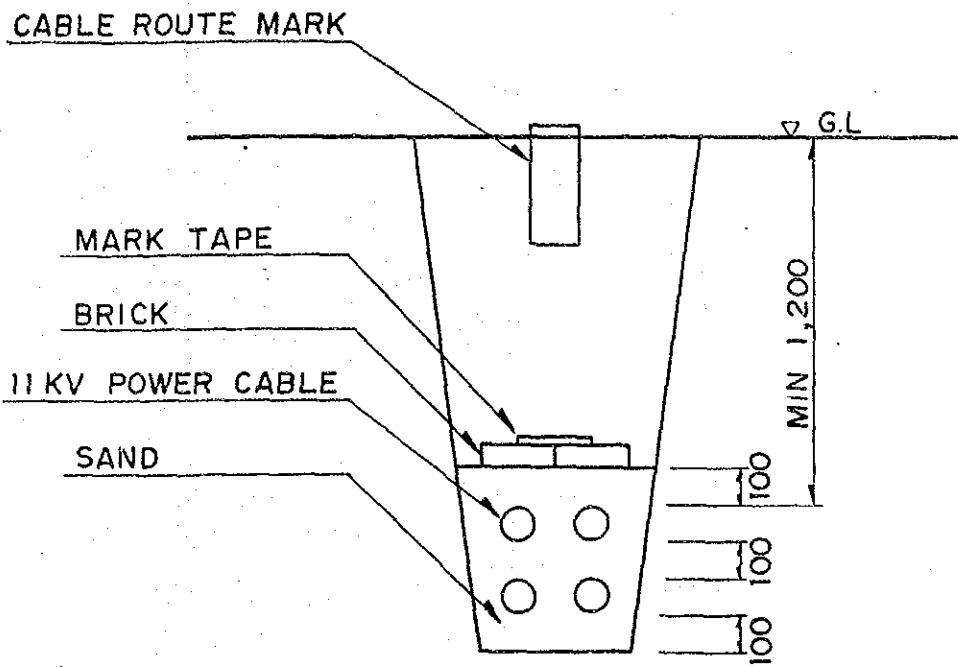




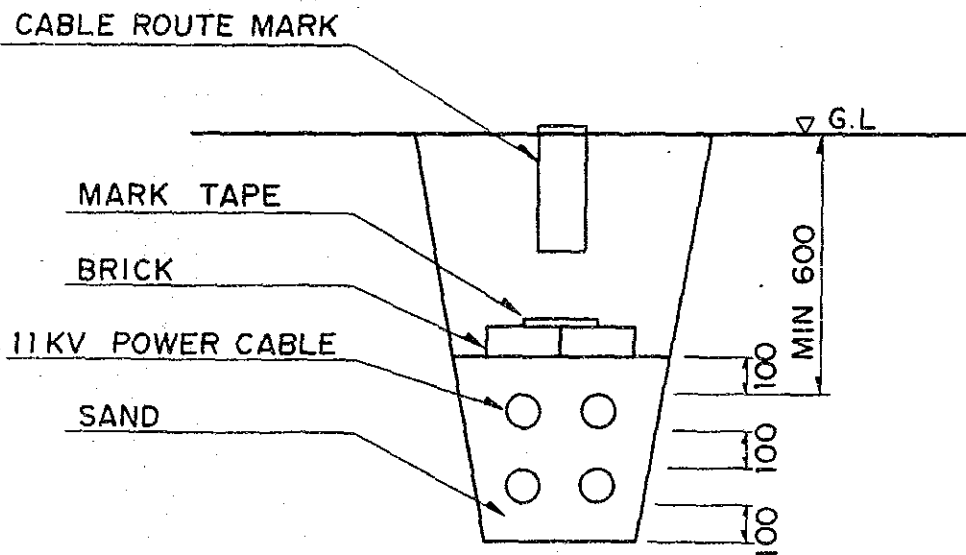
----- : 11kv Underground Cable Line Route

<p>ネパール王国 カトマンズ地区送配電網拡張整備計画調査</p>	<p>NEPAL ELECTRICITY AUTHORITY 国際協力事業団</p>	<p>TITLE 図 11.3 ラインチョール、K2間の11kV地中線の ルート図</p>
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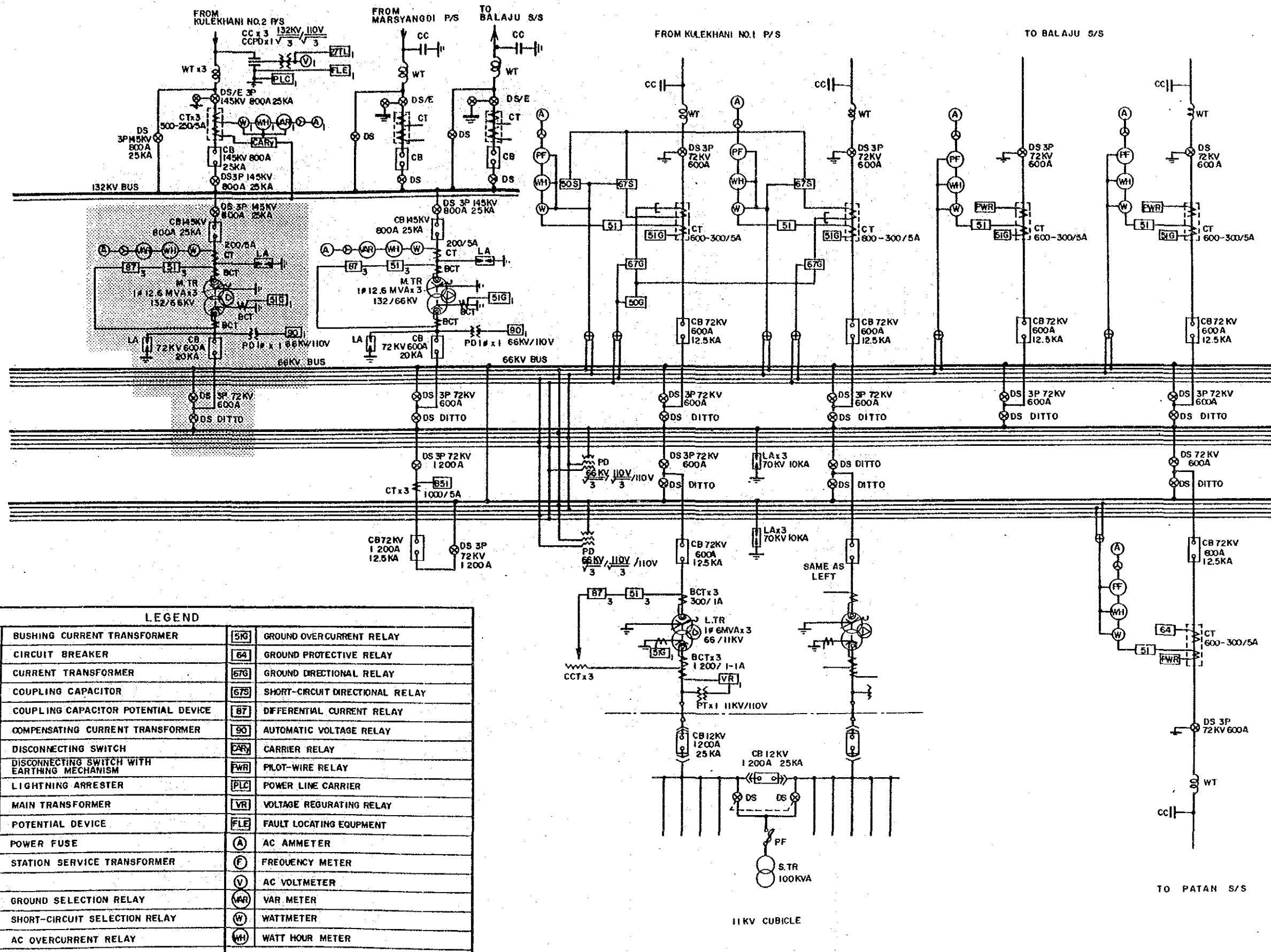
ALONG ROAD



