Database Information

Equipment Name	Main Circuit Braker

1. Name of Substation : KIRIBATHKUMBURA
2. Number of Units : 7
3. Particulars :

Items \ Data		Identification Number			
		H10/H20/L15 /L25/L35/L45 /S10			
(1) Type		ELF SF2-1 SF6 CB			
(2) Rated Voltage	(kV)	145			
(3) Rated Current	(A)	2000			
(4) Rated Interrupting Current	(kA/MVA)	25/5700			
(5) Making Current	(kA)	N/A			
(6) Rated Short Time Withstand Current/Duration	(kA/S)	25/(N/A)			
(7) Basic Insulation Level	(kV)	650			
(8) Total Weight	(kg)	N/A			
(9) Year of Manufacturer		1986			
(10) Manufacturer		BBC			

Remarks

Database Information

Equipment Name	Main Transformer

1. Name of Substation : KOLLUPITIYA

(Address : Kollupitiya, Colombo 3)

2. Number of Units & Capacity : 2 x 30 MVA

3. Particulars :

Items \ Data		Unit Number			
		No. 1	No. 2	No. 3	No. 4
(1) Number of Phase		3 phase	3 phase		
(2) Capacity	(MVA)	30	30		
(3) Rated Voltage	(kV)	132/11	132/11		
(4) Basic Insulation Level	(kV)	550	550		
(5) Impedance	(%/MVA)	29.2/30	29.2/30		
Primary - Secondary	(%/MVA)				
Primary - Tertiary	(%/MVA)				
Secondary - Tertiary	(%/MVA)				
(6) Connection Symbol		YnynO	YnynO		
(7) Cooling System		ONAN/ONAF	ONAN/ONAF		
(8) Number of Taps		13	13		
(9) Voltage Range		+5% -15%	+5% -15%		
(10) Weight - Total	(tons)	N/A	N/A		
- Transportation	(tons)	47.0	47.0		
(11) Year of Manufacturer		1984	1984		
(12) Manufacturer		BBC	BBC		

Remarks

Database Information

Equipment Name	Main Circuit Braker

1. Name of Substation : KOLLUPITIYA
2. Number of Units : 4
3. Particulars :

Items \ Data		Identification Number			
		105/205 /110/210			
(1) Type		SF6 CB			
(2) Rated Voltage	(kV)	132			
(3) Rated Current	(A)	1250			
(4) Rated Interrupting Current	(kA/MVA)	25/5700			
(5) Making Current	(kA)	63			
(6) Rated Short Time Withstand Current/Duration	(kA/S)	25/3			
(7) Basic Insulation Level	(kV)	650			
(8) Total Weight	(kg)	1020			
(9) Year of Manufacturer		1983			
(10) Manufacturer		BBC			

Remarks

Database Information

Equipment Name	Main Transformer

1. Name of Substation : KOLONNAWA (1/2)

(Address : Ceylon Electricity Board, Kolonnawa, Wellampitiya)

2. Number of Units & Capacity : 4 x 30 MVA, 2 x 15 MVA

3. Particulars :

Items \ Data		Unit Number			
		No. 1	No. 2	No. 3	No. 4 (INTER CONNECTOR)
(1) Number of Phase		3 phase	3 phase	3 phase	3 phase
(2) Capacity	(MVA)	30	30	30	30
(3) Rated Voltage	(kV)	132/33	132/33	132/33	132/69.3/34.57
(4) Basic Insulation Level	(kV)	N/A	N/A	N/A	N/A
(5) Impedance	(%/MVA)	11.85/30	12.15/30	13/30	
Primary - Secondary	(%/MVA)				11.9/30
Primary - Tertiary	(%/MVA)				10.85/30
Secondary - Tertiary	(%/MVA)				6.15/30
(6) Connection Symbol		Ydl	Ydl	Ydl	Dyl Yyo
(7) Cooling System		ON/OB	ON/OB	ON/OB	ONAF
(8) Number of Taps		23	23	23	N/A
(9) Voltage Range		+10% -10%	+10% -10%	+10% -10%	N/A
(10) Weight - Total	(tons)	83.0	83.0	51.8	83.2
- Transportation	(tons)	N/A	N/A	N/A	N/A
(11) Year of Manufacturer		1957	1957	1962	1957
(12) Manufacturer		SAVOISSINNE FRANCE	SAVOISSINNE FRANCE	SAVOISSINNE FRANCE	SAVOISSINNE FRANCE

Remarks

Database Information

Equipment Name	Main Transformer

1. Name of Substation : KOLONNAWA (2/2)

(Address : Ceylon Electricity Board, Kolonnawa, Wellampitiya)

2. Number of Units & Capacity : 4 x 30 MVA, 2 x 15 MVA

3. Particulars :

Items \ Data		Unit Number			
		No. 1	No. 2	No. 3	No. 4
(1) Number of Phase		3 phase	3 phase		
(2) Capacity	(MVA)	15	15		
(3) Rated Voltage	(kV)	66/11	66/11		
(4) Basic Insulation Level	(kV)	N/A	N/A		
(5) Impedance	(%/MVA)	N/A	N/A		
Primary - Secondary	(%/MVA)	N/A	N/A		
Primary - Tertiary	(%/MVA)	N/A	N/A		
Secondary - Tertiary	(%/MVA)	N/A	N/A		
(6) Connection Symbol		N/A	N/A		
(7) Cooling System		N/A	N/A		
(8) Number of Taps		N/A	N/A		
(9) Voltage Range		N/A	N/A		
(10) Weight - Total	(tons)	N/A	N/A		
- Transportation	(tons)	N/A	N/A		
(11) Year of Manufacturer		N/A	N/A		
(12) Manufacturer		N/A	N/A		

Remarks

Database Information

Equipment Name	Main Circuit Braker

1. Name of Substation : KOLONNAWA
2. Number of Units : 20
3. Particulars :

Items \ Data		Identification Number			
		D200/D210/D220/D230/D240/D250/D260/D270/D290/D300/D310/D320/D330/D340	D280/D350	205/105/120	D420
(1) Type		HLR145/2501E1 MINIMUM OIL TYPE	ELF145 nclrtv SF6 CB	N/A	N/A
(2) Rated Voltage	(kV)	145	145	N/A	N/A
(3) Rated Current	(A)	2500	2000	N/A	N/A
(4) Rated Interrupting Current	(kA/MVA)	31.5/7200	20/4600	N/A	N/A
(5) Making Current	(kA)	79	N/A	N/A	N/A
(6) Rated Short Time Withstand Current/Duration	(kA/S)	31.5/3	20/(N/A)	N/A	N/A
(7) Basic Insulation Level	(kV)	650/275	650	N/A	N/A
(8) Total Weight	(kg)	2685	N/A	N/A	N/A
(9) Year of Manufacturer		1985	1983	N/A	N/A
(10) Manufacturer		ASEA SWEEDEN	BBC	N/A	N/A

Remarks

Database Information

Equipment Name	Main Transformer

1. Name of Substation : KOTMALE

(Address : Ceylon Electricity Board, Kotmale)

2. Number of Units & Capacity : 3 x 90 MVA

3. Particulars :

Items \ Data		Unit Number			
		No. 1	No. 2	No. 3	No. 4
(1) Number of Phase		3 phase	3 phase	3 phase	
(2) Capacity	(MVA)	90	90	90	
(3) Rated Voltage	(kV)	220/13.8	220/13.8	220/132/13.8	
(4) Basic Insulation Level	(kV)	N/A	N/A	N/A	
(5) Impedance	(%/MVA)	10/90	10/90		
Primary - Secondary	(%/MVA)			10/90	
Primary - Tertiary	(%/MVA)			13.7/90	
Secondary - Tertiary	(%/MVA)			10.2/90	
(6) Connection Symbol		YndI	YndI	YnaOd2	
(7) Cooling System		OFAF	OFAF	N/A	
(8) Number of Taps		9	9	N/A	
(9) Voltage Range		+15% -5%	+15% -5%	N/A	
(10) Weight - Total	(tons)	N/A	N/A	N/A	
- Transportation	(tons)	N/A	N/A	N/A	
(11) Year of Manufacturer		1982	1982	N/A	
(12) Manufacturer		ASEA	ASEA	N/A	

Remarks

Database Information

Equipment Name	Main Circuit Braker

1. Name of Substation : KOTMALE
2. Number of Units : 17
3. Particulars :

Items \ Data		Identification Number			
		110/120/130/210 /220/230/330/430 /530/320/420/520	L15/L25/T130		
(1) Type		OIL MINIMUM TYPE84-420 /250XE	N/A		
(2) Rated Voltage	(kV)	245	N/A		
(3) Rated Current	(A)	2500	N/A		
(4) Rated Interrupting Current	(kA/MVA)	40/15000	N/A		
(5) Making Current	(kA)	N/A	N/A		
(6) Rated Short Time Withstand Current/Duration	(kA/S)	50/1	N/A		
(7) Basic Insulation Level	(kV)	N/A	N/A		
(8) Total Weight	(kg)	N/A	N/A		
(9) Year of Manufacturer		1982	N/A		
(10) Manufacturer		ASEA	N/A		

Remarks

Database Information

Equipment Name	Main Transformer

1. Name of Substation : KOTUGODA

(Address : Ceylon Electricity Board, Opatha, Kotugoda)

