


REFERENCE LIST:

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- [02] Annual Procurement Report, CEB, 2010.
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- [05] John C. Gravunder, “Transformer Fusing Protection and Coordination” Cooper Power Systems, September 1996.
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- [07] “Overcurrent Protection of Transformers, Traditional and New Fusing Philosophies for Small and Large Transformers”, S&C Electric Company, 2002-2003 News Archive  www.art.ac.lk
- [08] IEEE Std C57.109-1993, “IEEE Guide for Liquid-Immersed Transformer Through-Fault-Current Duration.
- [09] Lanka Transformers Limited, “Specification for Transformer Overcurrent Protection”, July 2004.
- [10] Catalogues, Brochures and Technical Documentation from several Manufactures: ABB, Cooper Power Systems, GE, A.B. Chance Company & Hubbel Power Systems.
- [11] Ceylon Electricity Board, “Investigation of Distribution Transformer Failures-Region 01” CEB, October 2004.
- [12] Ceylon Electricity Board – Distribution Planning and Development Branch – Region 4, “Selection of MV Fuses”, CEB, July 2006

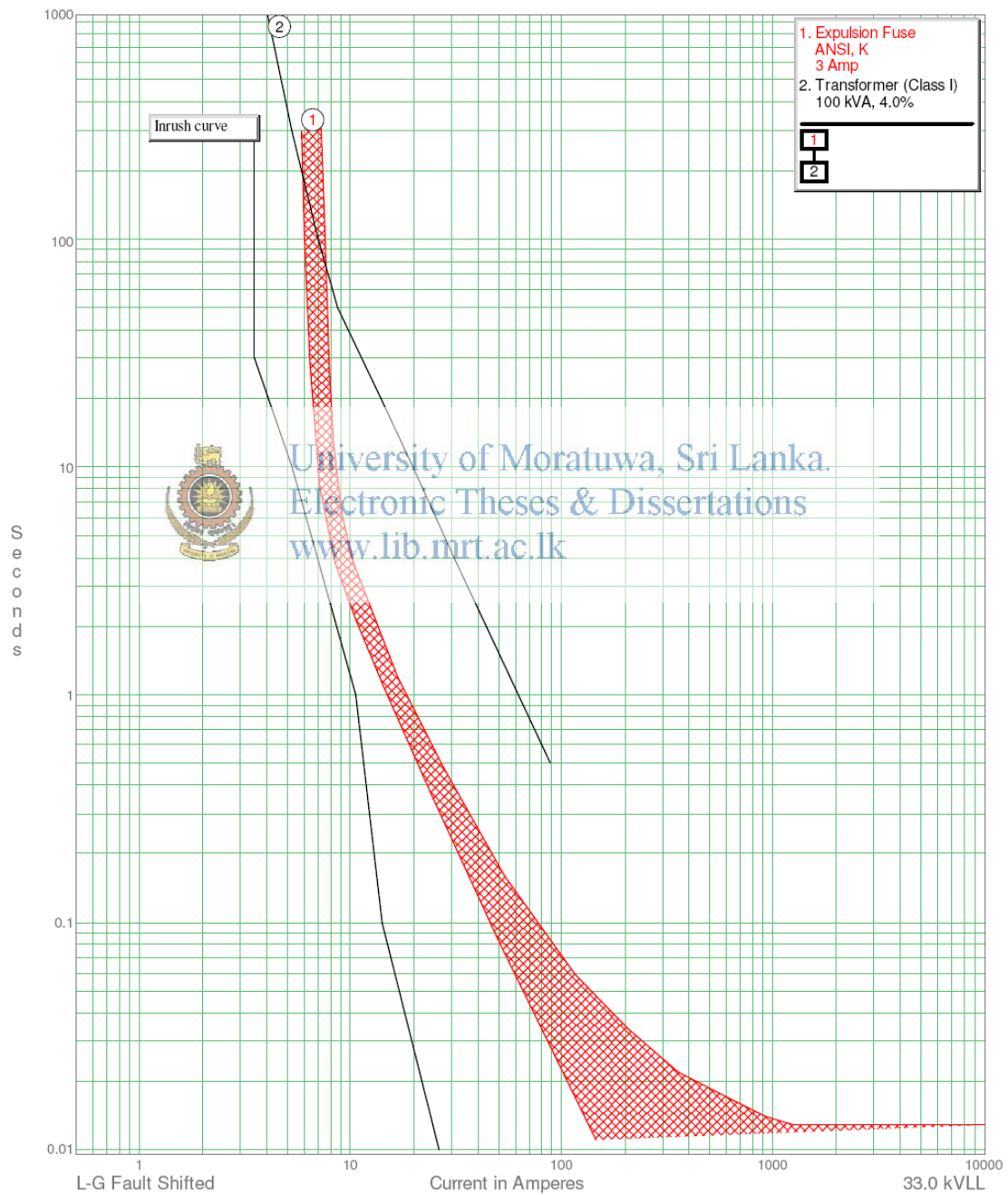
- [13] Ceylon Electricity Board, “CEB Standard 059:1997 - Specification for High Voltage Expulsion Fuse Links” CEB, 1997.
- [14] Break down reports-Southern Province, CEB, 2010.