GENERAL TERRAIN

नेपाल王国 काठमांडू地区送配電網擴張整備計画調査	NEPAL ELECTRICITY AUTHORITY 国際協力事業団	TITLE 図 11.4 ケーブル布設図
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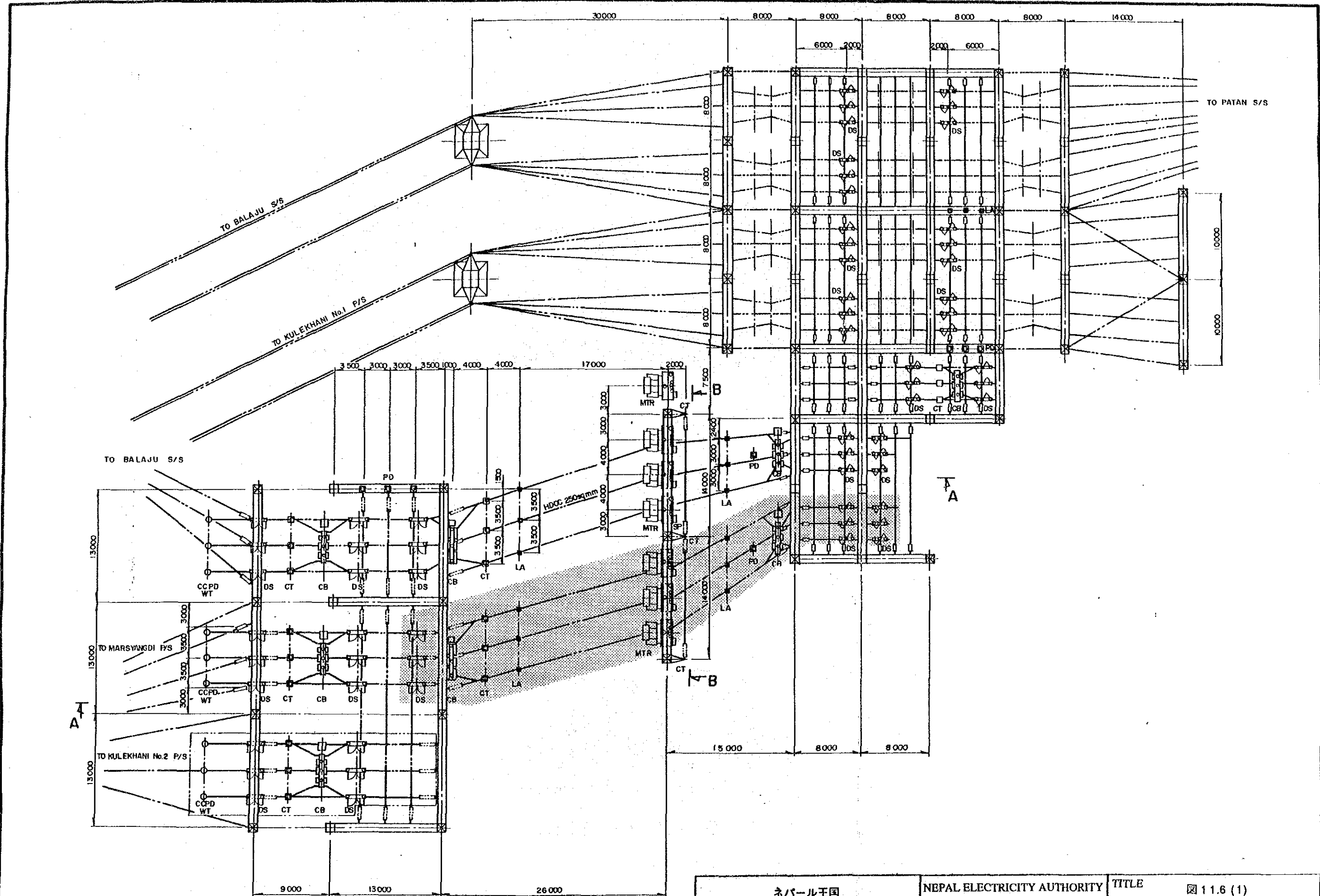





LEGEND			
BCT	BUSHING CURRENT TRANSFORMER	51G	GROUND OVERCURRENT RELAY
CB	CIRCUIT BREAKER	64	GROUND PROTECTIVE RELAY
CT	CURRENT TRANSFORMER	67G	GROUND DIRECTIONAL RELAY
CC	COUPLING CAPACITOR	67S	SHORT-CIRCUIT DIRECTIONAL RELAY
CCPD	COUPLING CAPACITOR POTENTIAL DEVICE	87	DIFFERENTIAL CURRENT RELAY
CCT	COMPENSATING CURRENT TRANSFORMER	90	AUTOMATIC VOLTAGE RELAY
DS	DISCONNECTING SWITCH	CAR	CARRIER RELAY
DS/E	DISCONNECTING SWITCH WITH EARTHING MECHANISM	FWR	PILOT-WIRE RELAY
LA	LIGHTNING ARRESTER	PLC	POWER LINE CARRIER
MTR	MAIN TRANSFORMER	VR	VOLTAGE REGULATING RELAY
PD	POTENTIAL DEVICE	FLE	FAULT LOCATING EQUIPMENT
PF	POWER FUSE	A	AC AMMETER
S.TR	STATION SERVICE TRANSFORMER	F	FREQUENCY METER
		V	AC VOLTMETER
		VAR	VAR METER
		W	WATTMETER
		WH	WATT HOUR METER
50G	GROUND SELECTION RELAY		
50S	SHORT-CIRCUIT SELECTION RELAY		
51	AC OVERCURRENT RELAY		

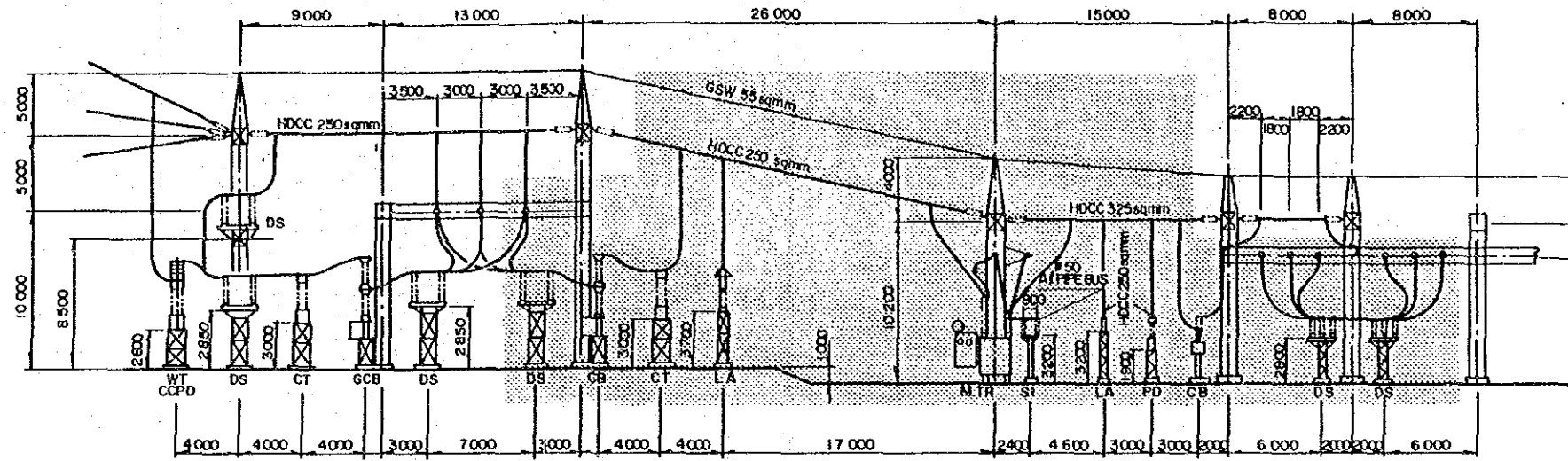
: Works under the Project

図 11.5

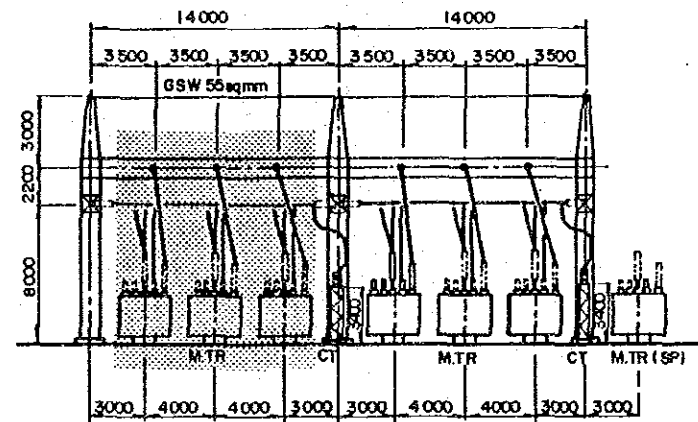


 : Works under the Project


नेपाल王国 काठमांडू地区送配電網拡張整備計画調査	NEPAL ELECTRICITY AUTHORITY 国際協力事業団	TITLE 図 11.6 (1) シウチャール変電所屋外開閉機器 配置図
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SECTION A - A