2. Number of Units & Capacity : 2 x 250 MVA

3. Particulars :

Items \ Data		Unit Number			
		No. 1	No. 2	No. 3	No. 4
(1) Number of Phase		3 phase	3 phase		
(2) Capacity	(MVA)	250	250		
(3) Rated Voltage	(kV)	220/132/33	220/132/33		
(4) Basic Insulation Level	(kV)	850	850		
(5) Impedance	(%/MVA)				
Primary - Secondary	(%/MVA)	13.8/250	13.8/250		
Primary - Tertiary	(%/MVA)	89/250	89/250		
Secondary - Tertiary	(%/MVA)	153.3/250	153.3/250		
(6) Connection Symbol		YnaOdl	YnaOdl		
(7) Cooling System		ONAN/ONAF	ONAN/ONAF		
(8) Number of Taps		13	13		
(9) Voltage Range		+15% -5%	+15% -5%		
(10) Weight - Total	(tons)	58.5	58.5		
- Transportation	(tons)	42.0	42.0		
(11) Year of Manufacturer		1983	1983		
(12) Manufacturer		TAKAOKA ELECT. CO. LTD.TOKYO	TAKAOKA ELECT. CO. LTD.TOKYO		

Remarks

Database Information

Equipment Name	Main Circuit Braker

1. Name of Substation : KOTUGODA
2. Number of Units : 6
3. Particulars :

Items \ Data		Identification Number			
		LD100/LD110 /LD120/LD130	180/280		
(1) Type		FLX145 SF6 CB	HLR145 /2501E		
(2) Rated Voltage	(kV)	145	145		
(3) Rated Current	(A)	3000	2500		
(4) Rated Interrupting Current	(kA/MVA)	40/9100	31.5/7200		
(5) Making Current	(kA)	100	79		
(6) Rated Short Time Withstand Current/Duration	(kA/S)	40/3	50/3		
(7) Basic Insulation Level	(kV)	650	N/A		
(8) Total Weight	(kg)	3870	2610		
(9) Year of Manufacturer		1981	N/A		
(10) Manufacturer		N/A	ASEA		

Remarks

Database Information

Equipment Name	Main Transformer

1. Name of Substation : KURUNEGALA

(Address : Ceylon Electricity Board, Mallawapitiya, Kurunegala)

2. Number of Units & Capacity : 2 x 16 MVA

3. Particulars :

Items \ Data		Unit Number			
		No. 1	No. 2	No. 3	No. 4
(1) Number of Phase		3 phase	3 phase		
(2) Capacity	(MVA)	16	16		
(3) Rated Voltage	(kV)	132/33	132/33		
(4) Basic Insulation Level	(kV)	550	550		
(5) Impedance	(%/MVA)	10.87/16	10.81/16		
Primary - Secondary	(%/MVA)				
Primary - Tertiary	(%/MVA)				
Secondary - Tertiary	(%/MVA)				
(6) Connection Symbol		Yndl	Yndl		
(7) Cooling System		ONAN/ONAF	ONAN/ONAF		
(8) Number of Taps		13	13		
(9) Voltage Range		+5% -15%	+5% -15%		
(10) Weight - Total	(tons)	32.0	32.0		
- Transportation	(tons)	27.4	27.4		
(11) Year of Manufacturer		1986	1986		
(12) Manufacturer		EBG AUSTRIA	EBG AUSTRIA		

Remarks

Database Information

Equipment Name	Main Circuit Braker

1. Name of Substation : KURUNEGALA
2. Number of Units : 5
3. Particulars :

Items \ Data		Identification Number			
		S10/L25/L15	H10/H20		
(1) Type		ELF SF2-1	N/A		
(2) Rated Voltage	(kV)	145	145		
(3) Rated Current	(A)	2000	N/A		
(4) Rated Interrupting Current	(kA/MVA)	25/5700	N/A		
(5) Making Current	(kA)	N/A	N/A		
(6) Rated Short Time Withstand Current/Duration	(kA/S)	N/A	N/A		
(7) Basic Insulation Level	(kV)	650	N/A		
(8) Total Weight	(kg)	N/A	N/A		
(9) Year of Manufacturer		1986	N/A		
(10) Manufacturer		BBC	N/A		

Remarks

Database Information

Equipment Name	Main Transformer

1. Name of Substation : MATUGAMA

(Address : Ceylon Electricity Board, Matugama)

2. Number of Units & Capacity : 2 x 31.5 MVA

3. Particulars :

Items \ Data		Unit Number			
		No. 1	No. 2	No. 3	No. 4
(1) Number of Phase		3 phase	3 phase		
(2) Capacity	(MVA)	31.5	31.5		
(3) Rated Voltage	(kV)	132/33	132/33		
(4) Basic Insulation Level	(kV)	550	550		
(5) Impedance	(%/MVA)	9.98/31.5	9.97/31.5		
Primary - Secondary	(%/MVA)				
Primary - Tertiary	(%/MVA)				
Secondary - Tertiary	(%/MVA)				
(6) Connection Symbol		Yndl	Yndl		
(7) Cooling System		ONAN/ONAF	ONAN/ONAF		
(8) Number of Taps		18	18		
(9) Voltage Range		+10.5% -15%	+10.5% -15%		
(10) Weight - Total	(tons)	54.8	54.8		
- Transportation	(tons)	38.5	38.5		
(11) Year of Manufacturer		1993	1993		
(12) Manufacturer		HYUNDAI KOREA	HYUNDAI KOREA		

Remarks

Database Information

Equipment Name	Main Circuit Braker

1. Name of Substation : MATUGAMA
2. Number of Units : 5
3. Particulars :

Items \ Data		Identification Number			
		D110/D150/D120 /D170/D180			
(1) Type		FLX145 SF6 CB			
(2) Rated Voltage	(kV)	145			
(3) Rated Current	(A)	3000			
(4) Rated Interrupting Current	(kA/MVA)	40/9100			
(5) Making Current	(kA)	100			
(6) Rated Short Time Withstand Current/Duration	(kA/S)	40/3			
(7) Basic Insulation Level	(kV)	650			
(8) Total Weight	(kg)	1710			
(9) Year of Manufacturer		1982			
(10) Manufacturer		ALSTHOM FRANCE			

Remarks

Database Information

Equipment Name	Main Transformer

1. Name of Substation : NEW NUWARA ELIYA

(Address : Ceylon Electricity Board, Magastota, Nuwara Eliya)

2. Number of Units & Capacity : 2 x 250 MVA

3. Particulars :

Items \ Data		Unit Number			
		No. 1	No. 2	No. 3	No. 4
(1) Number of Phase		3 phase	3 phase		
(2) Capacity	(MVA)	31.5	31.5		
(3) Rated Voltage	(kV)	132/33	132/33		
(4) Basic Insulation Level	(kV)	650	650		
(5) Impedance	(%/MVA)	9.55/31.5	9.64/31.5		
Primary - Secondary	(%/MVA)				
Primary - Tertiary	(%/MVA)				
Secondary - Tertiary	(%/MVA)				
(6) Connection Symbol		Yndl	Yndl		
(7) Cooling System		ONAN/ONAF	ONAN/ONAF		
(8) Number of Taps		18	18		
(9) Voltage Range		+10.5% -15%	+10.5% -15%		
(10) Weight - Total	(tons)	65.0	65.0		
- Transportation	(tons)	48.0	48.0		
(11) Year of Manufacturer		1994 -5	1994 -5		
(12) Manufacturer		NYUNDAI KOREA	NYUNDAI KOREA		

Remarks

Database Information

Equipment Name	Main Circuit Braker

1. Name of Substation : NEW NUWARA ELIYA
2. Number of Units : 4
3. Particulars :

Items \ Data		Identification Number			
		L15/L25 /H10/H20			
(1) Type		FXT 13			
(2) Rated Voltage	(kV)	170			
(3) Rated Current	(A)	1250			
(4) Rated Interrupting Current	(kA/MVA)	N/A			
(5) Making Current	(kA)	N/A			
(6) Rated Short Time Withstand Current/Duration	(kA/S)	31.5/3			
(7) Basic Insulation Level	(kV)	750			
(8) Total Weight	(kg)	2040			
(9) Year of Manufacturer		1995			
(10) Manufacturer		G.E.C ALSTHOM			

Remarks

Database Information

Equipment Name	Main Transformer

1. Name of Substation : PADUKKA

(Address : Ceylon Electricity Board, Horana Road, Padukka)

2. Number of Units & Capacity : 4 x 3 MVA

3. Particulars :

Items \ Data		Unit Number			
		No. 1	No. 2	No. 3	No. 4
(1) Number of Phase		3 phase	3 phase	3 phase	3 phase
(2) Capacity	(MVA)	3	3	3	3
(3) Rated Voltage	(kV)	66/33	66/33	66/33	66/33
(4) Basic Insulation Level	(kV)	N/A	N/A	N/A	N/A
(5) Impedance	(%/MVA)	10/(N/A)	10/(N/A)	10/(N/A)	10/(N/A)
Primary - Secondary	(%/MVA)				
Primary - Tertiary	(%/MVA)				
Secondary - Tertiary	(%/MVA)				
(6) Connection Symbol		Yyo	Yyo	Yyo	Yyo
(7) Cooling System		ONAN	ONAN	ONAN	ONAN
(8) Number of Taps		17	17	17	17
(9) Voltage Range		+1.25% -1.25%	+1.25% -1.25%	+1.25% -1.25%	+1.25% -1.25%
(10) Weight - Total	(tons)	N/A	N/A	N/A	N/A
- Transportation	(tons)	28.5	28.5	28.5	28.5
(11) Year of Manufacturer		N/A	N/A	N/A	N/A
(12) Manufacturer		METROPOLYTON VICKERS	METROPOLYTON VICKERS	METROPOLYTON VICKERS	METROPOLYTON VICKERS