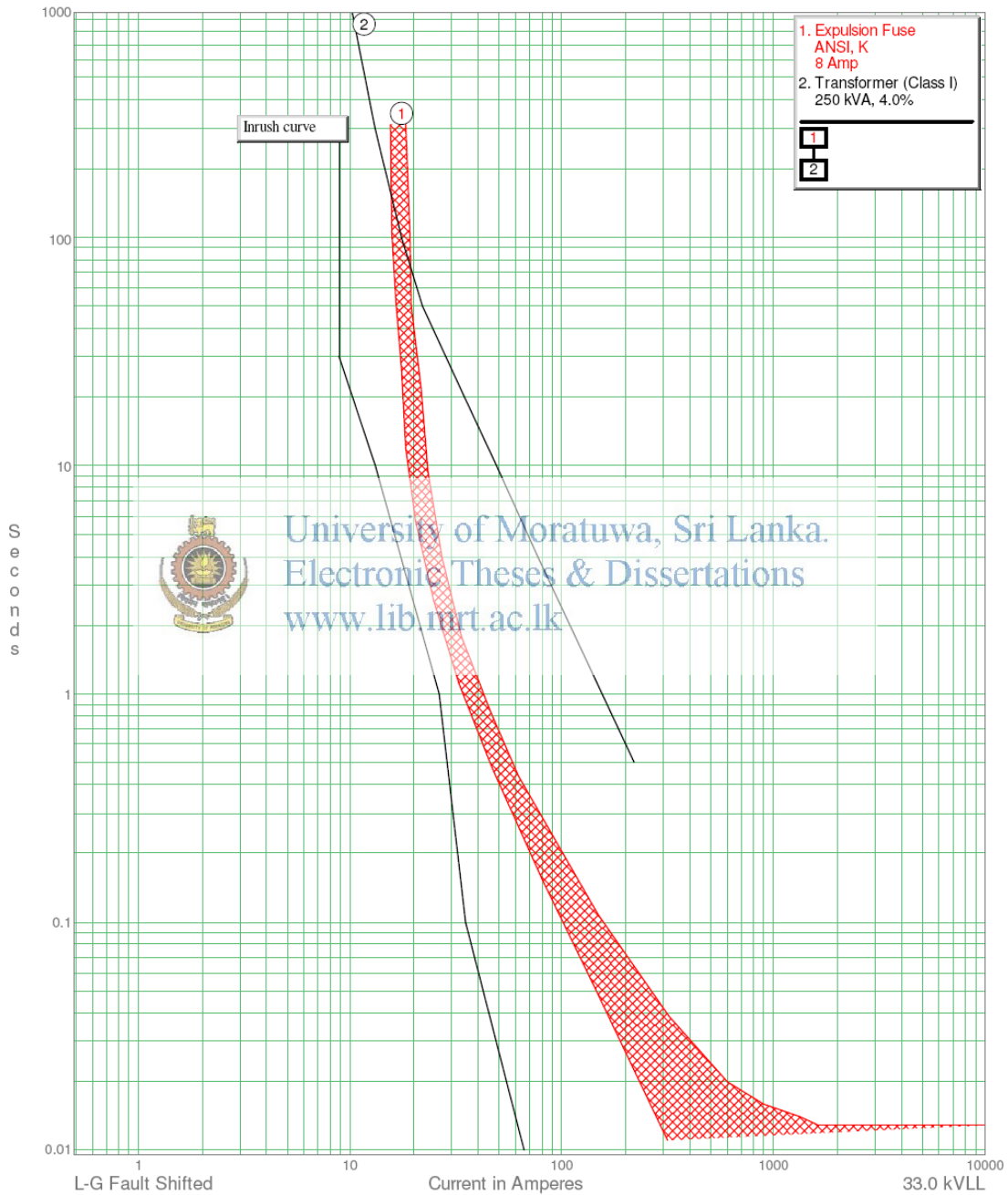
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K type Fuse Selection

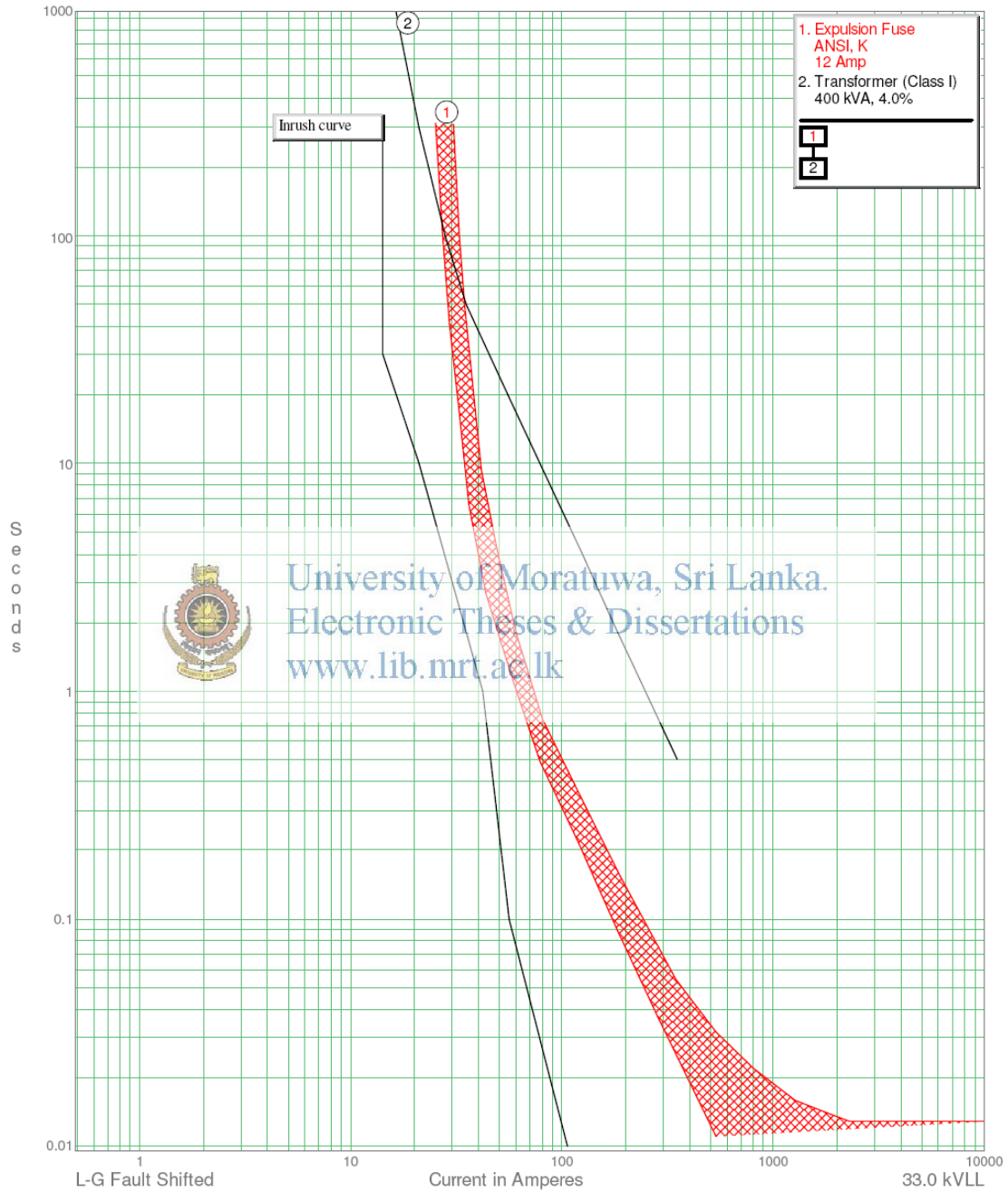
1. TCC for 100kVA 33/0.4kV transformer with 3A fuse