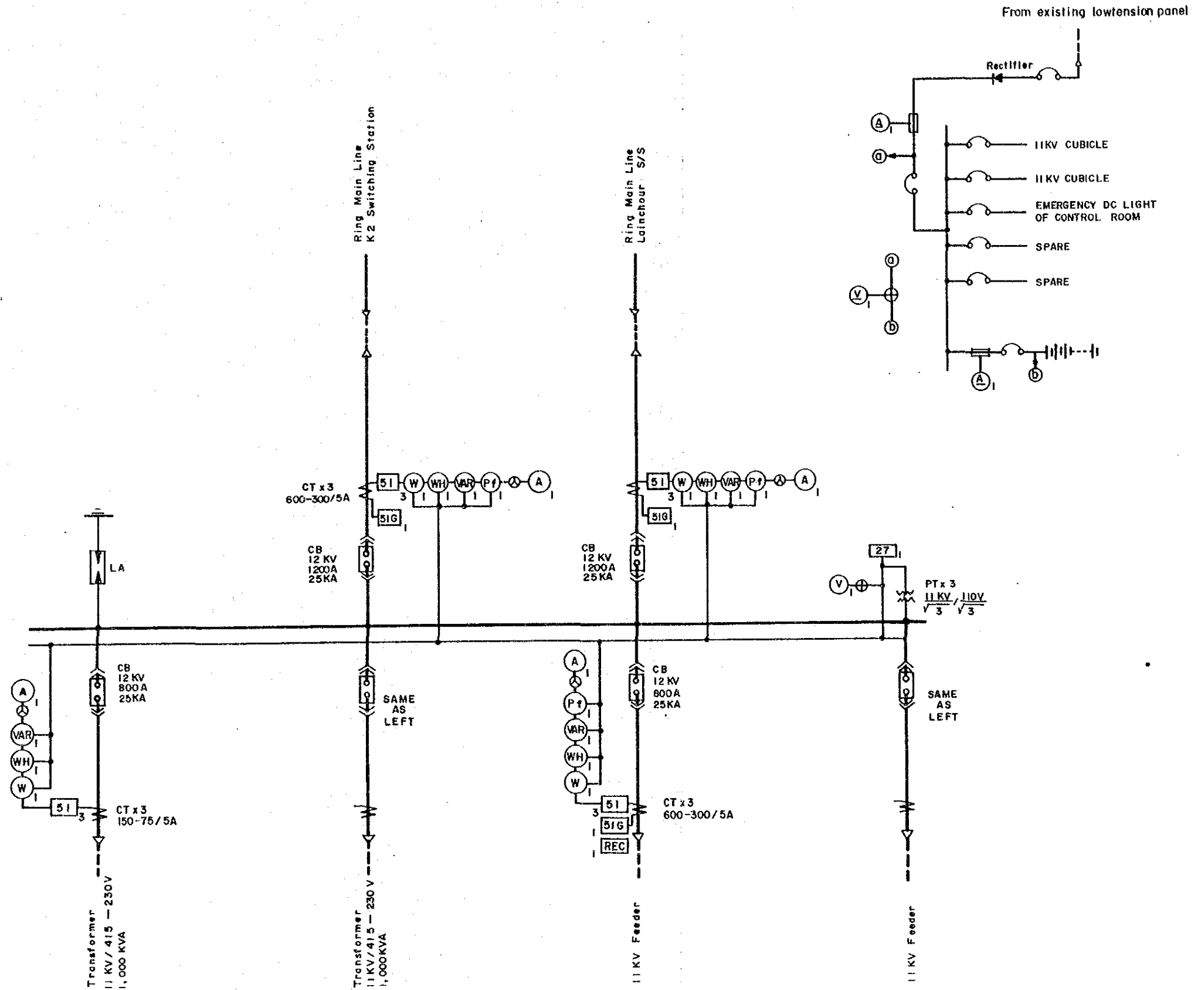


SECTION B - B

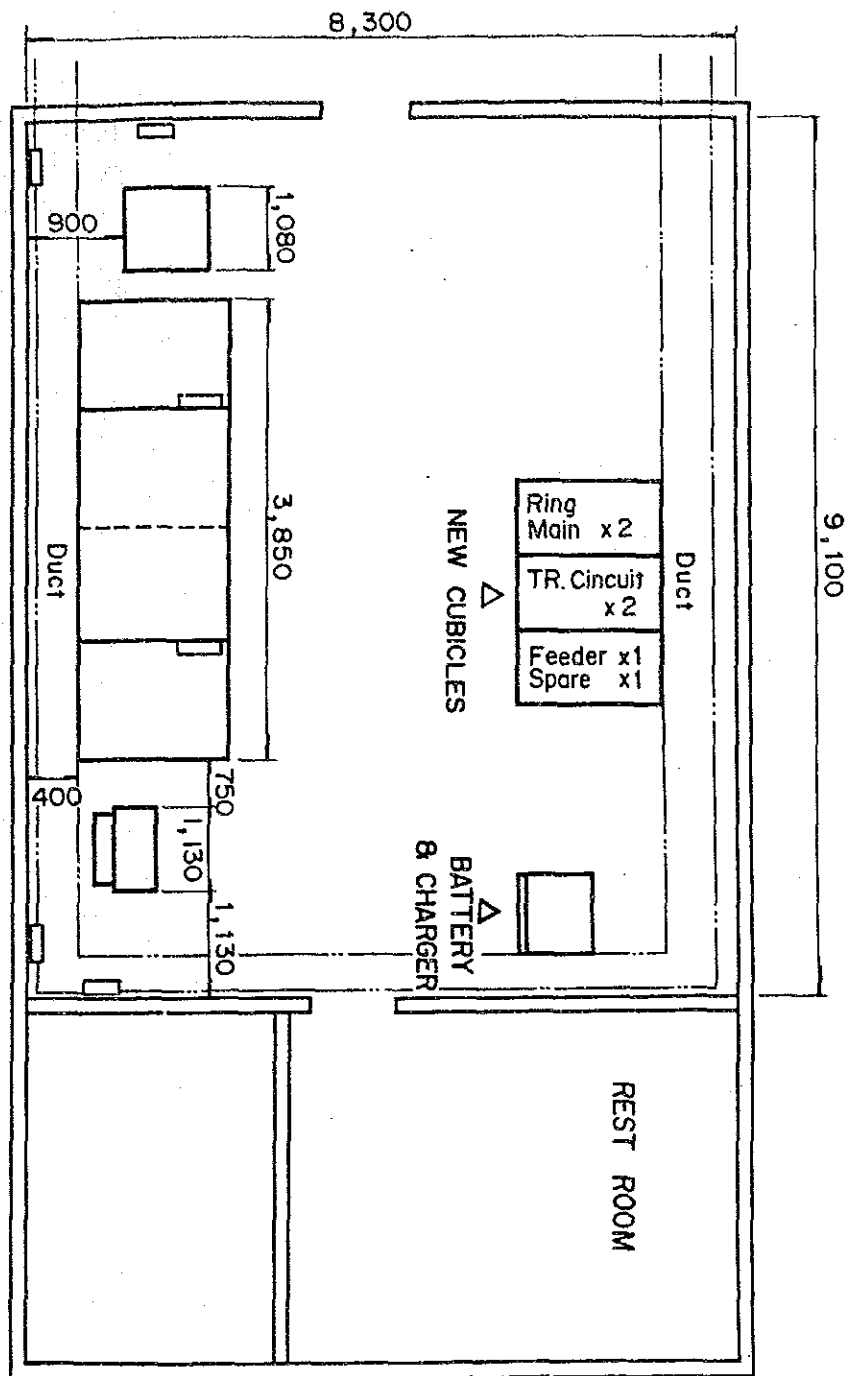
 : Works under the Project

नेपाल王国 काठमान्डु地区送配電網拡張整備計画調査	NEPAL ELECTRICITY AUTHORITY 国際協力事業団	TITLE 図 11.6 (2) シウチャール変電所屋外開閉機器 配置図
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LEGEND	
BCT	BUSHING CURRENT TRANSFORMER
CB	CIRCUIT BREAKER
CCT	COMPENSATING CURRENT TRANSFORMER
CH	CABLE HEAD
CT	CURRENT TRANSFORMER
DS	DISCONNECTING SWITCH
LA	LIGHTNING ARRESTER
MCB	MOLDED CASE CIRCUIT BREAKER
M.TR	MAIN TRANSFORMER
PF	POWER FUSE
PT	POTENTIAL TRANSFORMER
PD	POTENTIAL DEVICE
REC	RECLOSING RELAY
S.TR	STATION SERVICE TRANSFORMER
(A)	AC AMMETER
(A)	DC AMMETER
(PF)	POWER FACTOR METER
(PL)	PILOT LAMP
(V)	AC VOLTAGE METER
(V)	DC VOLTAGE METER
(VAR)	VAR METER
(W)	WATT METER
(WH)	WATTHOUR METER
(27)	UNDER VOLTAGE RELAY
(51)	OVER CURRENT RELAY
(51G)	OVER CURRENT GROUND RELAY
(64D)	DC GROUND RELAY