Remarks

Database Information

Equipment Name	Main Circuit Braker

1. Name of Substation : PADUKKA
2. Number of Units : 3
3. Particulars :

Items \ Data		Identification Number			
		D610/D620 /D690			
(1) Type		OIL CIRCUIT BREAKER JB429			
(2) Rated Voltage	(kV)	66			
(3) Rated Current	(A)	400			
(4) Rated Interrupting Current	(kA/MVA)	1.31/150			
(5) Making Current	(kA)	N/A			
(6) Rated Short Time Withstand Current/Duration	(kA/S)	N/A			
(7) Basic Insulation Level	(kV)	N/A			
(8) Total Weight	(kg)	N/A			
(9) Year of Manufacturer		1951			
(10) Manufacturer		THOMPSON-HOUSTON CO.LTD			

Remarks

Database Information

Equipment Name	Main Transformer

1. Name of Substation : PANADURA

(Address : Ceylon Electricity Board, Courts Road, Panadura)

2. Number of Units & Capacity : 2 x 31.5 MVA

3. Particulars :

Items \ Data		Unit Number			
		No. 1	No. 2	No. 3	No. 4
(1) Number of Phase		3 phase	3 phase		
(2) Capacity	(MVA)	31.5	31.5		
(3) Rated Voltage	(kV)	132/33	132/33		
(4) Basic Insulation Level	(kV)	N/A	N/A		
(5) Impedance	(%/MVA)	9.98/31.5	9.95/31.5		
Primary - Secondary	(%/MVA)				
Primary - Tertiary	(%/MVA)				
Secondary - Tertiary	(%/MVA)				
(6) Connection Symbol		Yndl	Yndl		
(7) Cooling System		ONAN/ONAF	ONAN/ONAF		
(8) Number of Taps		18	18		
(9) Voltage Range		+10.5% -15%	+10.5% -15%		
(10) Weight - Total	(tons)	54.8	54.8		
- Transportation	(tons)	38.5	38.5		
(11) Year of Manufacturer		1993	1994		
(12) Manufacturer		HYUNDAI KOREA	HYUNDAI KOREA		

Remarks

Database Information

Equipment Name	Main Circuit Braker

1. Name of Substation : PANADURA
2. Number of Units : 4
3. Particulars :

Items \ Data		Identification Number			
		L15/L25 /H110/H20			
(1) Type		FA1-5 SF6 CB			
(2) Rated Voltage	(kV)	145			
(3) Rated Current	(A)	1250			
(4) Rated Interrupting Current	(kA/MVA)	25/5700			
(5) Making Current	(kA)	63			
(6) Rated Short Time Withstand Current/Duration	(kA/S)	(N/A)/3			
(7) Basic Insulation Level	(kV)	N/A			
(8) Total Weight	(kg)	2000			
(9) Year of Manufacturer		1993			
(10) Manufacturer		NISSIN ELECT. CO. LTD. JAPAN			

Remarks

Database Information

Equipment Name	Main Transformer

1. Name of Substation : PANNIPITIYA

(Address : Ceylon Electricity Board, Highlevel Road, Pannipitiya)

2. Number of Units & Capacity : 1 x 31.5 MVA, 2 x 30 MVA

3. Particulars :

Items \ Data		Unit Number			
		No. 1	No. 2	No. 3	No. 4
(1) Number of Phase		3 phase	3 phase	3 phase	
(2) Capacity	(MVA)	30	30	31.5	
(3) Rated Voltage	(kV)	132/33	132/33	132/33	
(4) Basic Insulation Level	(kV)	N/A	N/A	N/A	
(5) Impedance	(%/MVA)	11.15/(N/A)	11.15/(N/A)	11.15/(N/A)	
Primary - Secondary	(%/MVA)				
Primary - Tertiary	(%/MVA)				
Secondary - Tertiary	(%/MVA)				
(6) Connection Symbol		Yndl	Yndl	Yndl	
(7) Cooling System		ONAN/ONAF	ONAN/ONAF	ONAN/ONAF	
(8) Number of Taps		21	21	21	
(9) Voltage Range		N/A	N/A	+1.25% -1.25%	
(10) Weight - Total	(tons)	44.2	44.2	65.5	
- Transportation	(tons)	34.3	34.3	57.5	
(11) Year of Manufacturer		1982	1982	1994	
(12) Manufacturer		BBC	BBC	ABB	

Remarks

Database Information

Equipment Name	Main Circuit Braker

1. Name of Substation : PANNIPITIYA
2. Number of Units : 3
3. Particulars :

Items \ Data		Identification Number			
		N/A			
(1) Type		ELF SF2-1			
(2) Rated Voltage	(kV)	132			
(3) Rated Current	(A)	1600			
(4) Rated Interrupting Current	(kA/MVA)	31.5 /			
(5) Making Current	(kA)	N/A			
(6) Rated Short Time Withstand Current/Duration	(kA/S)	31.5 / 35			
(7) Basic Insulation Level	(kV)	650			
(8) Total Weight	(kg)	1750			
(9) Year of Manufacturer		1982, 1994			
(10) Manufacturer		ABB, INDIA			

Remarks

Database Information

Equipment Name	Main Transformer

1. Name of Substation : PUTTALAM

(Address : Ceylon Electricity Board, Puttalam)

2. Number of Units & Capacity : 2 x 31.5 MVA

3. Particulars :

Items \ Data		Unit Number			
		No. 1	No. 2	No. 3	No. 4
(1) Number of Phase		3 phase	3 phase		
(2) Capacity	(MVA)	31.5	31.5		
(3) Rated Voltage	(kV)	132/33	132/33		
(4) Basic Insulation Level	(kV)	550	550		
(5) Impedance	(%/MVA)	9.95/31.5	9.99/31.5		
Primary - Secondary	(%/MVA)				
Primary - Tertiary	(%/MVA)				
Secondary - Tertiary	(%/MVA)				
(6) Connection Symbol		Yndl	Yndl		
(7) Cooling System		ONAN/ONAF	ONAN/ONAF		
(8) Number of Taps		18	18		
(9) Voltage Range		+10.5% -15%	+10.5% -15%		
(10) Weight - Total	(tons)	54.8	54.8		
- Transportation	(tons)	38.5	38.5		
(11) Year of Manufacturer		1993	1993		
(12) Manufacturer		HYUNDAI KOREA	HYUNDAI KOREA		

Remarks

Database Information

Equipment Name	Main Circuit Braker

1. Name of Substation : PUTTALAM
2. Number of Units : 4
3. Particulars :

Items \ Data		Identification Number			
		L15/L20 /H10/H20			
(1) Type		FA1-S GAS CB			
(2) Rated Voltage	(kV)	145			
(3) Rated Current	(A)	N/A			
(4) Rated Interrupting Current	(kA/MVA)	25/750			
(5) Making Current	(kA)	63			
(6) Rated Short Time Withstand Current/Duration	(kA/S)	13.1/3			
(7) Basic Insulation Level	(kV)	650			
(8) Total Weight	(kg)	2000			
(9) Year of Manufacturer		1993			
(10) Manufacturer		NISSAN CO JAPAN			

Remarks

Database Information

Equipment Name	Main Transformer

1. Name of Substation : RATMALANA

(Address : Ceylon Electricity Board, NO. 688, Galle Road, Ratmalana)

2. Number of Units & Capacity : 2 x 30 MVA, 1 x 31.5 MVA

3. Particulars :

Items \ Data		Unit Number			
		No. 1	No. 2	No. 3	No. 4
(1) Number of Phase		3 phase	3 phase	3 phase	
(2) Capacity	(MVA)	30	30	31.5	
(3) Rated Voltage	(kV)	132/33	132/33	132/33	
(4) Basic Insulation Level	(kV)	N/A	550	550	
(5) Impedance	(%/MVA)	N/A	N/A	10.2/31.5	
Primary - Secondary	(%/MVA)	N/A	N/A		
Primary - Tertiary	(%/MVA)	N/A	N/A		
Secondary - Tertiary	(%/MVA)	N/A	N/A		
(6) Connection Symbol		Yndl	Yndl	Yndl	
(7) Cooling System		N/A	ONAN/ONAF	ONAN/ONAF	
(8) Number of Taps		N/A	21	21	
(9) Voltage Range		N/A	+10% -15.5%	+10% -15.5%	
(10) Weight - Total	(tons)	N/A	44.2	65.5	
- Transportation	(tons)	N/A	34.3	57.5	
(11) Year of Manufacturer		N/A	1973	1994	
(12) Manufacturer		N/A	ABB	ABB	

Remarks

Database Information

Equipment Name	Main Circuit Braker

1. Name of Substation : RATMALANA
2. Number of Units : 5
3. Particulars :

Items \ Data		Identification Number			
		ALL 132kV BREAKERS L15/L25/10/20/30			
(1) Type		ELF SF2-1 SF6 CB			
(2) Rated Voltage	(kV)	145			
(3) Rated Current	(A)	1600			
(4) Rated Interrupting Current	(kA/MVA)	31.5/7200			
(5) Making Current	(kA)	N/A			
(6) Rated Short Time Withstand Current/Duration	(kA/S)	31.5/3			
(7) Basic Insulation Level	(kV)	650			
(8) Total Weight	(kg)	1750			
(9) Year of Manufacturer		1994			
(10) Manufacturer		ABB			

Remarks

Database Information

Equipment Name	Main Transformer

1. Name of Substation : SAPUGASKANDA

(Address : Ceylon Electricity Board, Palliwila, Sapugaskanda)