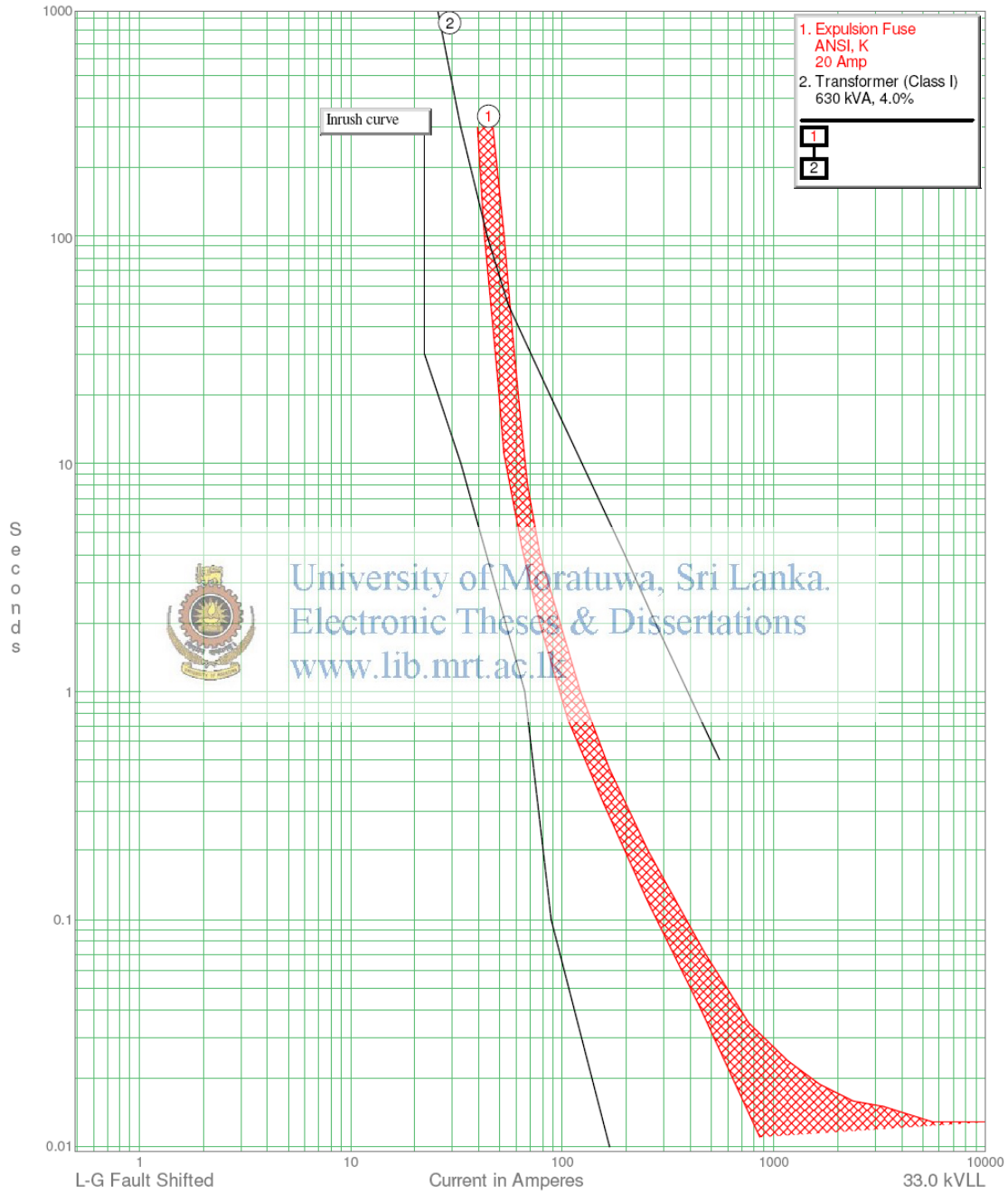
2. TCC for 250kVA 33/0.4kV transformer with 8A fuse