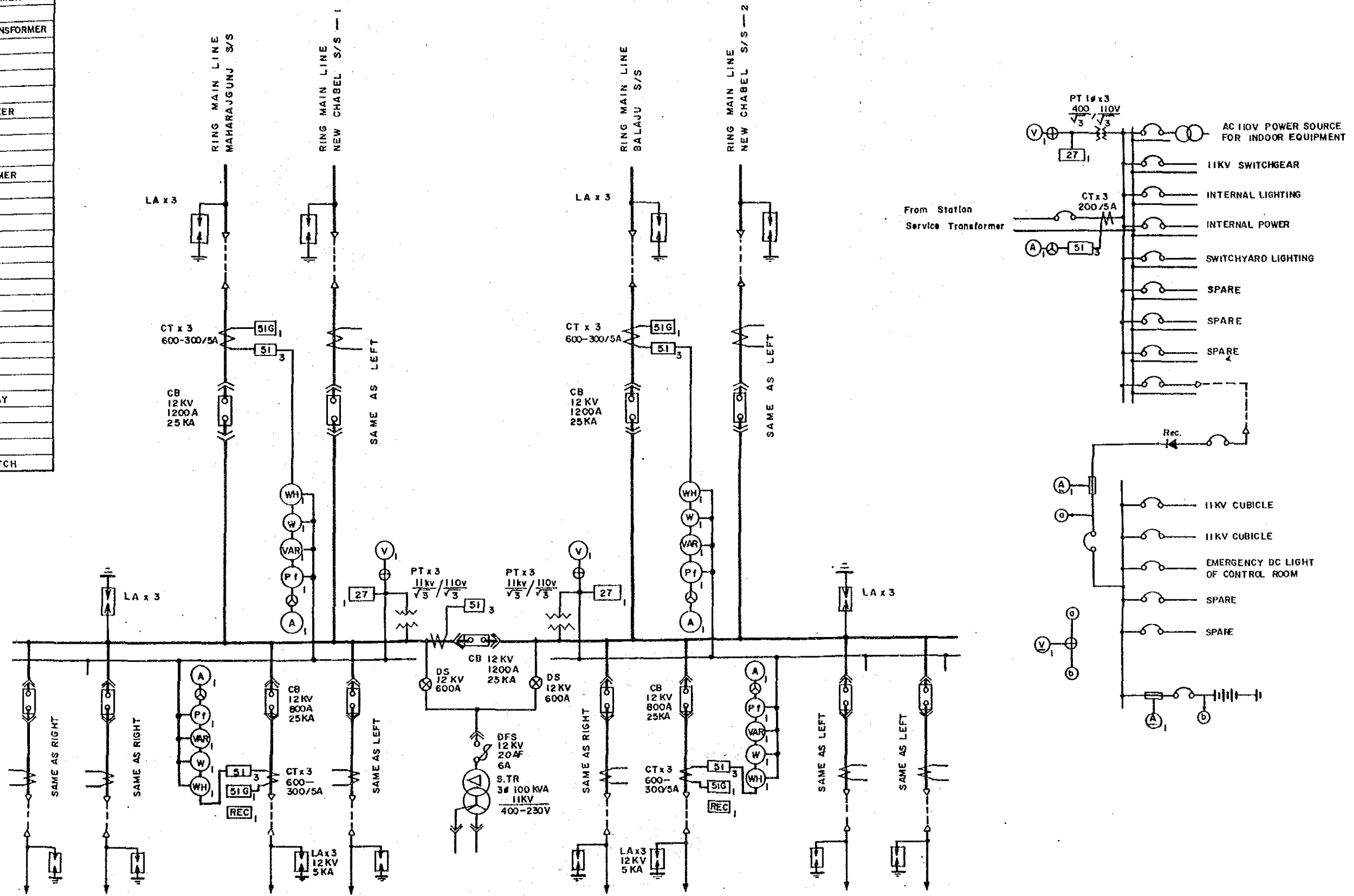






Works under the Project

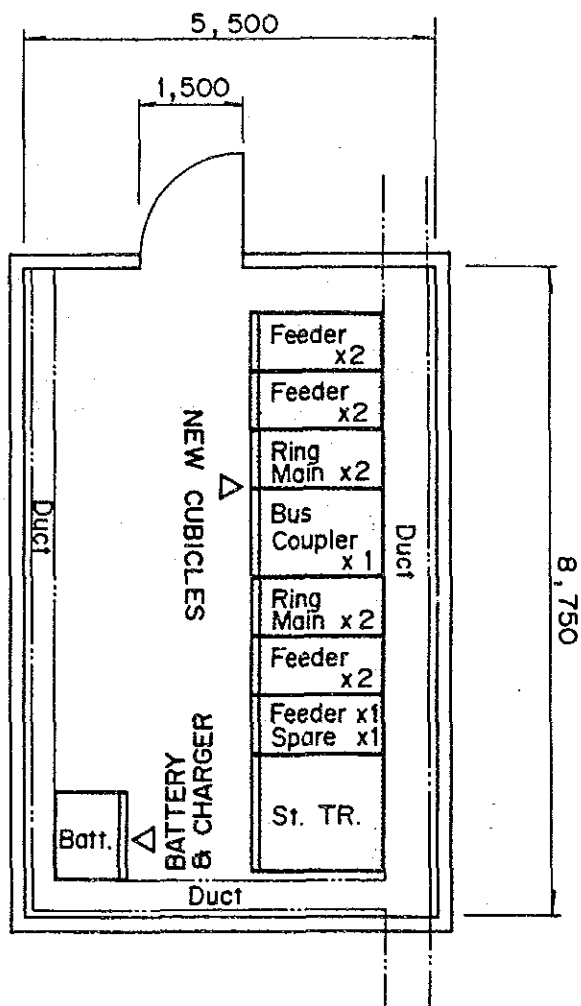
LEGEND	
BCT	BUSHING CURRENT TRANSFORMER
CB	CIRCUIT BREAKER
CCT	COMPENSATING CURRENT TRANSFORMER
CH	CABLE HEAD
CT	CURRENT TRANSFORMER
DS	DISCONNECTING SWITCH
LA	LIGHTNING ARRESTER
MCB	MOLDED CASE CIRCUIT BREAKER
M.TR	MAIN TRANSFORMER
PT	POTENTIAL TRANSFORMER
PD	POTENTIAL DEVICE
STR	STATION SERVICE TRANSFORMER
(A)	AC AMMETER
(A)	DC AMMETER
(Pf)	POWER FACTOR METER
(VAR)	VAR METER
(PL)	PILOT LAMP
(SY)	SYNCHRONIZER
(V)	VOLT METER
(V)	DC VOLT METER
(W)	WATTMETER
(WH)	WATTHOURMETER
(F)	FREQUENCYMETER
[27]	UNDER VOLTAGE RELAY
[51]	OVER CURRENT RELAY
[51G]	OVER CURRENT GROUND RELAY
[97]	DIFFERENTIAL RELAY
[90]	VOLTAGE REGULATE RELAY
[PWR]	PILOT WIRE RELAY
DFS	DISCONNECTING FUSE SWITCH



ネパール王国 カトマंडウ地区送配電網拡張整備計画調査	NEPAL ELECTRICITY AUTHORITY 国際協力事業団	TITLE 図 11.9 オールドチャベル開閉所の単線結線図
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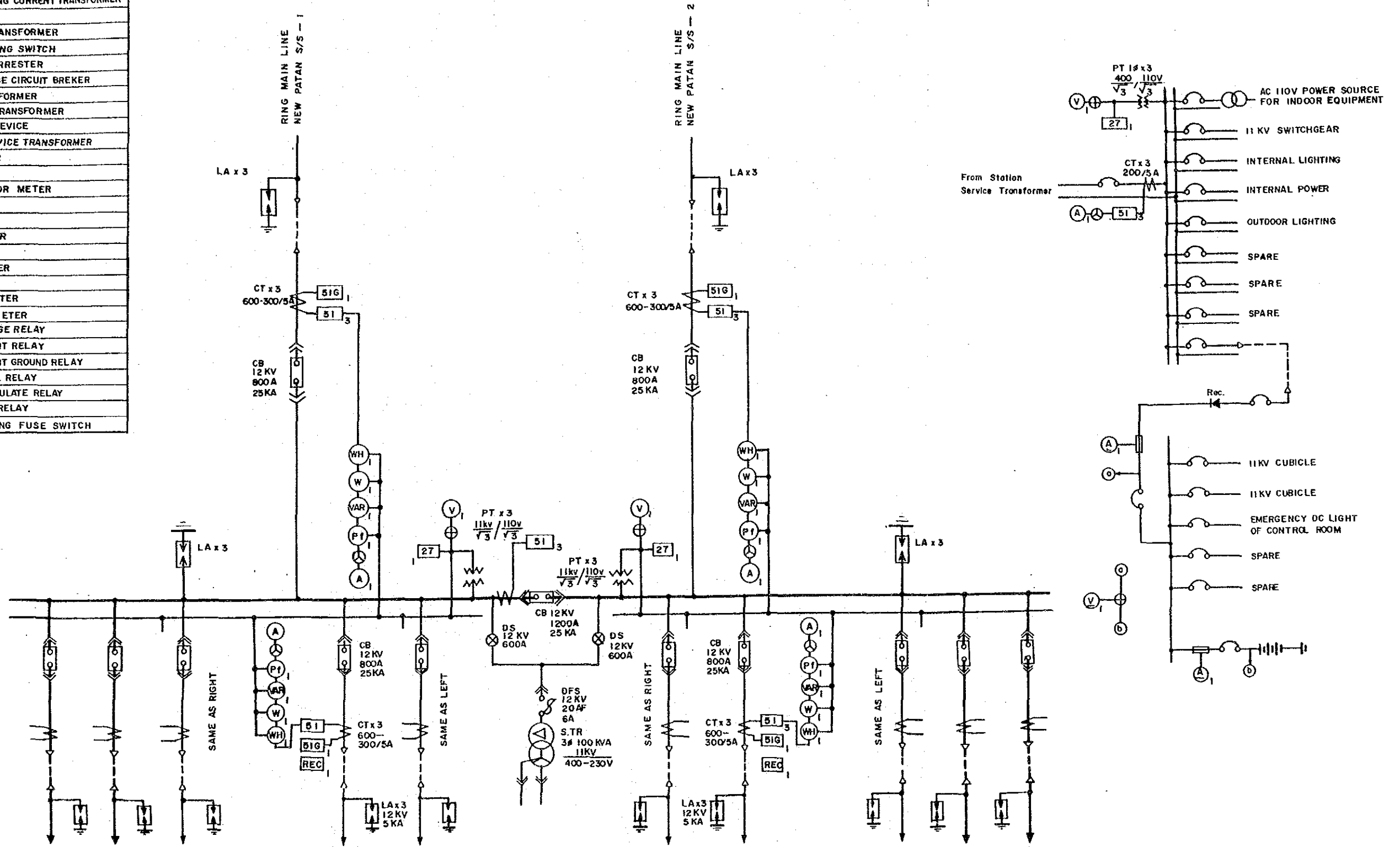