2. Number of Units & Capacity : 3 x 30 MVA

3. Particulars :

Items \ Data		Unit Number			
		No. 1	No. 2	No. 3	No. 4
(1) Number of Phase		3 phase	3 phase		3 phase
(2) Capacity	(MVA)	30	30		30
(3) Rated Voltage	(kV)	132/33	132/33		132/33
(4) Basic Insulation Level	(kV)	550	550		550
(5) Impedance	(%/MVA)	9.9/30	9.9/30		9.9/30
Primary - Secondary	(%/MVA)				
Primary - Tertiary	(%/MVA)				
Secondary - Tertiary	(%/MVA)				
(6) Connection Symbol		Yndl	Yndl		Yndl
(7) Cooling System		ONAN/ONAF	ONAN/ONAF		ONAN/ONAF
(8) Number of Taps		21	21		21
(9) Voltage Range		+10% -15%	+10% -15%		+10% -15%
(10) Weight - Total	(tons)	44.2	44.2		44.2
- Transportation	(tons)	34.3	34.3		34.3
(11) Year of Manufacturer		1981	1981		1981
(12) Manufacturer		CEM	CEM		CEM

Remarks

Database Information

Equipment Name	Main Circuit Braker

1. Name of Substation : SAPUGASKANDA
2. Number of Units : 7
3. Particulars :

Items \ Data		Identification Number			
		D100/D120	D160/D180 /D190	D170	D130
(1) Type		HPGE12/15E SMALL OIL VOLUME CB	ORIG SMALL OIL VOLUME CB	ORIG SMALL OIL VOLUME CB	SF6 CB
(2) Rated Voltage	(kV)	170	132	132	132
(3) Rated Current	(A)	1000	1250	1250	2000
(4) Rated Interrupting Current	(kA/MVA)	11/2500	11/2500	15.3/3500	25/5700
(5) Making Current	(kA)	27.5	27.5	38	N/A
(6) Rated Short Time Withstand Current/Duration	(kA/S)	11/3	11/3	15.3/3	25/(N/A)
(7) Basic Insulation Level	(kV)	550	550	550	550
(8) Total Weight	(kg)	3090	2788	2788	N/A
(9) Year of Manufacturer		1968	1972	1975	1981
(10) Manufacturer		ALSTHOM	ALSTHOM	ALSTHOM	BBC

Remarks

Database Information

Equipment Name	Main Transformer

1. Name of Substation : THULHIRIYA

(Address : Ceylon Electricity Board, Thulhiriya)

2. Number of Units & Capacity : 2 x 31.5 MVA

3. Particulars :

Items \ Data		Unit Number			
		No. 1	No. 2	No. 3	No. 4
(1) Number of Phase		3 phase	3 phase		
(2) Capacity	(MVA)	31.5	31.5		
(3) Rated Voltage	(kV)	132/33	132/33		
(4) Basic Insulation Level	(kV)	550	550		
(5) Impedance	(%/MVA)	10/31.5	10.3/31.5		
Primary - Secondary	(%/MVA)				
Primary - Tertiary	(%/MVA)				
Secondary - Tertiary	(%/MVA)				
(6) Connection Symbol		Yndl	Yndl		
(7) Cooling System		ONAN/ONAF	ONAN/ONAF		
(8) Number of Taps		16	16		
(9) Voltage Range		+10% -15%	+10% -15%		
(10) Weight - Total	(tons)	44.0	44.0		
- Transportation	(tons)	38.0	38.0		
(11) Year of Manufacturer		1989	1989		
(12) Manufacturer		ALSTHOM-FRANCE	ALSTHOM-FRANCE		

Remarks

Database Information

Equipment Name	Main Circuit Braker

1. Name of Substation : THULHIRIYA
2. Number of Units : 2
3. Particulars :

Items \ Data		Identification Number			
		D110	D120		
(1) Type		HPGE12/15E SMALL OIL VOLUME CB	HPGE12/15E SMALL OIL VOLUME CB		
(2) Rated Voltage	(kV)	170	170		
(3) Rated Current	(A)	1000	1000		
(4) Rated Interrupting Current	(kA/MVA)	11/2500	11/2500		
(5) Making Current	(kA)	27.5	27.5		
(6) Rated Short Time Withstand Current/Duration	(kA/S)	11/1	11/3		
(7) Basic Insulation Level	(kV)	550	550		
(8) Total Weight	(kg)	3090	3090		
(9) Year of Manufacturer		1968	1968		
(10) Manufacturer		N/A	N/A		

Remarks

Database Information

Equipment Name	Main Transformer

1. Name of Substation : TRINCOMALEE

(Address : Ceylon Electricity Board, Love Lane, Trincomalee)

2. Number of Units & Capacity : 2 x 10 MVA

3. Particulars :

Items \ Data		Unit Number			
		No. 1	No. 2	No. 3	No. 4
(1) Number of Phase		3 phase	3 phase		
(2) Capacity	(MVA)	10	10		
(3) Rated Voltage	(kV)	132/33	132/33		
(4) Basic Insulation Level	(kV)	N/A	N/A		
(5) Impedance	(%/MVA)	10/(N/A)	10/(N/A)		
Primary - Secondary	(%/MVA)				
Primary - Tertiary	(%/MVA)				
Secondary - Tertiary	(%/MVA)				
(6) Connection Symbol		Yndl	Yndl		
(7) Cooling System		ONAN	ONAN		
(8) Number of Taps		21	21		
(9) Voltage Range		+10% -15%	+10% -15%		
(10) Weight - Total	(tons)	N/A	N/A		
- Transportation	(tons)	N/A	N/A		
(11) Year of Manufacturer		1978	1978		
(12) Manufacturer		ALSTHOM	ALSTHOM		

Remarks

Database Information

Equipment Name	Main Circuit Braker

1. Name of Substation : TRINCOMALEE
2. Number of Units : 2
3. Particulars :

Items \ Data		Identification Number			
		D110/D120			
(1) Type		OR1G			
(2) Rated Voltage	(kV)	132			
(3) Rated Current	(A)	1250			
(4) Rated Interrupting Current	(kA/MVA)	15.3/3500			
(5) Making Current	(kA)	N/A			
(6) Rated Short Time Withstand Current/Duration	(kA/S)	N/A			
(7) Basic Insulation Level	(kV)	N/A			
(8) Total Weight	(kg)	N/A			
(9) Year of Manufacturer		1975			
(10) Manufacturer		DELLE ALSTHOM			

Remarks

Database Information

Equipment Name	Main Transformer

1. Name of Substation : UKUWELA

(Address : Ceylon Electricity Board, Ukuwela)

2. Number of Units & Capacity : 2 x 15 MVA

3. Particulars :

Items \ Data		Unit Number			
		No. 1	No. 2	No. 3	No. 4
(1) Number of Phase		3 phase	3 phase		
(2) Capacity	(MVA)	15	15		
(3) Rated Voltage	(kV)	132/33	132/33		
(4) Basic Insulation Level	(kV)	N/A	N/A		
(5) Impedance	(%/MVA)	10.05/15	9.92/15		
Primary - Secondary	(%/MVA)				
Primary - Tertiary	(%/MVA)				
Secondary - Tertiary	(%/MVA)				
(6) Connection Symbol		Yndl	Yndl		
(7) Cooling System		ONAF	ONAF		
(8) Number of Taps		10	10		
(9) Voltage Range		+5% -15%	+5% -15%		
(10) Weight - Total	(tons)	N/A	N/A		
- Transportation	(tons)	N/A	N/A		
(11) Year of Manufacturer		1968	1968		
(12) Manufacturer		CEM	CEM		

Remarks

Database Information

Equipment Name	Main Circuit Braker

1. Name of Substation : UKUWELA (1/2)
2. Number of Units : 9
3. Particulars :

Items \ Data		Identification Number			
		D120	D110	152-1/152-2 /152-3/152-4 /152/-5	D52
(1) Type		ELF nc1rtv SF6 CB	OR1G CB	OR1G CB	140 PO OIL CB
(2) Rated Voltage	(kV)	132	132	132	145
(3) Rated Current	(A)	2000	1250	1250	600
(4) Rated Interrupting Current	(kA/MVA)	25/5700	15.3/3500	11/2500	12.5/2500
(5) Making Current	(kA)	N/A	38	28	31.5
(6) Rated Short Time Withstand Current/Duration	(kA/S)	N/A	15.3/1	11/1	(N/A)/3 CYCLES
(7) Basic Insulation Level	(kV)	550	550	550	N/A
(8) Total Weight	(kg)	N/A	2788	2788	4600
(9) Year of Manufacturer		1981	1975	1973	1977
(10) Manufacturer		BBC	N/A	N/A	TAKAOKA ELECT CO. TOKYO

Remarks

Database Information

Equipment Name	Main Circuit Braker
1. Name of Substation :	UKUWELA (2/2)
2. Number of Units :	9
3. Particulars :	

Items \ Data		Identification Number			
		152 - 8			
(1) Type		N/A			
(2) Rated Voltage	(kV)	N/A			
(3) Rated Current	(A)	N/A			
(4) Rated Interrupting Current	(kA/MVA)	N/A			
(5) Making Current	(kA)	N/A			
(6) Rated Short Time Withstand Current/Duration	(kA/S)	N/A			
(7) Basic Insulation Level	(kV)	N/A			
(8) Total Weight	(kg)	N/A			
(9) Year of Manufacturer		N/A			
(10) Manufacturer		N/A			

Remarks

Database Information

Equipment Name	Main Transformer

1. Name of Substation : OLD LAXAPANA

(Address : Ceylon Electricity Board, Laxapana)

2. Number of Units & Capacity : 1 x 13.33 MVA

3. Particulars :

Items \ Data		Unit Number			
		No. 1	No. 2	No. 3	No. 4
(1) Number of Phase				3 phase	
(2) Capacity	(MVA)			13.33	
(3) Rated Voltage	(kV)			(132/√3)/11	
(4) Basic Insulation Level	(kV)			550	
(5) Impedance	(%/MVA)			12.5/13.33	
Primary - Secondary	(%/MVA)				
Primary - Tertiary	(%/MVA)				
Secondary - Tertiary	(%/MVA)				
(6) Connection Symbol				N/A	
(7) Cooling System				ONAN/ONAF	
(8) Number of Taps				13	
(9) Voltage Range				+10% -10%	
(10) Weight - Total	(tons)			9.9	
- Transportation	(tons)			8.55	
(11) Year of Manufacturer				1989	
(12) Manufacturer				ALSTHOM	