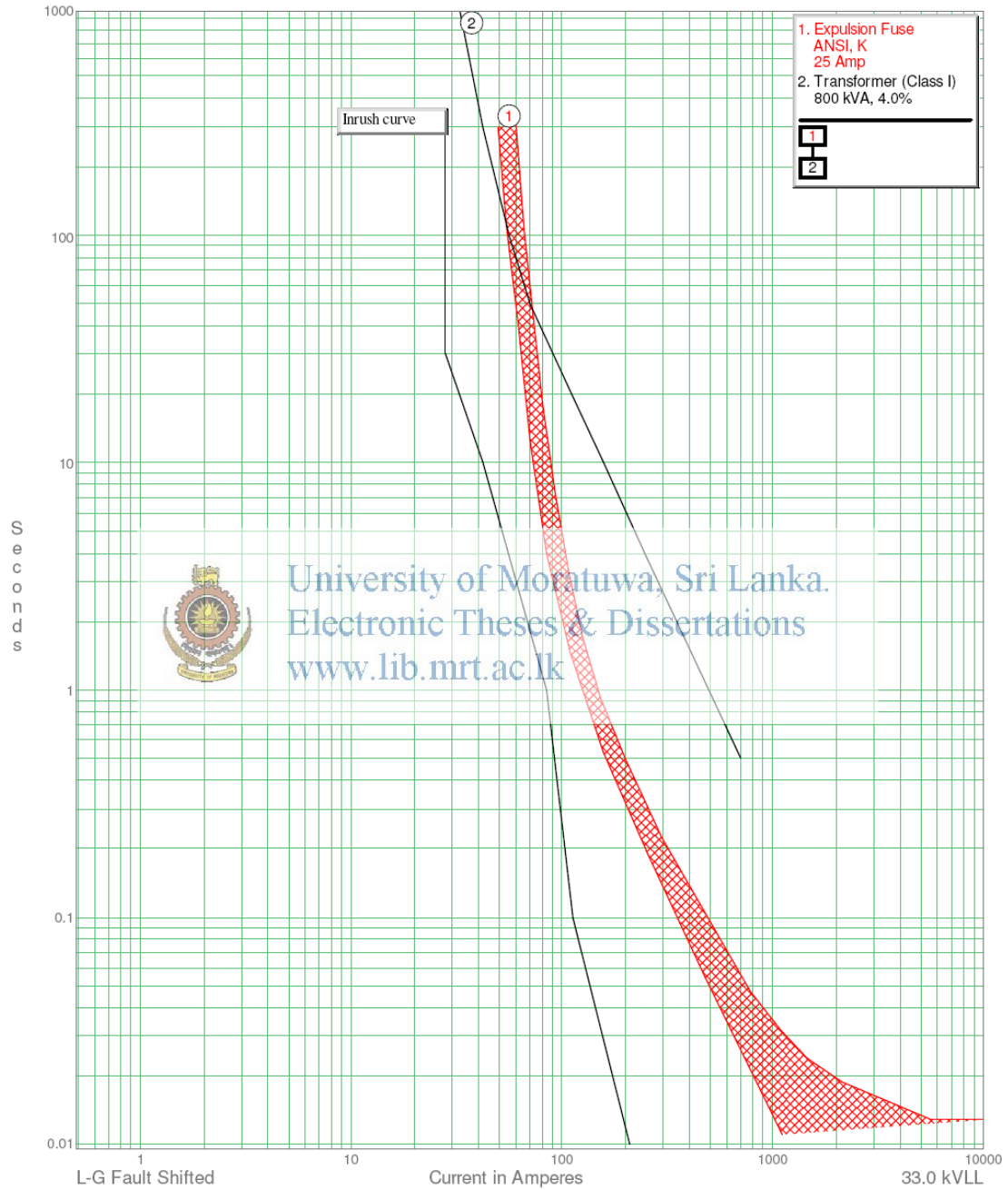
3. TCC for 400kVA 33/0.4kV transformer with 12A fuse



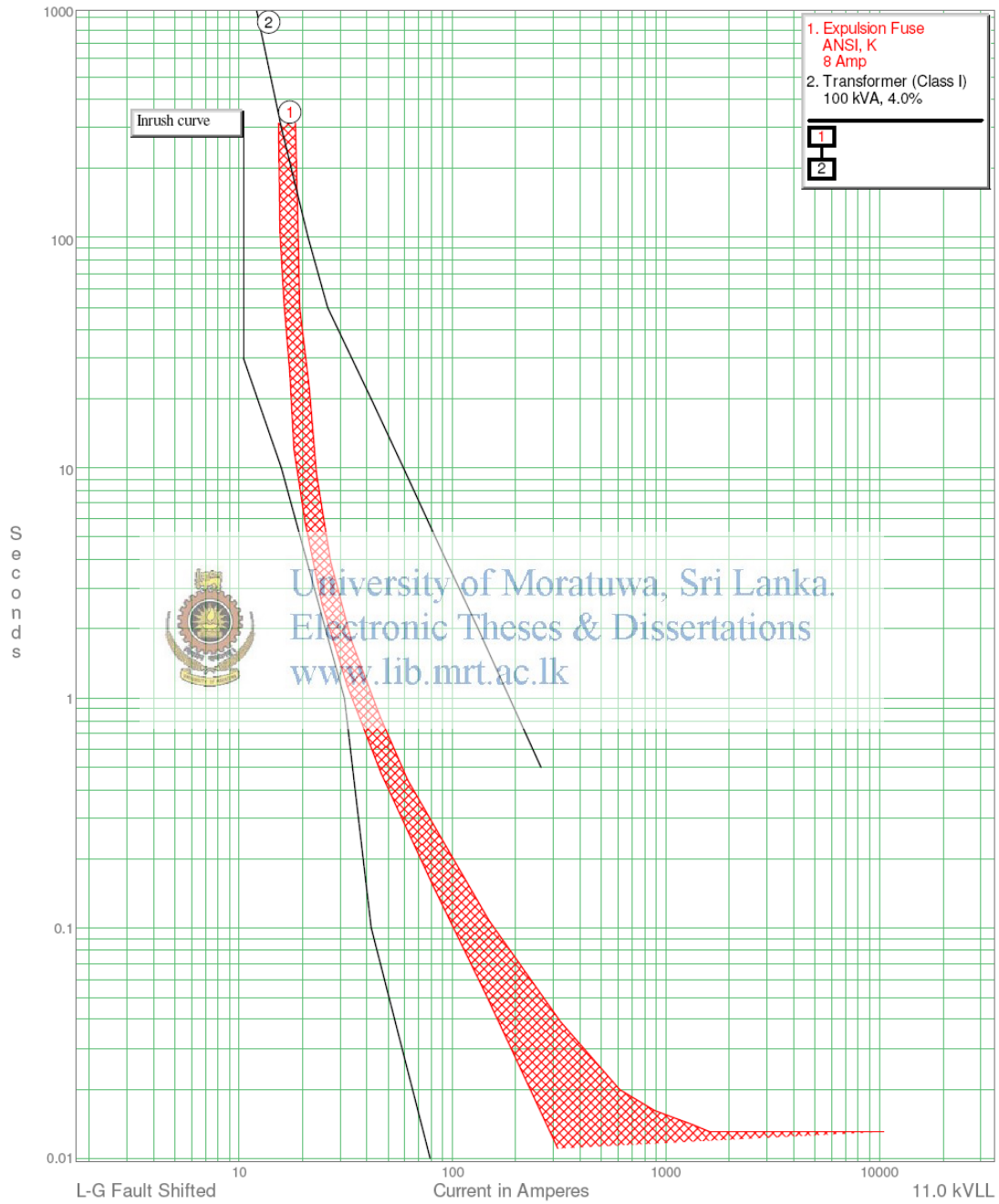
4. TCC for 630kVA 33/0.4kV transformer with 20A fuse