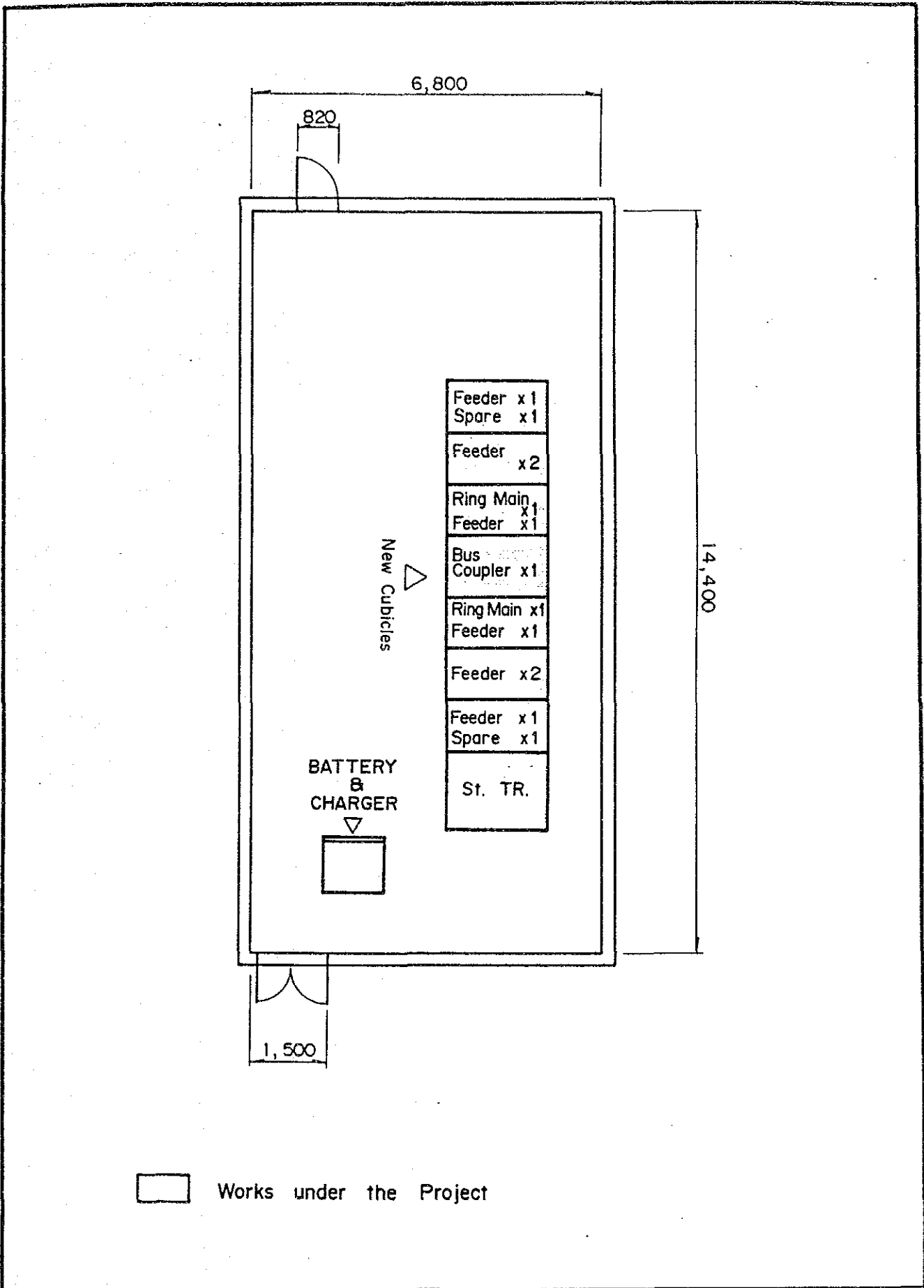
Works under the Project

LEGEND	
BCT	BUSHING CURRENT TRANSFORMER
CB	CIRCUIT BREAKER
CCT	COMPENSATING CURRENT TRANSFORMER
CH	CABLE HEAD
CT	CURRENT TRANSFORMER
DS	DISCONNECTING SWITCH
LA	LIGHTNING ARRESTER
MCB	MOLDED CASE CIRCUIT BREKER
M.TR	MAIN TRANSFORMER
PT	POTENTIAL TRANSFORMER
PD	POTENTIAL DEVICE
STR	STATION SERVICE TRANSFORMER
(A)	AC AMMETER
(A)	DC AMMETER
(PF)	POWER FACTOR METER
(VAR)	VAR METER
(PL)	PILOT LAMP
(SY)	SYNCHRONIZER
(V)	VOLT METER
(V)	DC VOLT METER
(W)	WATTMETER
(WH)	WATHOURMETER
(F)	FREQUENCYMETER
(27)	UNDER VOLTAGE RELAY
(51)	OVER CURRENT RELAY
(51G)	OVER CURRENT GROUND RELAY
(87)	DIFFERENTIAL RELAY
(90)	VOLTAGE REGULATE RELAY
(FWR)	PILOT WIRE RELAY
(DFS)	DISCONNECTING FUSE SWITCH



ネパール王国 カトマンズ地区送配電網拡張整備計画調査	NEPAL ELECTRICITY AUTHORITY 国際協力事業団	TITLE 図 11.11 オールドバタン開閉所の単線結線図
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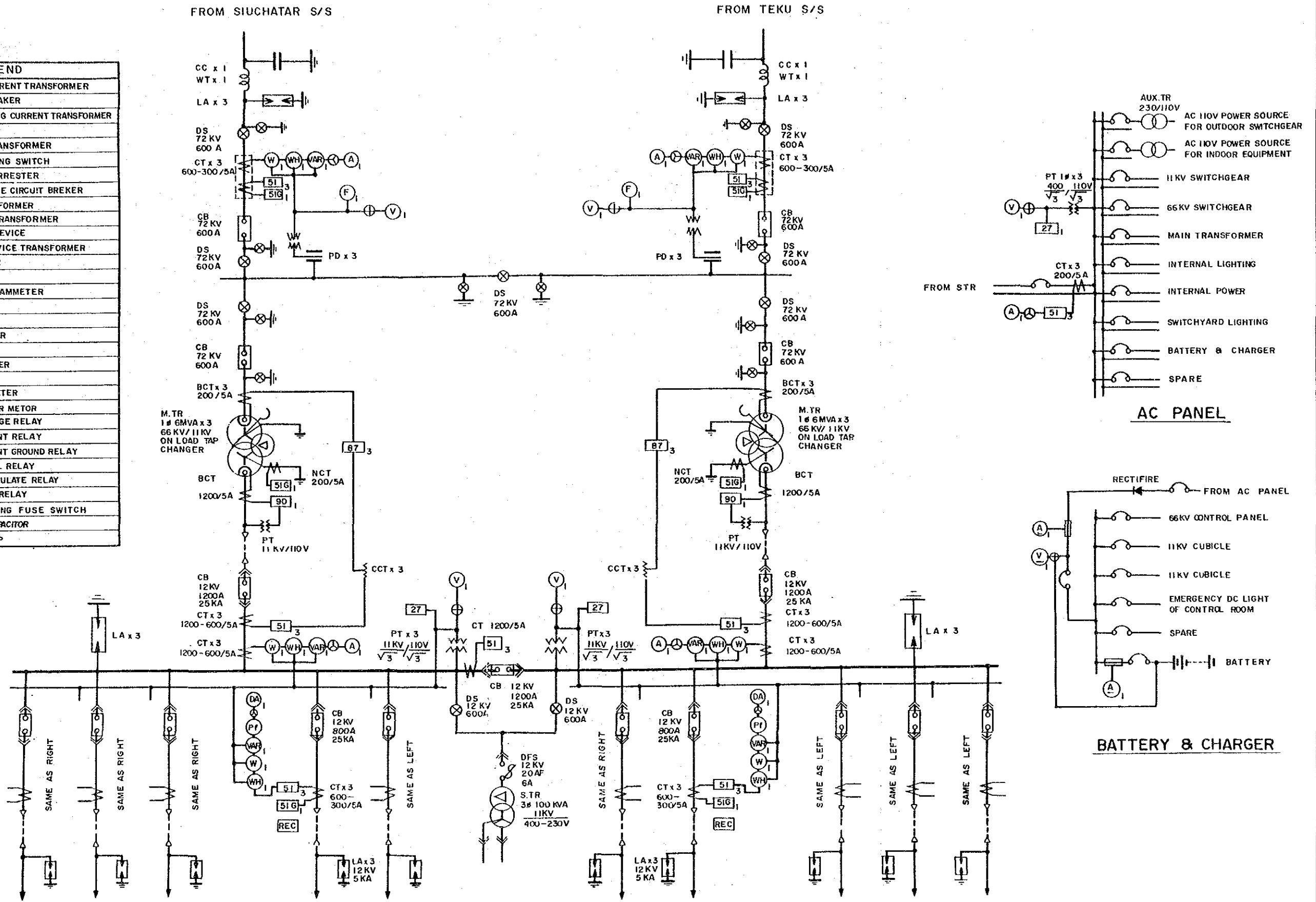