Remarks

Database Information

Equipment Name	Main Circuit Braker
1. Name of Substation :	OLD LAXAPANA
2. Number of Units :	12
3. Particulars :	

Items \ Data		Identification Number			
		CB1/CB2	ALL OTHER BREAKERS		
(1) Type		FX11	HLR145 /2501E1		
(2) Rated Voltage	(kV)	N/A	145		
(3) Rated Current	(A)	3150	2500		
(4) Rated Interrupting Current	(kA/MVA)	31.5/(N/A)	31.5/7200		
(5) Making Current	(kA)	80	79		
(6) Rated Short Time Withstand Current/Duration	(kA/S)	31.5/3	31.5/3		
(7) Basic Insulation Level	(kV)	650	650/275		
(8) Total Weight	(kg)	1300	2350		
(9) Year of Manufacturer		1989	1985		
(10) Manufacturer		ALSTHOM	ASEA		

Remarks

Database Information

Equipment Name	Main Transformer

1. Name of Substation : NEW LAXAPANA

(Address : Ceylon Electricity Board, Laxapana (New))

2. Number of Units & Capacity : 2 x 72 MVA

3. Particulars :

Items \ Data		Unit Number			
		No. 1	No. 2	No. 3	No. 4
(1) Number of Phase		3 phase	3 phase		
(2) Capacity	(MVA)	72	72		
(3) Rated Voltage	(kV)	(132/√3)/12.5	(132/√3)/12.5		
(4) Basic Insulation Level	(kV)	550	550		
(5) Impedance	(%/MVA)	8.55/15	8.55/15		
Primary - Secondary	(%/MVA)				
Primary - Tertiary	(%/MVA)				
Secondary - Tertiary	(%/MVA)				
(6) Connection Symbol		N/A	N/A		
(7) Cooling System		ONAN/ONAF	ONAN/ONAF		
(8) Number of Taps		5	5		
(9) Voltage Range		+10%	+10%		
(10) Weight - Total	(tons)	40.86	40.86		
- Transportation	(tons)	N/A	N/A		
(11) Year of Manufacturer		1972	1972		
(12) Manufacturer		ALSTHOM SAVOISRENNE	ALSTHOM SAVOISRENNE		

Remarks

Database Information

Equipment Name	Main Circuit Braker

1. Name of Substation : NEW LAXAPANA
2. Number of Units : 9
3. Particulars :

Items \ Data		Identification Number			
		32-6	ALL OTHER BREAKERS 32-10 /32-9/32-8/32-7 /32-5/32-3		
(1) Type		FLX145	HLR145 /2501E1		
(2) Rated Voltage	(kV)	145	145		
(3) Rated Current	(A)	3000	2500		
(4) Rated Interrupting Current	(kA/MVA)	40/9100	31.5/7200		
(5) Making Current	(kA)	100	79		
(6) Rated Short Time Withstand Current/Duration	(kA/S)	40/3	31.5/3		
(7) Basic Insulation Level	(kV)	650	650/275		
(8) Total Weight	(kg)	3870	2350		
(9) Year of Manufacturer		1981	1985		
(10) Manufacturer		ALSTHOM	ASEA		

Remarks

Database Information

Equipment Name	Main Transformer

1. Name of Substation : SAMANALAWEWA

(Address : Samanalawewa Power Station, Handagiriya)

2. Number of Units & Capacity : 2 x 71 MVA

3. Particulars :

Items \ Data		Unit Number			
		No. 1	No. 2	No. 3	No. 4
(1) Number of Phase		3 phase	3 phase		
(2) Capacity	(MVA)	71	71		
(3) Rated Voltage	(kV)	138/10.5	138/10.5		
(4) Basic Insulation Level	(kV)	650	650		
(5) Impedance	(%/MVA)	10.89/(N/A)	10.89/(N/A)		
Primary - Secondary	(%/MVA)				
Primary - Tertiary	(%/MVA)				
Secondary - Tertiary	(%/MVA)				
(6) Connection Symbol		Yndll	Yndll		
(7) Cooling System		ONAN/ONAF	ONAN/ONAF		
(8) Number of Taps		5	5		
(9) Voltage Range		+7.5% -2.5%	+7.5% -2.5%		
(10) Weight - Total	(tons)	N/A	N/A		
- Transportation	(tons)	N/A	N/A		
(11) Year of Manufacturer		N/A	N/A		
(12) Manufacturer		GES ALSTHOM	GES ALSTHOM		

Remarks

Database Information

Equipment Name	Main Circuit Braker

1. Name of Substation : SAMANALAWEWA
2. Number of Units : 7
3. Particulars :

Items \ Data		Identification Number			
		L15/L25/L35/L45 /M15/M20/W10			
(1) Type		FG1Ab			
(2) Rated Voltage	(kV)	145			
(3) Rated Current	(A)	2500			
(4) Rated Interrupting Current	(kA/MVA)	31.5/7200			
(5) Making Current	(kA)	79			
(6) Rated Short Time Withstand Current/Duration	(kA/S)	31.5/1			
(7) Basic Insulation Level	(kV)	650			
(8) Total Weight	(kg)	N/A			
(9) Year of Manufacturer		1985			
(10) Manufacturer		GES ALSTHOM			

Remarks

Database Information

Equipment Name	Main Transformer

1. Name of Substation : WIMALASURENDRA

(Address : Ceylon Electricity Board, Norton Bridge)

2. Number of Units & Capacity : 2 x 31.5 MVA

3. Particulars :

Items \ Data		Unit Number			
		No. 1	No. 2	No. 3	No. 4
(1) Number of Phase		3 phase	3 phase		
(2) Capacity	(MVA)	31.5	31.5		
(3) Rated Voltage	(kV)	132/33	132/33		
(4) Basic Insulation Level	(kV)	170	170		
(5) Impedance	(%/MVA)	10.3/31.5	N/A		
Primary - Secondary	(%/MVA)				
Primary - Tertiary	(%/MVA)				
Secondary - Tertiary	(%/MVA)				
(6) Connection Symbol		Yndl	Yndl		
(7) Cooling System		ONAN/ONAF	ONAN/ONAF		
(8) Number of Taps		16	16		
(9) Voltage Range		+10% -15%	+10% -15%		
(10) Weight - Total	(tons)	44.0	44.0		
- Transportation	(tons)	38.0	38.0		
(11) Year of Manufacturer		1989	1989		
(12) Manufacturer		ALSTHOM	ALSTHOM		

Remarks

Database Information

Equipment Name	Main Circuit Braker

1. Name of Substation : WIMALASURENDRA
2. Number of Units : 8
3. Particulars :

Items \ Data		Identification Number			
		170	H10/L15/L20 /L25/S10	M20/M10	
(1) Type		EP36-25C	FX11	ELF145cc1rt	
(2) Rated Voltage	(kV)	N/A	132	132	
(3) Rated Current	(A)	N/A	3150	2000	
(4) Rated Interrupting Current	(kA/MVA)	25/(N/A)	31.5/7200	25/5700	
(5) Making Current	(kA)	62.5	80	N/A	
(6) Rated Short Time Withstand Current/Duration	(kA/S)	25/3	31.5/3	N/A	
(7) Basic Insulation Level	(kV)	170	650	550	
(8) Total Weight	(kg)	N/A	1300	N/A	
(9) Year of Manufacturer		1989	1989	1981	
(10) Manufacturer		ALSTHOM	ALSTHOM	BBC	

Remarks

A11.3 通信設備に関するデータベース

表A11.3 - 1　既設PLCシステムデータ
表A11.3 - 2　既設PLCシステム直流電源データ

表 A11.3 - 1 既設PLCシステムデータ (1/5)

Voltage/ Line No.	Transmission Line: Station from/to station	Distance (km)	Power Line Carrier (PLC): Type	TX/RX (kHz)	CH	Watt	Serial No.	Operation Year	Teleprotection: Type/Scheme	CH in PLC	Q'ty	Operation Year	PLTS: Q'ty	CH in PLC	Operation Year	PAX: Q'ty	CH in PLC	Operation Year	Line Trap: Current (A)	Inductance (mH)	Blocking freq (kHz)	Phase	Q'ty	Operation Year	CVT/CC: Capacitance	1st Coupling device: Type	Passing freq (kHz)	Remarks
220 kV	Kotugoda	19.6	ET122	456-464/464-472	2	20			—	—	—	—	—	—	—	—	—	—										
2L.1	Biyagama	2 cct	ET122	464-472/456-464	2	20			—	—	—	—	—	—	—	—	—	—										
〃	Kotugoda	〃	ET121	268-272/272-276	1	20			—	—	—	—	—	—	—	—	—	—										
	Biyagama		ET121	272-276/268-272	1	20			—	—	—	—	—	—	—	—	—	—										
220 kV	Biyagama	70.5	ET122	96-104/104-112	2	20							1	2		1	1											
2L.2	Kotmale	2 cct	ET122	104-112/96-104	2	20							1	2		1	1											
〃	Biyagama	〃	ET121	120-124/124-128	1	20							—	—	—	1	1											
	Kotmale		ET121	124-128/120-124	1	20							—	—	—	1	1											
220 kV	Kotamale	30.1	ET122	128-136/136-144	2	20							1	2		1	1											
2L.3	Victoria	2 cct	ET122	136-144/128-136	2	20							1	2		1	1											
〃	Kotamale	〃	ET121	112-116/116-120	1	20							—	—	—	1	1											
	Victoria		ET121	116-120/112-116	1	20							—	—	—	1	1											
220 kV	Victoria	16.4	ET122	160-168/168-176	2	20							1	2		1	1											
2L.4	Randenigala	1 cct	ET122	168-176/160-168	2	20							1	2		1	1											
〃	Victoria	〃	ET121	144-148/148-152	1	20							—	—	—	1	1											
	Randenigala		ET121	148-152/144-148	1	20							—	—	—	1	1											
220 kV	Randenigala	3.1	ET122	352-360/360-368	2	20							1	2		1	1											
2L.5	Rantembe	1 cct	ET122	360-368/352-360	2	20							1	2		1	1											