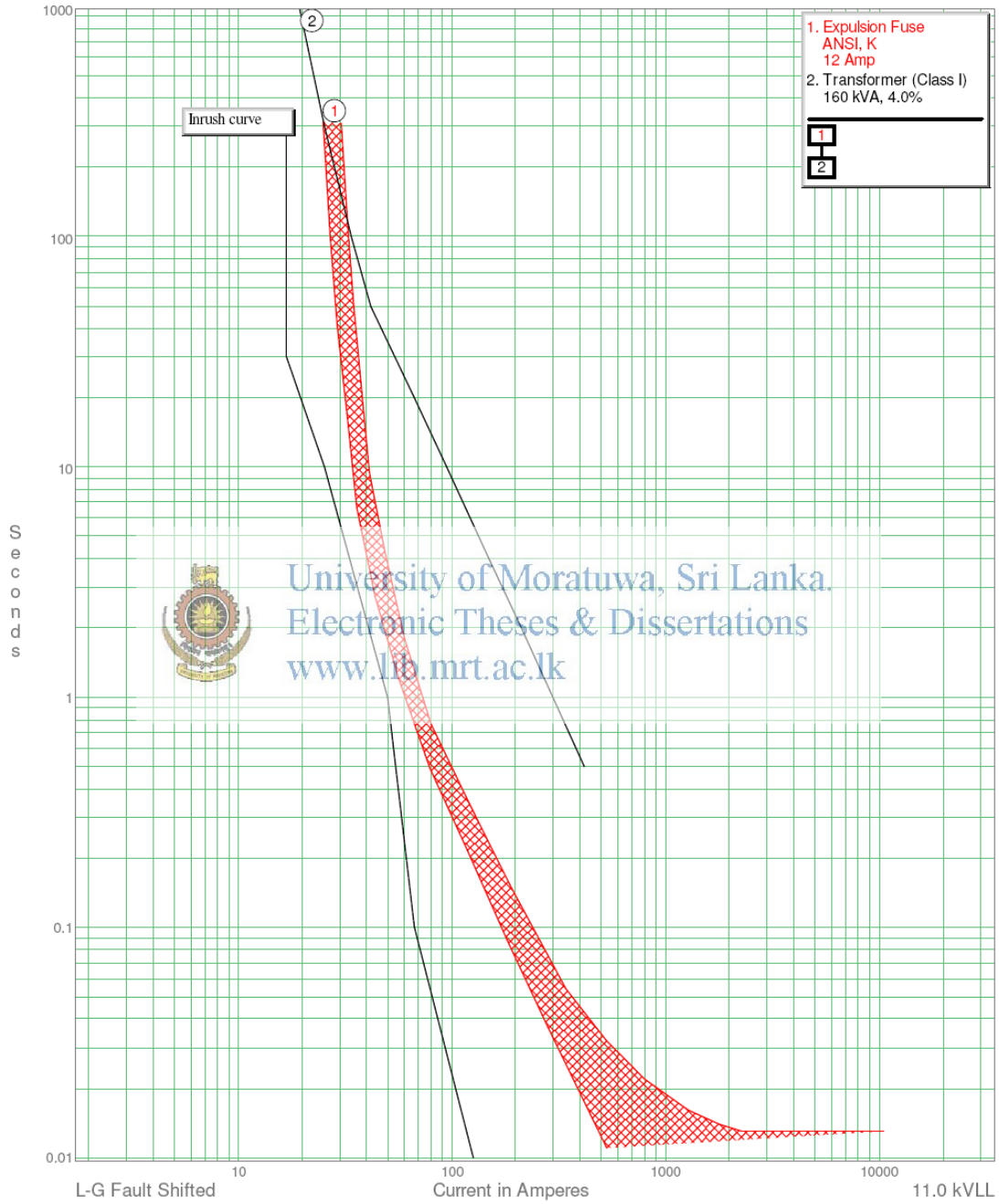
5. TCC for 800kVA 33/0.4kV transformer with 25A fuse