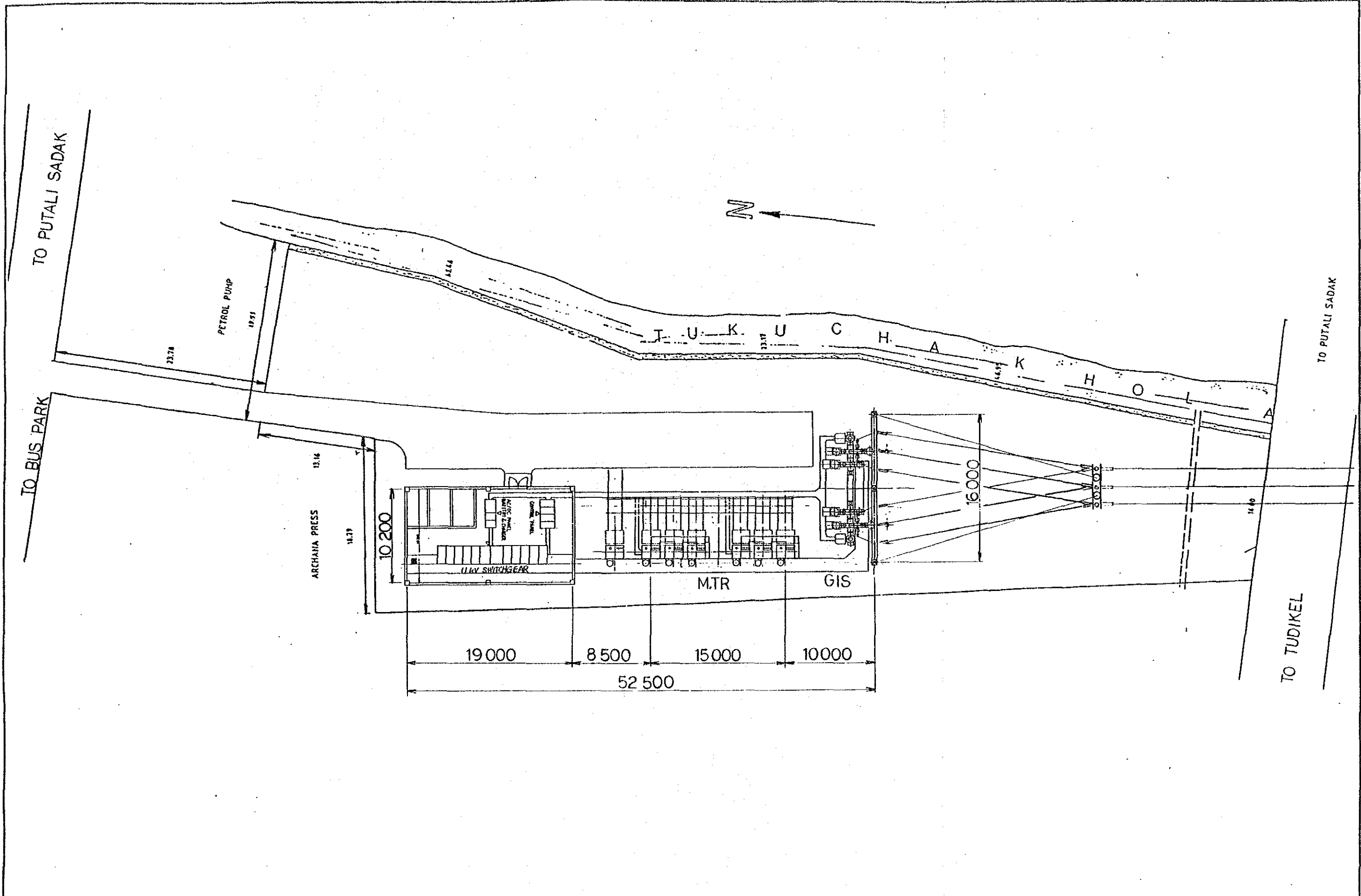


Works under the Project

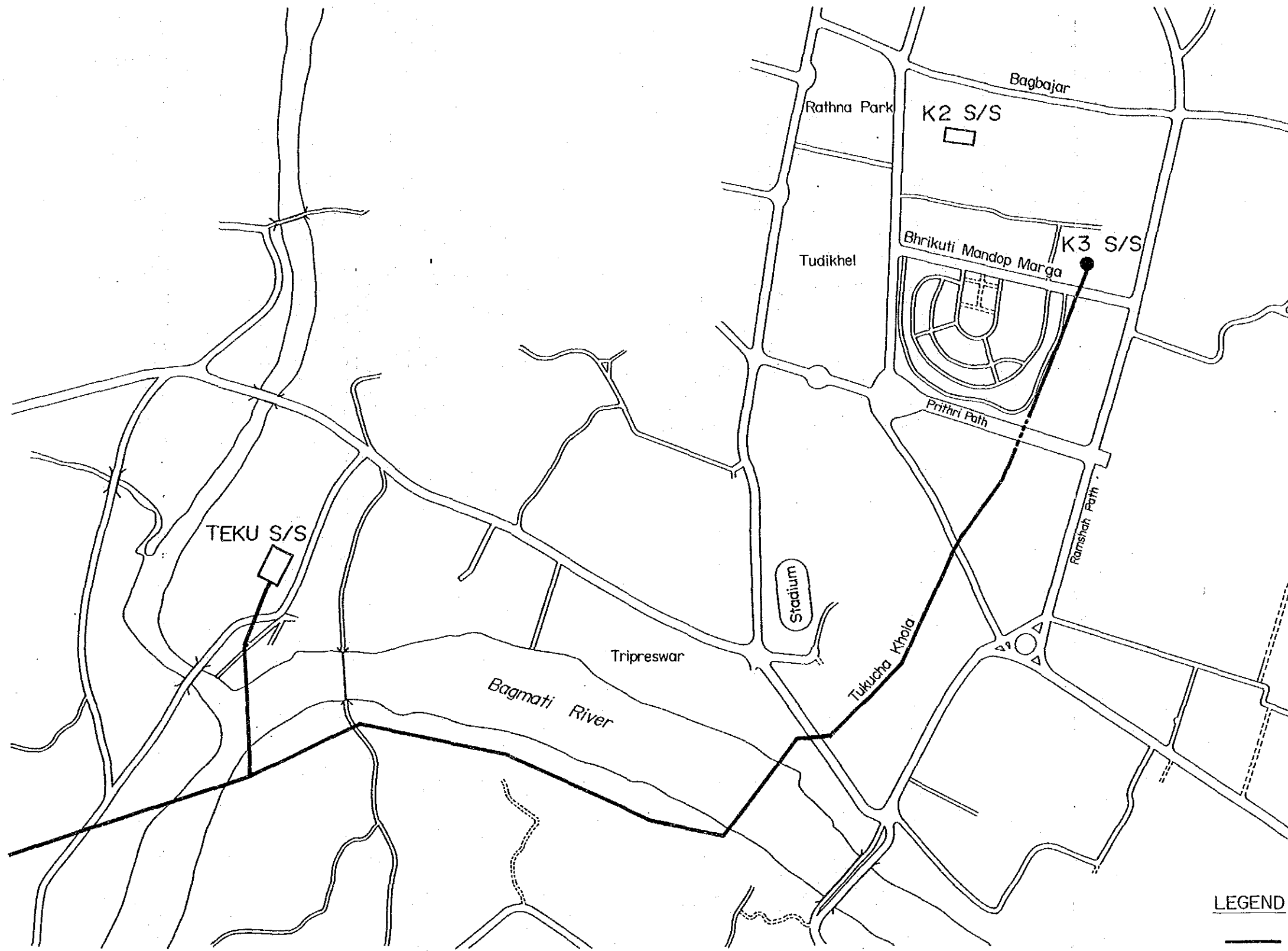
नेपाल王国 काठमान्डु क्षेत्रीय वितरण विभाग काठमान्डु क्षेत्रीय वितरण विभाग	NEPAL ELECTRICITY AUTHORITY 国際協力事業団	TITLE 図 11.12 オールドバタン開閉所の11kV屋内盤 配置図
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LEGEND	
BCT	BUSHING CURRENT TRANSFORMER
CB	CIRCUIT BREAKER
CCT	COMPENSATING CURRENT TRANSFORMER
CH	CABLE HEAD
CT	CURRENT TRANSFORMER
DS	DISCONNECTING SWITCH
LA	LIGHTNING ARRESTER
MCB	MOLDED CASE CIRCUIT BREAKER
M.TR	MAIN TRANSFORMER
PT	POTENTIAL TRANSFORMER
PD	POTENTIAL DEVICE
STR	STATION SERVICE TRANSFORMER
(A)	AC AMMETER
(A)	DC AMMETER
(DA)	AC DEMAND AMMETER
(VAR)	VAR METER
(PL)	PILOT LAMP
(SY)	SYNCHRONIZER
(V)	VOLT METER
(V)	DC VOLT METER
(W)	WATTMETER
(WH)	WATTHOURMETER
(PF)	POWER FACTOR METER
(27)	UNDER VOLTAGE RELAY
(51)	OVER CURRENT RELAY
(51G)	OVER CURRENT GROUND RELAY
(87)	DIFFERENTIAL RELAY
(90)	VOLTAGE REGULATE RELAY
(PWR)	PILOT WIRE RELAY
DFS	DISCONNECTING FUSE SWITCH
CC	COUPLING CAPACITOR
WT	WAVE TRAP





नेपाल王国 काठमान्डु क्षेत्रीय वितरण विभाग काठमान्डु क्षेत्रीय वितरण विभाग	NEPAL ELECTRICITY AUTHORITY International Cooperation Agency	TITLE 図 11.14 K3変電所の配置図
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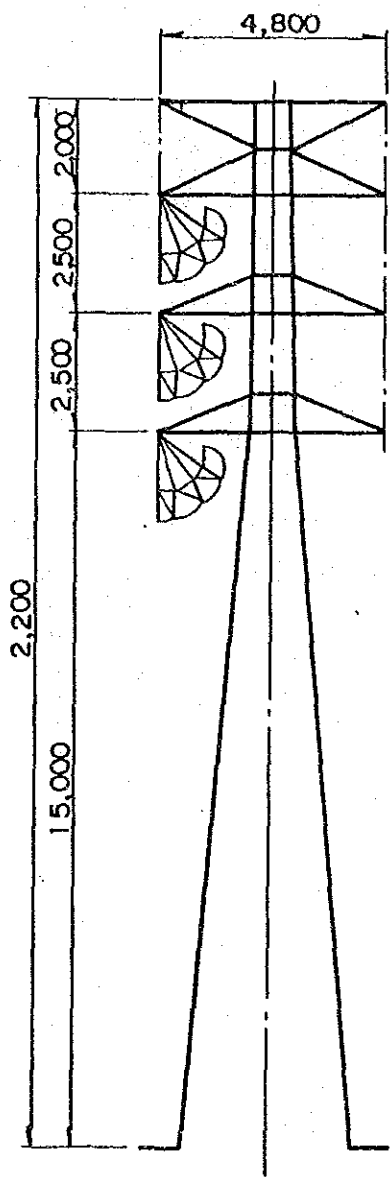