表 A11.3 - 1 既設PLCシステムデータ (2/5)

Voltage/ Line No.	Transmission Line: Station from/to Station	Distance (km)	Power Line Carrier (PLC): Type	TX/RX (kHz)	CH	Watt	Serial No.	Operation Year	Teleprotection: Type/Scheme	CH in PLC	Qty	Operation Year	PLTS: Qty	CH in PLC	Operation Year	PAX: Qty	CH in PLC	Operation Year	Line trap: Current (A)	Inductance (mH)	Blocking freq (kHz)	Phase	Qty	Operation Year	CVT/CC: Capacitance	HF Coupling device: Type	Passing freq (kHz)	Remarks
132 kV	Biyagama	15.5	ET122	308-316/316-324	2	20							—	—	—	1	1											
IL.1	Pannipitiya	2 cct	ET122	316-324/308-316	2	20							—	—	—	1	1		1600	0.2	270-502		2		5600pF			
132 kV	Biyagama	12.5	ET122	240-248/248-256	2	20							1	2		1	1											
IL.2	Kelanitissa	2 cct	ET122	248-256/240-248	2	20							1	2		1	1					Y	2					
132 kV	Kolonnawa	2.2	ET122	208-216/216-224	2	20							1	1		1	2					R	2		6510pF	MCD80	7-500	
IL.4	Kelanitissa	2 cct	ET122	216-224/208-216	2	20							1	1		1	2					R	2					
132 kV	Kolonnawa	12.9	ET122	224-232/232-240	2	20							1	1		1	2					Y	2					
IL.5	Pannipitiya	2 cct	ET122	232-240/224-232	2	20							1	1		1	2								5600pF			
132 kV	Kolonnawa	11.2	ET122	276-284/284-292	2	20							1	1		1	2					Y	2					
IL.6	Sapugaskanda (T)	2 cct	ET122	284-292/276-284	2	20							1	1		1	2											
132 kV	Kolonnawa - Sapugaskanda (T)	23.3	ET122	292-300/300-308	2	20							1	1		1	2								5575pF	MCD80	116-410	
IL.7	Kotugoda	2 cct	ET122	300-308/292-300	2	20							1	1		1	2											
132 kV	Kotugoda	21.0	ETB	204-208/200-204	1	15							—	—	—	1	1											
IL.9	Balawatta (T)	2 cct	ETB	200-204/204-208	1	15			NSD41		1		—	—	—	1	1											
"	Kotugoda	"	ETB	216-220/208-212	1	15							1	1		—	—	—										
	Balawatta (T)		ETB	208-212/216-220	1	15							1	1		—	—	—										
132 kV	Kotugoda - Bolawatta - Chilaw	105.0	ET122	308-316/316-324	2	20							1	1		1	1											
IL.9-11	Puttalam	2 cct	ET122	316-324/308-316	2	20			NSD41		1		1	1		1	1											By TSADP
132 kV	Bolawatta (T)	84.0	ETL41	260-264/256-260	1	40							—	—	—	1	1											
IL.10-11	Puttalam	2 cct	ETL41	256-260/260-264	1	40							—	—	—	1	1											By TSADP
132 kV	Kotugoda - Bolawatta (T)	50.4		480-488/472-480	2																							
IL.9-12	Chilaw (T)	2 cct		472-480/480-488	2																							By PDTP
132 kV	Kolonnawa	17.4	ET122	352-360/360-368	2	20							1	1		—	—	—				Y	2					
IL.13-14	Oruwala (T)	2 cct	ET122	360-368/352-360	2	20							1	1		—	—	—										
132 kV	Thulhiriya (T)	28.0	ET122	424-432/432-440	2	20							1	1		1	1											
IL.16-17	Polpitiya	2 cct	ET122	432-440/424-432	2	20							1	1		1	1											
132 kV	Kolonnawa	32.4	ET122	136-144/128-136	2	20													400	0.2	116-200	Y	2		5575pF	MCD80	116-500	
IL.18-19	Avissawella (T)	2 cct	ET122	128-136/136-144	2	20													800	0.2	116-148					MCD80	70-500	By TSADP
132 kV	Avissawella (T)	34.9	ET121	124-128/120-124	1	20													800	0.2	116-148					MCD80	70-500	By TSADP
IL.19-20	Polpitiya	2 cct	ET121	120-124/124-128	1	20													400	0.2	116-200					MCD80	70-500	
132 kV	Kolonnawa	66.3	ET122	336-344/328-336	2	20							1	2		1	1		400	0.2	116-200					MCD80	70-500	
IL.18-20	Polpitiya	2 cct	ET122	328-336/336-344	2	20							1	2		1	1		400	0.2	116-200					MCD80	70-500	
"	Kolonnawa	"	ET121	412-416/404-408	1	20							1	1		—	—	—										
	Polpitiya		ET121	404-408/412-416	1	20							1	1		—	—	—										
"	Kolonnawa	"	ETB	160-164/156-160	1	15																						
	Polpitiya		ETB	156-160/160-164	1	15																						

表 A11.3 - 1 既設PLCシステムデータ (3/5)

Voltage/ Line No.	Transmission Line: Station (from/to station)	Distance (km)	Power Line Carrier (PLC): Type	TX/RX (kHz)	CH	Watt	Signal No.	Operation Year	Teleprotection: Type/Scheme	CH in PLC	Qty	Operation Year	PLTS: Qty	CH in PLC	Operation Year	PAX: Qty	CH in PLC	Operation Year	Line trap: Current (A)	Inductance (mH)	Blocking freq. (kHz)	Phase	Qty	Operation Year	CVT/CC: Capacitance	HF Coupling device: Type	Passing freq. (kHz)	Remarks
132 kV	Kolonnawa	66.3	ETB	144-148/148-152	1	15							1	1		—	—	—										
1L.18-20	Polpitiya	2 cct	ETB	148-152/144-148	1	15							1	1		—	—	—										
132 kV	Kolonnawa	74.6	ETI102	176-184/184-192	2	100							1	1		1	2											
1L.18-25	Laxapana	2 cct	ETI102	184-192/176-184	2	100							1	1		1	2											
132 kV	Pannipitiya	6.9	ETI22	72-80/80/88	2	20							1	1		1	2		800	0.2	72-88		2		5600pF			
1L.21	Ratmalana	2 cct	ETI22	80-88/72-80	2	20							1	1		1	2											
132 kV	Pannipitiya	17.0	ETI22	292-300/300-308	2	20			NSD41		1		1	1		1	2											
1L.22-24	Panadura (T)	2 cct	ETI22	300-308/292-300	2	20			NSD41		1		1	1		1	2		800	0.2	156-290		2	1996	6nF	MCD80	70-500	By TSADP
132 kV	Panadura (T)	33.8	ETL41	204-208/200-204	1	40			—	—	—	—	—	—		1	1		800	0.2	156-290		2	1996	6nF	MCD80	70-500	By TSADP
1L.23	Matugama	2 cct	ETL41	200-204/204-208	1	40							—	—		1	1		800	0.2	200-490		2					
132 kV	Pannipitiya	41.4	ETI22	264-272/256-264	2	20			NSD41		1		1	1		1	2		800	0.2	204-314		2		5600pF			
1L.22-24	Matugama	2 cct	ETI22	256-264/264-272	2	20			NSD41		1		1	1		1	2		800	0.2	200-490		2					
132 kV	Polpitiya	8.3	ETB	168-172/164-168	1	15							—	—	—	1	1											
1L.25	Laxapana	2 cct	ETB	164-168/168-172	1	15							—	—	—	1	1											
"	Polpitiya	"	ETI21	204-208/200-204	1	20							1	1		—	—	—										
	Laxapana		ETI21	200-204/204-208	1	20							1	1		—	—	—										
132 kV	Laxapana	5.1	ETI22	248-256/240-248	2	20							1	1		1	2											
1L.26	Wimalasurendra	2 cct	ETI22	248-256/240-248	2	20							1	1		1	2											
132 kV	Old Laxapana	0.6	ETB	192-196/196-200	1	15							—	—	—	1	1											
1L.27	(New) Laxapana	2 cct	ETB	196-200/192-196	1	15							—	—	—	1	1											
132 kV	Laxapana	10.0	ETI22	316-324/308-316	2	20							1	1		1	2											
1L.29	Canyon	1 cct	ETI22	308-316/316-324	2	20							1	1		1	2											
132 kV	Polpitiya	29.5	ETI22	80-88/72-80	2	20							1	1		1	2											
1L.30	Kotmale	1 cct	ETI22	72-80/80-88	2	20							1	1		1	2											
132 kV	Kotmale	22.5	ETI22	288-296/296-304	2	20							1	1		1	2											
1L.31	Kirihathkumbura	1 cct	ETI22	296-304/288-296	2	20							1	1		1	2											
132 kV	Kirihathkumbura	143.9	ETI101	308-312/304-308	1	100							1	1		—	—	—										
1L.32	Anuradhapura	1 cct	ETI101	304-308/308-312	1	100							1	1		—	—	—										
"	Kirihathkumbura	"	ETI101	324-328/320-324	1	100							—	—	—	1	1											
	Anuradhapura		ETI101	320-324/324-328	1	100							—	—	—	1	1											
132 kV	Polpitiya	59.3	ETI22	244-252/252-260	2	20							1	1		1	2											
1L.33	Ukuwela	1 cct	ETI22	252-260/244-252	2	20							1	1		1	2											
132 kV	Habarana	48.9	ETB	284-288/268-272	1	15							1	1		—	—	—										
1L.35	Anuradhapura	1 cct	ETB	268-272/284-288	1	15							1	1		—	—	—										
"	Habarana	"	ETB	236-240/208-212	1	15							—	—	—	1	1											
	Anuradhapura		ETB	208-212/236-240	1	15							—	—	—	1	1											