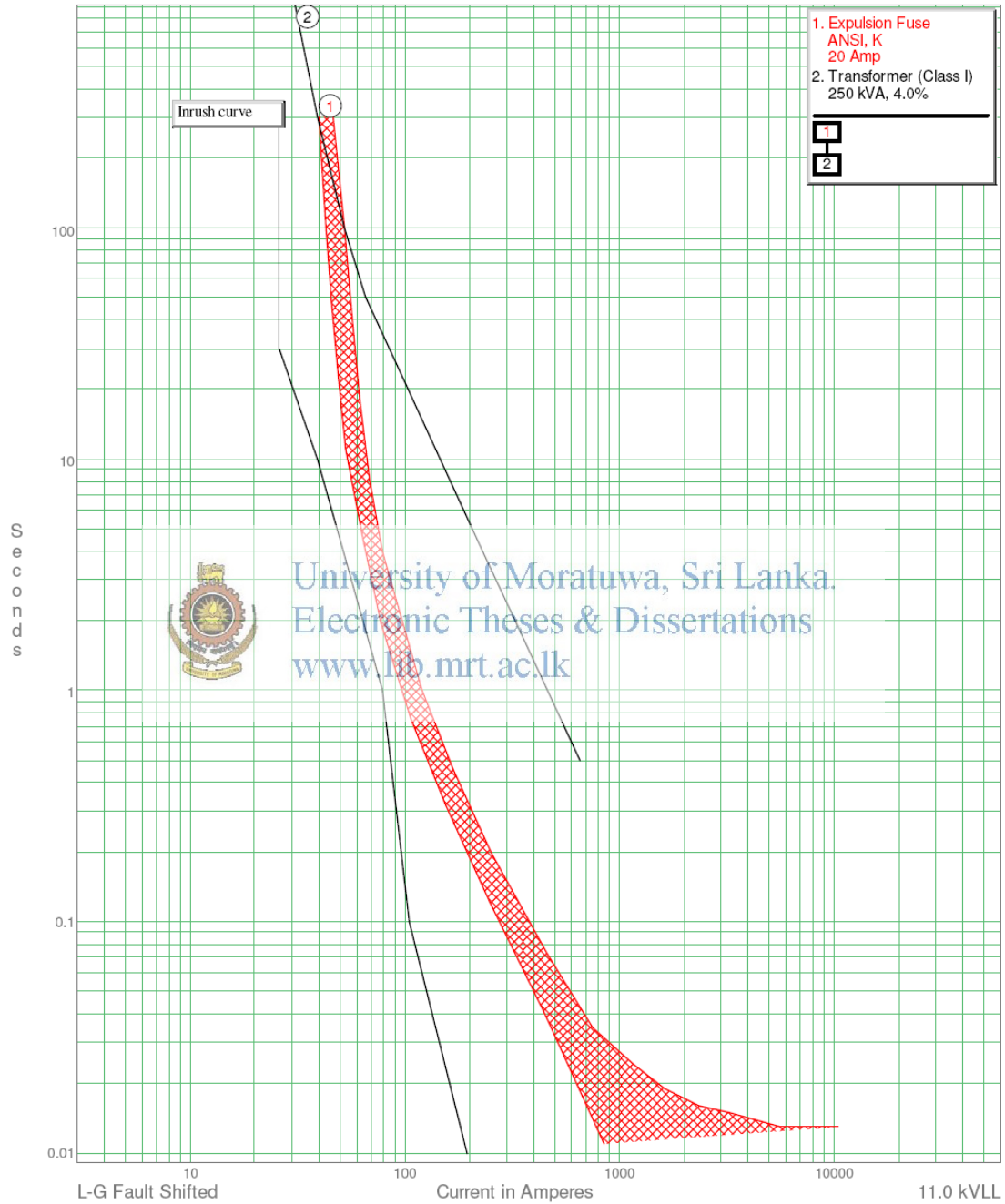
6. TCC for 100kVA 11/0.4kV transformer with 8A fuse



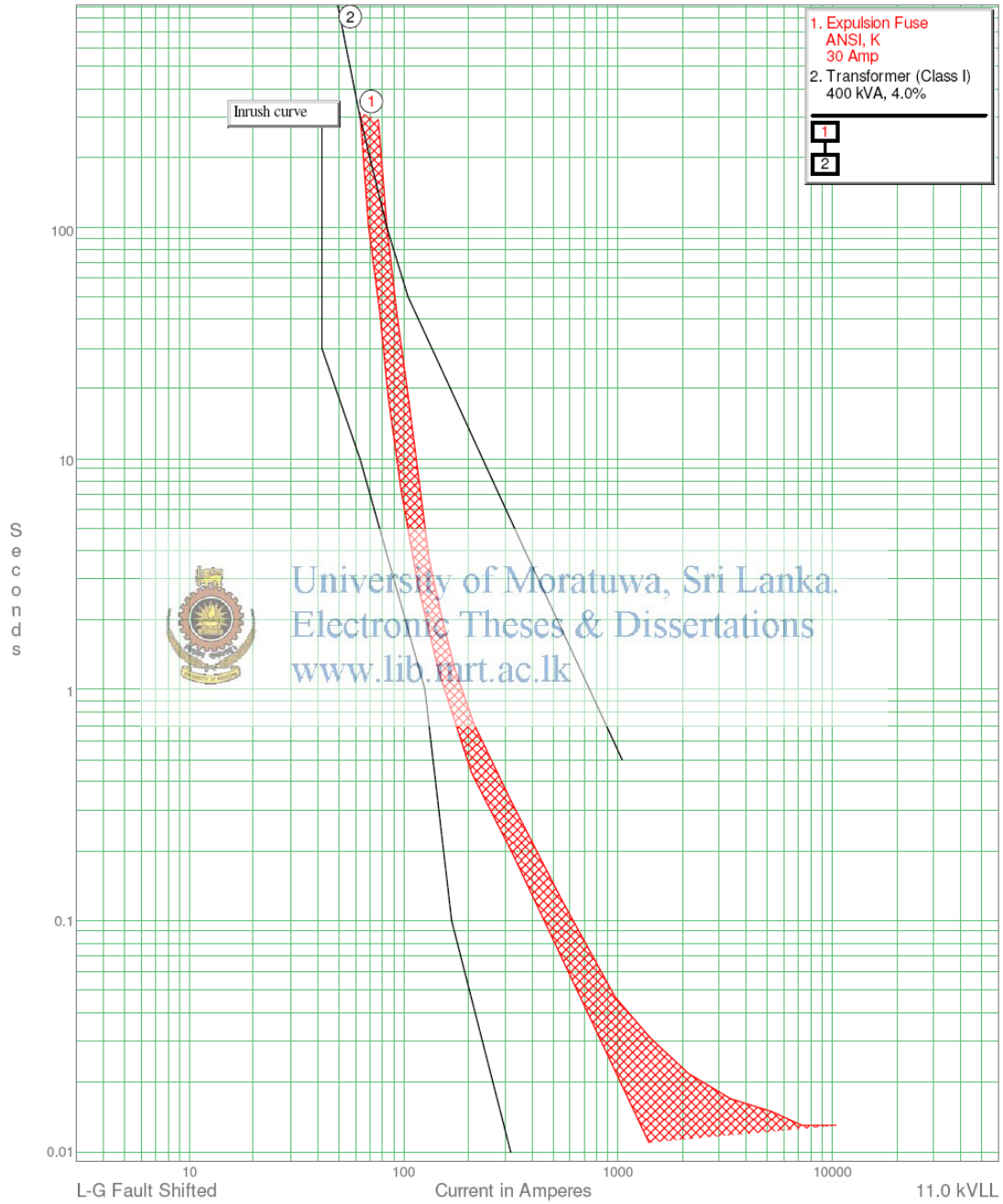
7. TCC for 160kVA 11/0.4kV transformer with 12A fuse