LEGEND

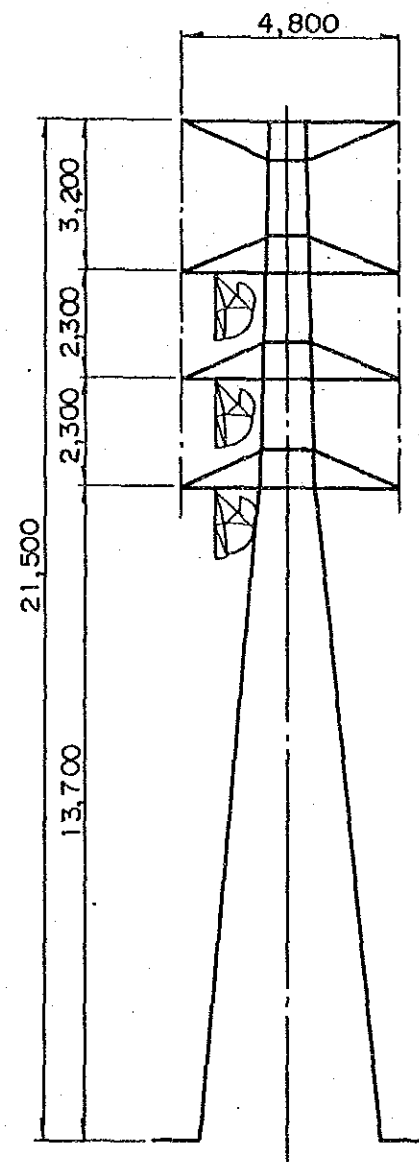
—— OVERHEAD LINE

- - - UNDERGROUND CABLES

<p>ネパール王国 カトマंडウ地区送配電網拡張整備計画調査</p>	<p>NEPAL ELECTRICITY AUTHORITY 国際協力事業団</p>	<p>TITLE 図 11.15 66kV テク ~ K3 線のルート図</p>
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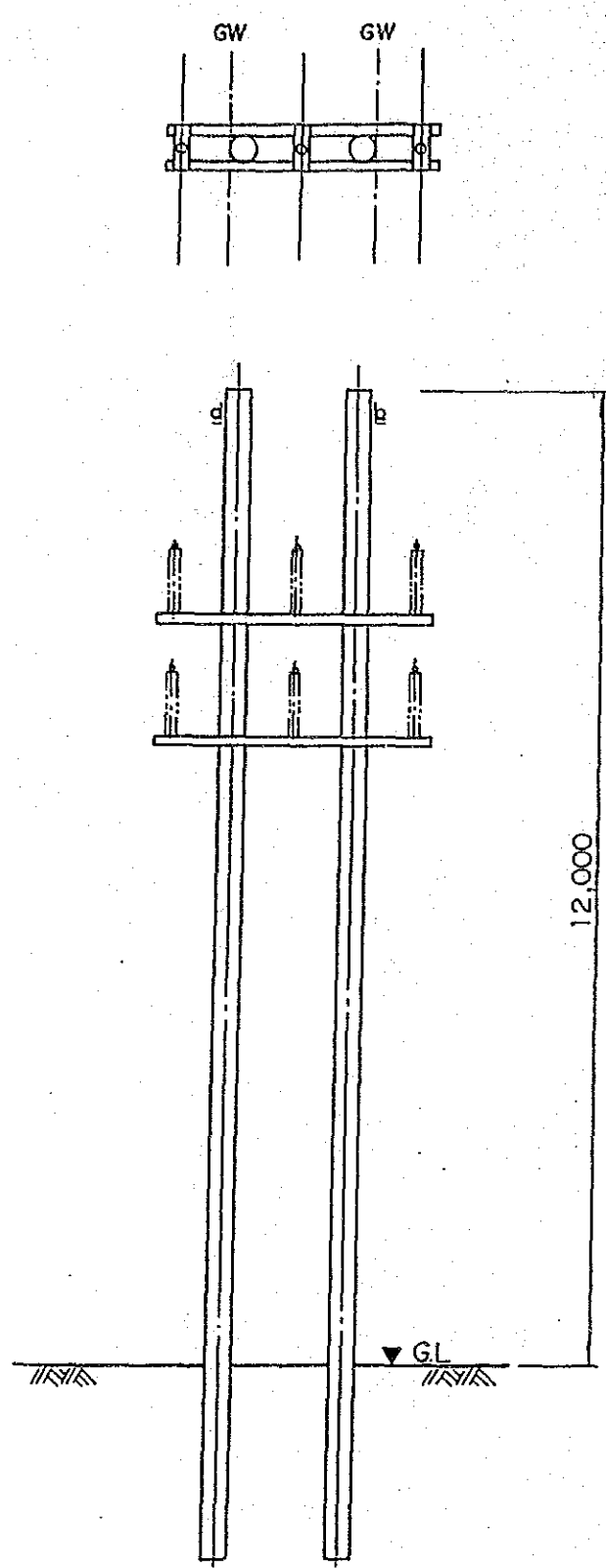
SUSPENSION TYPE