表 A11.3 - 1 既設PLCシステムデータ (4/5)

Voltage/ Line No	Transmission Line: Station from/to station	Distance (km)	Power Line Carrier (PLC): Type	TX/RX (kHz)	CH	Watt	Serial No.	Operation Year	Teleprotection: Type/Scheme	CH in PLC	Q'ty	Operation Year	PLTS: Q'ty	CH in PLC	Operation Year	PAX: Q'ty	CH in PLC	Operation Year	Line trap: Current (A)	Inductance (mH)	Blocking freq (kHz)	Phase	Q'ty	Operation Year	CVT/CC: Capacitance	HF Coupling device: Type	Passing freq (kHz)	Remarks
132 kV	Ukuwela - Habarana (CF bypass) -	131.2	ETI102	216-224/224-232	2	100																						
IL 34-35	Anuradhapura	1 cct	ETI102	224-232/216-224	2	100																						
132 kV	Ukuwela	30.0	ETB	440-444/444-448	1	15							1	1		—	—	—										
1L.36	Bowatenna	1 cct	ETB	444-448/440-444	1	15							1	1		—	—	—										
〃	Ukuwela	〃	ETB	452-456/448-452	1	15							—	—	—	1	1											
	Bowatenna		ETB	448-452/452-456	1	15							—	—	—	1	1											
132 kV	Kinbathkumbura	34.6	ETI22	176-184/184-192	2	20							1	1		1	2											
1L.37	Kurunegala	2 ccts	ETI22	184-192/176-184	2	20							1	1		1	2											
132 kV	Anuradhapura	103.3	ETBB	344-352/336-344	2	15							1	1		1	2											
1L.39	Trincomalee	2 ccts	ETBB	336-344/344-352	2	15							1	1		1	2											
132 kV	Laxapana	43.9	ETI22	300-308/292-300	2	20							1	1		1	2											
1L.40	Balangoda	2 ccts	ETI22	292-300/300-308	2	20							1	1		1	2											
132 kV	Balangoda	19.0	ETI22	348-356/340-348	2	20							1	2		1	1											
1L.41	Samanalawewa	2 ccts	ETI22	340-348/348-356	2	20							1	2		1	1											
132 kV	Samanalawewa	38.0	ETI22	412-420/404-412	2	20							1	2		1	1											
1L.42	Embilipitiya	2 ccts	ETI22	404-412/412-420	2	20							1	2		1	1											
132 kV	Balangoda	44.2	ETI22	316-324/308-316	2	20							1	2		1	1											
1L.43	Deniyaya (T)	2 cccts	ETI22	308-316/316-324	2	20							1	2		1	1											
132 kV	Balangoda - Deniyaya (T) -	57.3	ETI102	324-332/332-340	2	100							1	1		1	2											
1L.44	Galle	2 cccts	ETI102	332-340/324-332	2	100							1	1		1	2											
132 kV	Rantembe	37.0	ETI22	176-184/184-192	2	20							—	—	—	1	1											
1L.45	Badulla	1 cct	ETI22	184-192/176-184	2	20							—	—	—	1	1											
132 kV	Badulla	77.9	ETI22	192-200/200-208	2	20			NSD41		1		1	1		1	2											
1L.46	Ingiriyagala	1 cct	ETI22	200-208/192-200	2	20			NSD41		1		1	1		1	2											
132 kV	Anuradhapura	128.8	ETI102	200-208/192-200	2	100							1	1		1	2											
1L.47	Kilinochchi (T)	2 cccts	ETI102	192-200/200-208	2	100							1	1		1	2											
132 kV	Kilinochchi (T)	67.2	ETB	244-248/252-256	1	15							1	1		—	—	—										
1L.48	Chunnakam	2 cccts	ETB	252-256/244-248	1	15							1	1		—	—	—										
〃	Kilinochchi (T)	〃	ETB	236-240/228-232	1	15							—	—	—	1	1											
	Chunnakam		ETB	228-232/236-240	1	15							—	—	—	1	1											

Note Two-(2) sets of blocking frequency of 232-420 [kHz] are supplied for Nuwra Eliya (132 kV) by TSADP.

表 A11.3 - 1 既設PLCシステムデータ (5/5)

Voltage/ Line No.	Transmission Line: Station from/to station	Distance (km)	Power Line Carrier (PLC): Type	TX/RX (kHz)	CH	Watt	Serial No.	Operation Year	Teleprotection: Type/Scheme	CH in PLC	Qty	Operation Year	PLTS: Qty	CH in PLC	Operation Year	PAX: Qty	CH in PLC	Operation Year	Line trap: Current (A)	Inductance (mH)	Blocking freq. (kHz)	Phase	Qty	Operation Year	CVT/CC: Capacitance	HF Coupling device: Type	Passing freq. (kHz)	Remarks
66 kV	Kotmnawa		ETB	168-172/172-176	1	15			—	—	—	—	1	1		—	—	—										
1L.1	Padukka (T)	2 cct	ETB	172-176/168-172	1	15			—	—	—	—	1	1		—	—	—										
〃	Kotmnawa	〃	ETB	196-200/192-196	1	15			—	—	—	—	—	—	—	1	1											
	Padukka (T)		ETB	192-196/196-200	1	15			—	—	—	—	—	—	—	1	1											
66 kV	Padukka (T)		ETI21	456-460/460-464	1	20			—	—	—	—	—	—	—	—	—	—										
1L.2	Avissawella (T)	2 cct	ETI21	460-464/456-460	1	20			—	—	—	—	—	—	—	—	—	—										
66 kV	Avissawella (T)		ETI22	208-216/216-224	2	20			—	—	—	—	1	1		1	2											
1L.3	Laxapana	2 cct	ETI22	216-224/208-216	2	20			—	—	—	—	1	1		1	2											
66 kV	Laxapana		ETI22	144-152/152-160	2	20			—	—	—	—	1	1		1	2											
1L.4	Norton Bridge (T)	2 cct	ETI22	152-160/144-152	2	20			—	—	—	—	1	1		1	2											
66 kV	Norton Bridge (T)		ETI22	260-268/268-276	2	20			—	—	—	—	1	1		1	2											
1L.5	Nuwara Eliya (T)	2 cct	ETI22	268-276/260-268	2	20			—	—	—	—	1	1		1	2											
66 kV	Nuwara Eliya (T)		ETI22	160-168/168-176	2	20			—	—	—	—	1	1	—	1	2											
1L.6	Badulla	2 cct	ETI22	168-176/160-168	2	20			—	—	—	—	1	1	—	1	2											
33 kV	Balangoda		ETB	200-204/204-208	1	15			—	—	—	—	1	1		—	—	—										
1L.1	Uda Walawe	2 cct	ETB	204-208/200-204	1	15			—	—	—	—	1	1		—	—	—										
〃	Balangoda	〃	ETB	172-176/176-180	1	15			—	—	—	—	—	—	—	1	1											
	Uda Walawe		ETB	176-180/172-176	1	15			—	—	—	—	—	—	—	1	1											

表 A11.3 - 2　既設PLCシステム直流電源データ (1/3)

No.	Name of station	Battery			Battery charger			Distribution board/circuits				Load data		Required capacity	
		Type	Capacity	Operation year	Type	Capacity	Operation year	Used circuits	Rating [A/AF]	Equipped circuits	Rating [A/AF]	Existing [A]	Additional [A]	Battery	Charger
1	Kotugoda	Pb/Ac	200 Ah		Systronic	60A									
2	Biyagama	Ni-Cd	200 Ah		Systronic	60A									
3	Kotmale	Pb/Ac	700 Ah		PS DC										
4	Victoria	Ni/Cd	105 + 200 Ah		Systronic	40 + 80 A									
5	Randenigla	Pb/Ac			PS DC										
6	Rantembe	Pb/Ac			PS DC										
7	Sapugaskanda DPS	Ni/Cd	170 Ah		Systronic	60A									
8	Bolawatta	Pb/Ac	120 Ah		Gutor	40A									
9	Puttalam	Pb/Ac	120 Ah		Gutor	40A									
10	Chillaw : PDTP				Nife										
11	Kolonnawa	Pb/Ac	120 Ah		EAO	40 A									
12	Sapugaskanda	Pb/Ac	120 Ah		Gutor	40 A									
13	Pannipitiya	Pb/Ac	200 Ah		Systronic	40 A									
14	Ratamalana	Pb/Ac	90 Ah		Electrona	15 A									
15	Matugama	Pb/Ac	120 Ah		Orelikon	40 A									
16	Fort (Future)														
17	Kollpitiya (Future)														
18	Kelanitissa	Pb/Ac	210 Ah		Gutor	40A									
19	Padukka (66 kV)				Gutor										
20	Avissawella : TSADP	Ni/Cd	100 Ah	1996	Apollon-Diamond	25 A	1996	3	10 A 2P	6	10 A 2P	12 (4 A x 3)		Minimum 100 Ah	

Note

1 Pb/Ac and Ni/Cd denotes Lead-Acid and Nickel-Cadmium respectively.

2 Time of power stopping at station is required for battery capacity calculation.
TSADP : 8 hours is guarantee time at 80 % charged.