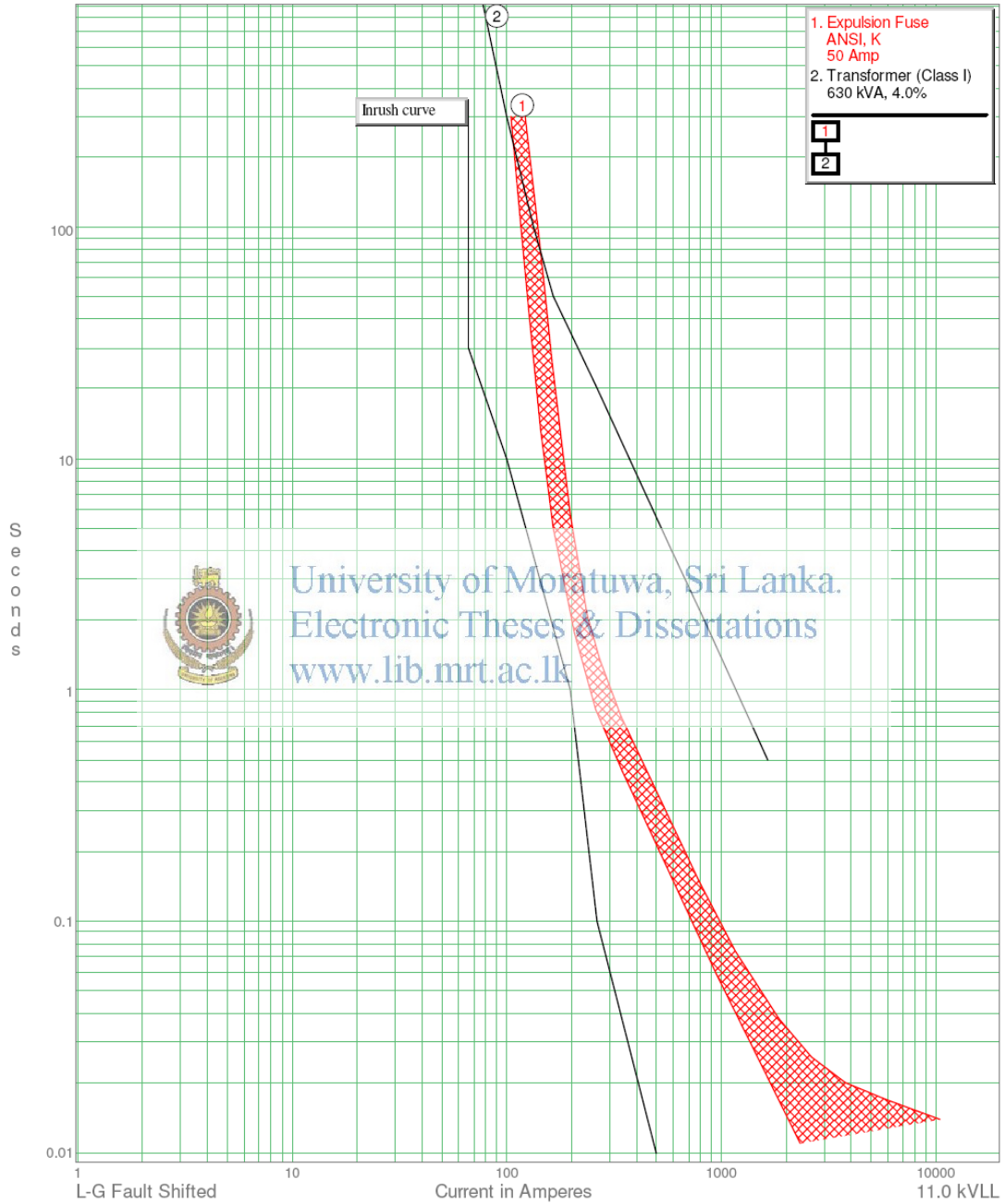
8. TCC for 250kVA 11/0.4kV transformer with 20A fuse