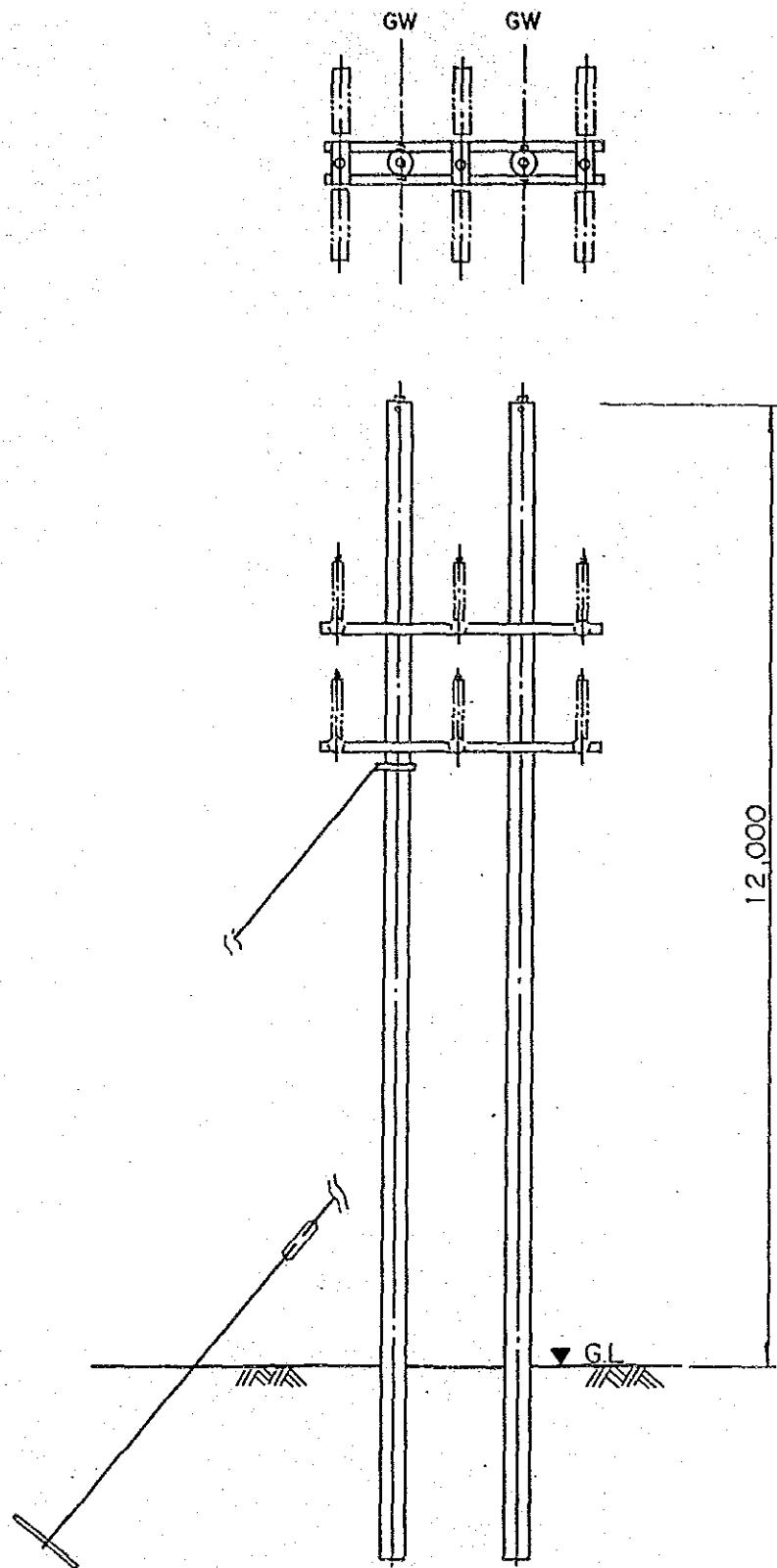
TENSION TYPE

नेपाल王国 काठमांडू地区送配電網拡張整備計画調査	NEPAL ELECTRICITY AUTHORITY 国際協力事業団	TITLE 図 11.16 66kV 2 回線送電線用鉄塔
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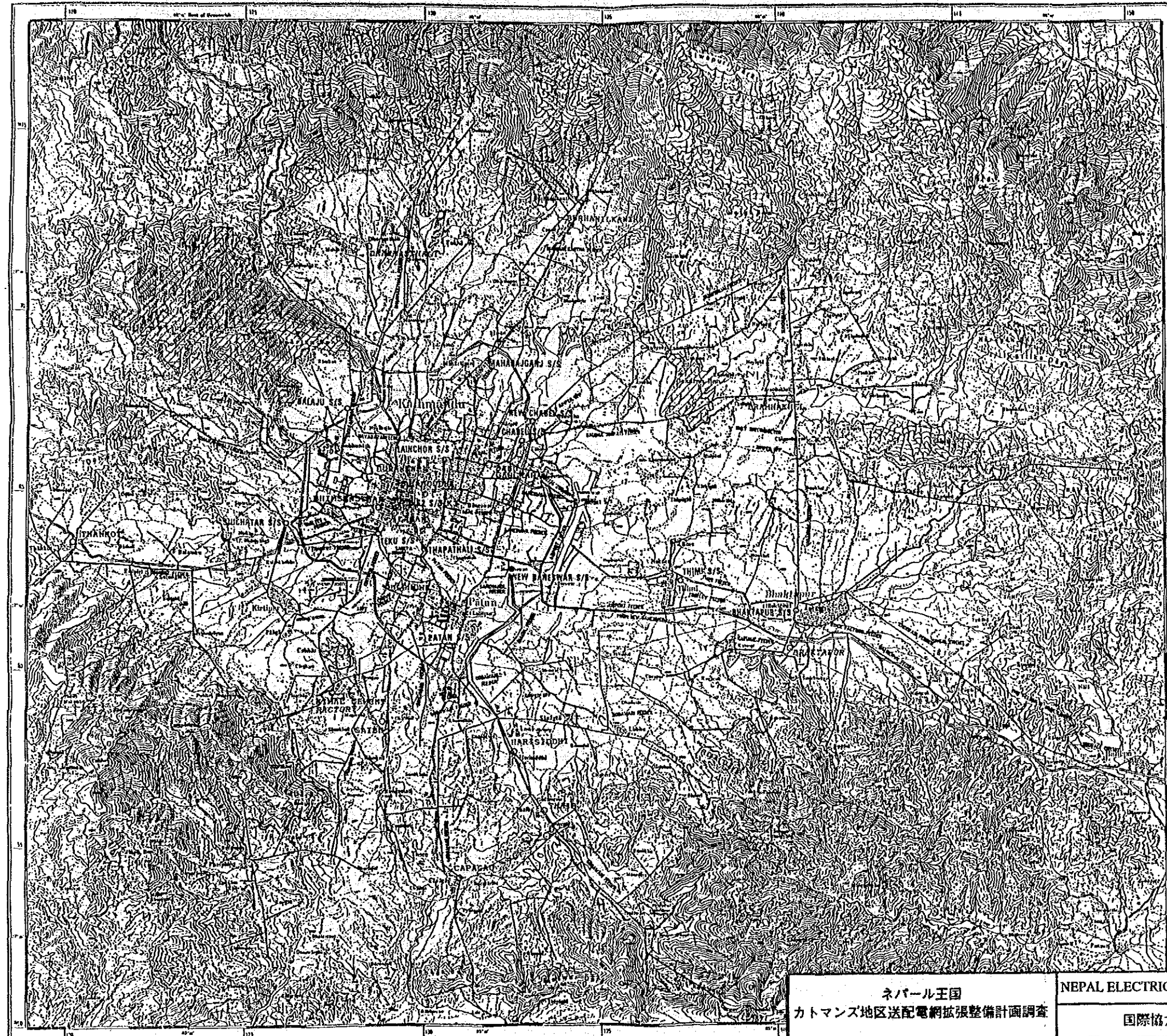
STRAIGHT TYPE



ANGLE TYPE

नेपाल王国 काठमांडू地区送配電網擴張整備計画調査	NEPAL ELECTRICITY AUTHORITY 国際協力事業団	TITLE 図 11.17 66kV送電線用支持物
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KATHMANDU VALLEY



Legend Kathmandu Valley Map 1:50,000

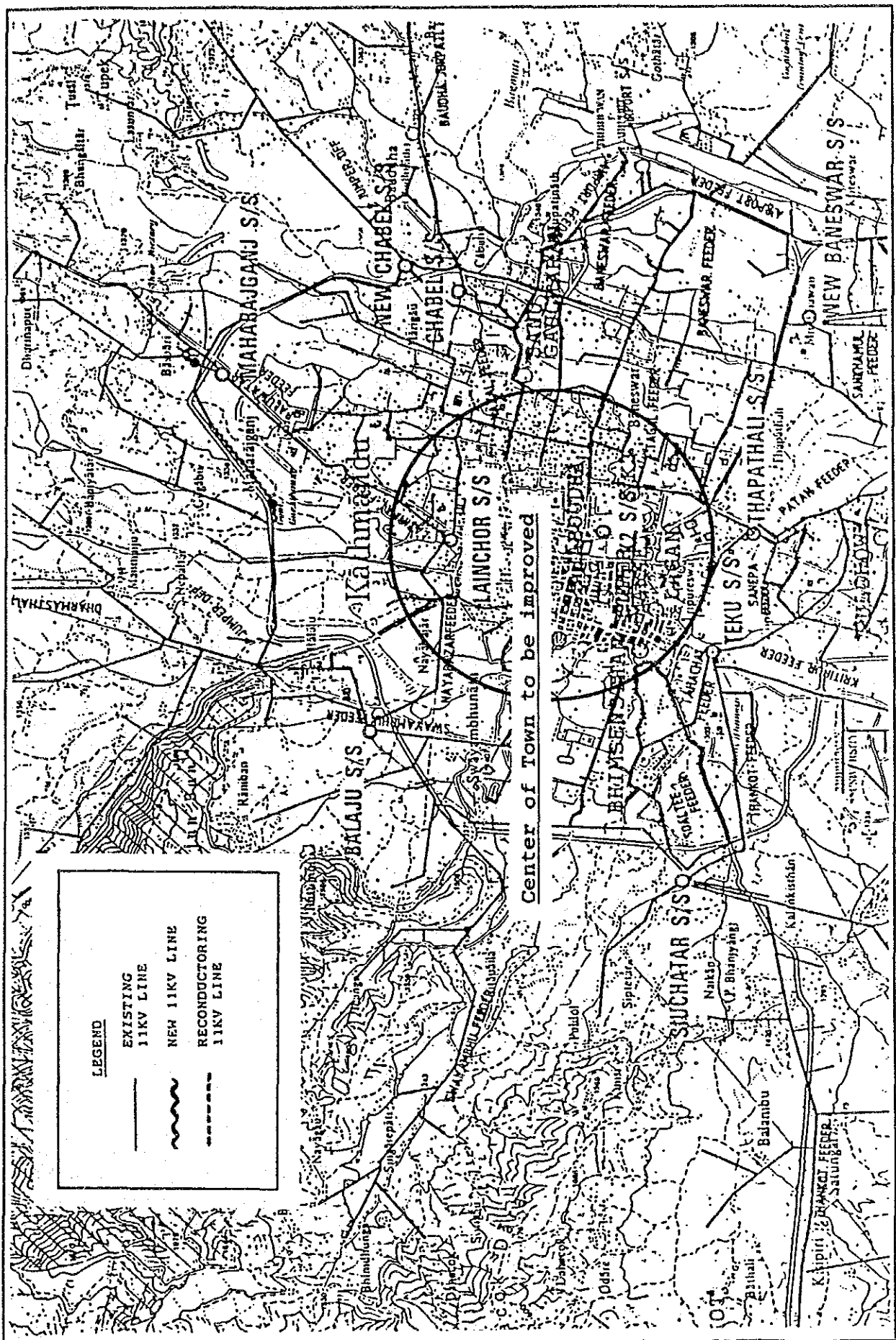
- Motor road
- Public road
- Tarmac Paved road
- Road under construction
- Footpath
- Monumentary path
- e.g. temple, steps, etc.
- Railway
- Power lines with poles
- Water pipe
- Drain, Sewerage, Garage
- 200 m - 500 ft
- 400 m - 1200 ft Contour
- 80 m - 260 ft
- Spot height
- Contour interval

m	ft	m	ft
1000	3281	9000	29363
1200	3937	10000	32808
1400	4593	11000	36022
1600	5249	12000	39437
1800	5905	13000	42851
2000	6561	14000	46266

Scale 1:50,000 (2 cm = 1 km)

<p>ネパール王国 カトマンズ地区送配電網拡張整備計画調査</p>	<p>NEPAL ELECTRICITY AUTHORITY 国際協力事業団</p>	<p>TITLE 図 12.1 カトマンズ盆地内の11kV配電システム</p>
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<p>ネパール王国 カトマンズ地区送配電網拡張整備計画調査</p>	<p>NEPAL ELECTRICITY AUTHORITY 国際協力事業団</p>	<p>TITLE 図 12.2 カトマンズ中央電力区の補強計画</p>
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