表 A11.3 - 2　既設PLCシステム直流電源データ (2/3)

No.	Name of station	Battery			Battery charger			Distribution board/circuits				Load data		Required capacity	
		Type	Capacity	Operation year	Type	Capacity	Operation year	Used circuits	Rating [A/AF]	Equipped circuits	Rating [A/AF]	Existing [A]	Additional [A]	Battery	Charger
21	Oruwala				EAO										
22	Polipitiya	Pb/Ac	400 Ah x 2		Statron	105 A									
23	Thulihiriya	Pb/Ac	120 Ah		OLTEN	40 A									
24	Ukuwela	Pb/Ac	400 Ah		Gutor	40 A									
25	Bowatenna	Pb/Ac	200 Ah		Orelikon	40 A									
26	Anuradhapura	Pb/Ac	300 Ah		Statron	85 A									
27	Kiribathkumbra	Ni/Cd	170 Ah		Systronic	60 A									
28	Kurunegala	Ni/Cd	170 Ah		Systronic	60 A									
29	Trincomalee	Pb/Ac	90 Ah		Orelikon	40 A									
30	Kikinochchi	Pb/Ac	120 Ah		Gutor	40 A									
31	Chunnakam	Pb/Ac	120 Ah		Gutor	40 A									
32	Habarana	Ni/Cd	200 Ah		Systronic	60 A									
33	New Laxapana	Pb/Ac	400 Ah x 2		Statron	105 A									
34	Wimalasurenda	Pb/Ac	120 Ah		Gutor	40 A									
35	Canyon	Pb/Ac	200 Ah		Orelikon	40 A									
36	Balangoda		200 Ah		Systronic	40 A									
37	Deniyaya	Pb/Ac	120 Ah		Gutor	40 A									
38	Galle	Pb/Ac	120 Ah		Gutor	40 A									
39	Samanalawewa	Pb/Ac	1400 Ah		Yuasa										
40	Embilipitiya	Pb/Ac	170 Ah		Gutor	40 A									

Note

1 Pb/Ac and Ni/Cd denotes Lead-Acid and Nickel-Cadmium respectively.

2 Time of power stopping at station is required for battery capacity calculation.
TSADP : 8 hours is guarantee time at 80 % charged.

表 A11.3 - 2　既設PLCシステム直流電源データ (3/3)

No.	Name of station	Battery			Battery charger			Distribution board/circuits				Load data		Required capacity	
		Type	Capacity	Operation year	Type	Capacity	Operation year	Used circuits	Rating [A/AF]	Equipped circuits	Rating [A/AF]	Existing [A]	Additional [A]	Battery	Charger
41	Uda Walawe				EAO										
42	Norton Bridge (66 kV)				Gutor										
43	Nuwala Eliya : TSADP	Ni/Cd	100 Ah	1996	Apollon-Diamond	25 A	1996	4	10 A 2P	6	10 A 2P	12 (4 A x 3)		Minimum 100 Ah	
44	Inginiyagala				Gutor										
45	Badulla	Ni/Cd			Gutor	60 A									
46	Panadura : TSADP	Ni/Cd	100 Ah	1996	Apollon-Diamond	25 A	1996	3	10 A 2P	6	10 A 2P	12 (4 A x 3)		Minimum 100 Ah	
47	Matara : TGDP														

Note
1 Pb/Ac and Ni/Cd denotes Lead-Acid and Nickel-Cadmium respectively.
2 Time of power stopping at station is required for battery capacity calculation.
TSADP : 8 hours is guarantee time at 80 % charged.

第 A13 章

送電系統設備建設に伴う環境問題

第A13章　送電系統設備建設に伴う環境問題

A.13.1 電磁誘導電圧 (13.3.4節 電磁誘導参照)

送電線に零相電流が流れた場合、送電線と通信線の電線間の相互インダクタンスの作用により通信線に誘導電圧が誘起される。大地帰路回路における相互インダクタンスはカーソン・ポラチェックの式から求められる。しかし、この式は電流が地中に分布するので非常に複雑である。日本においてこの誘導電圧を求める一般式は下記である。

$$V = \lambda (\Sigma (lp \times Z_{mp}) + \Sigma (lc \times Z_{mc})) \times I$$

ただし、 λ ：遮蔽効果などによる低減係数

lp ：通信線の送電線への投影距離 (km)

I ：起誘導電流 (A)

lc ：送電線と通信線の交差個所における通信線の送電線への投影距離 (km)

Z_{mp} ： 両線路の平行または不平行区間における平均相互インピーダンス (ohm/km)。この値は相互インピーダンスと等価離隔距離 (dm') の関係を示す図A13.1-2より求められる。

dm', dc' ：標準大地導電率 (σ_0 = 0.01S/m) に対する等価間隔；大地導伝率がσ (S/m) の場合には、

$dm' = \sqrt{100\sigma} \times dm$,

$dc' = \sqrt{100\sigma} \times dc$ となる。

dm ：並行区間の離隔距離または不平行区間の平均離隔距離 (m)

dc ：交差区間の平均離隔距離 (m)

dc1, dc2 ：不平行区間の両端における離隔距離 (m)

dm = (d1 + d2) / 2

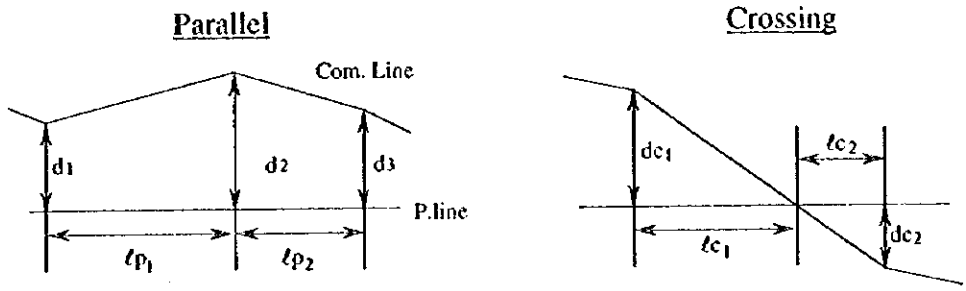
dc = (dc1 + dc2) / 2

図 A13.1-1 に送電線と通信線の相互関係を示した。相互離隔距離は地図上及び補助測量の結果によって求めるべきである。

日本においては標準大地抵抗を 100 ohm.cm とし、この抵抗は深層に至るまで均一であると仮定して上記相互インピーダンスを理論的計算で求めている。

大地抵抗が明らかな場合には、その値を使用し、不明な場合には測定値を使用すべきである。

送電線と通信線の離隔距離が5,000m以上の区間は、上記計算から除外してよい。



$$dm = \frac{1}{2}(d_1 + d_2)$$

$$dm' = \sqrt{100\,\sigma} \times dm$$

$$dc = \frac{1}{2}(dc_1 + dc_2)$$

$$dc' = \sqrt{100\,\sigma} \times dc$$

σ : Earth conductivity (s/m)

図 A13.1 - 1　送電線と通信線の相関関係図

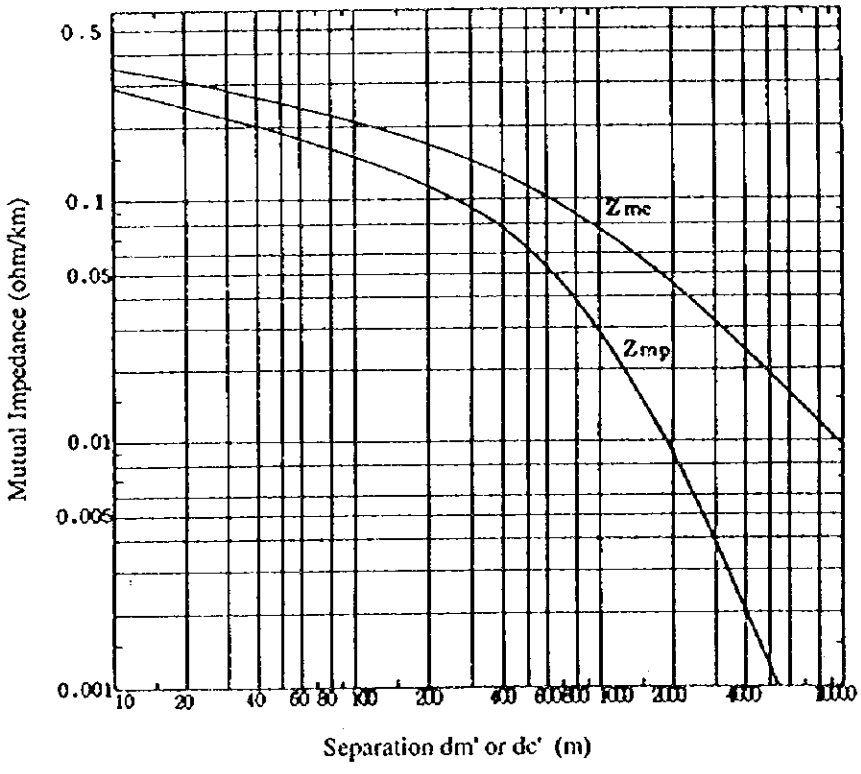


図 A13.1 - 2　相互インピーダンス図表

CEYLON ELECTRICITY BOARD	JAPAN INTERNATIONAL COOPERATION AGENCY NIPPON KOEI CO., LTD. Consulting Engineer	MASTER PLAN STUDY FOR DEVELOPMENT OF THE TRANSMISSION SYSTEM OF THE CEYLON ELECTRICITY BOARD IN THE DEMOCRATIC SOCIALIST REPUBRIC OF SRI LANKA	TITLE

JICA