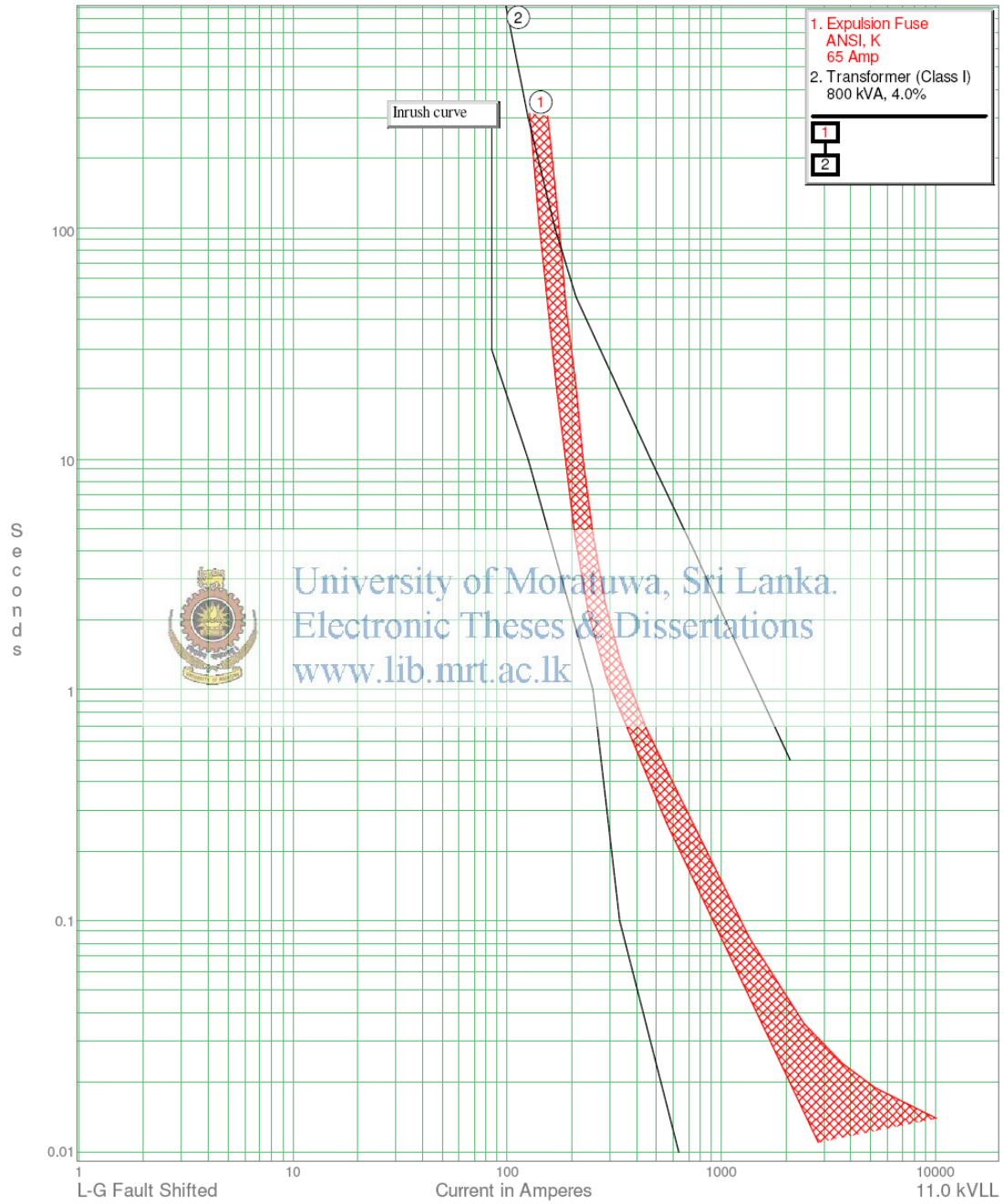
9. TCC for 400kVA 11/0.4kV transformer with 30A fuse



10. TCC for 630kVA 11/0.4kV transformer with 50A fuse

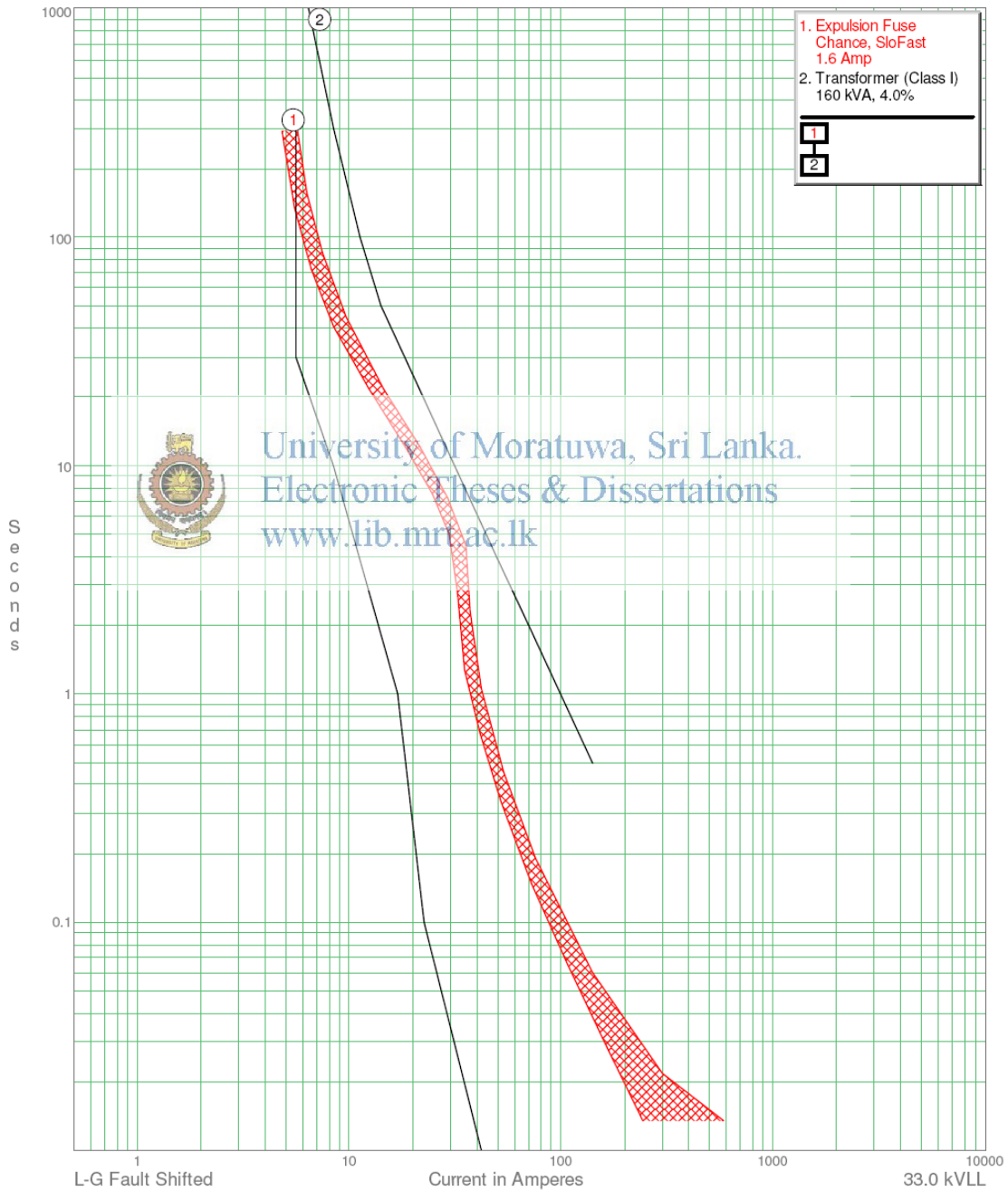


11. TCC for 800kVA 11/0.4kV transformer with 65A fuse

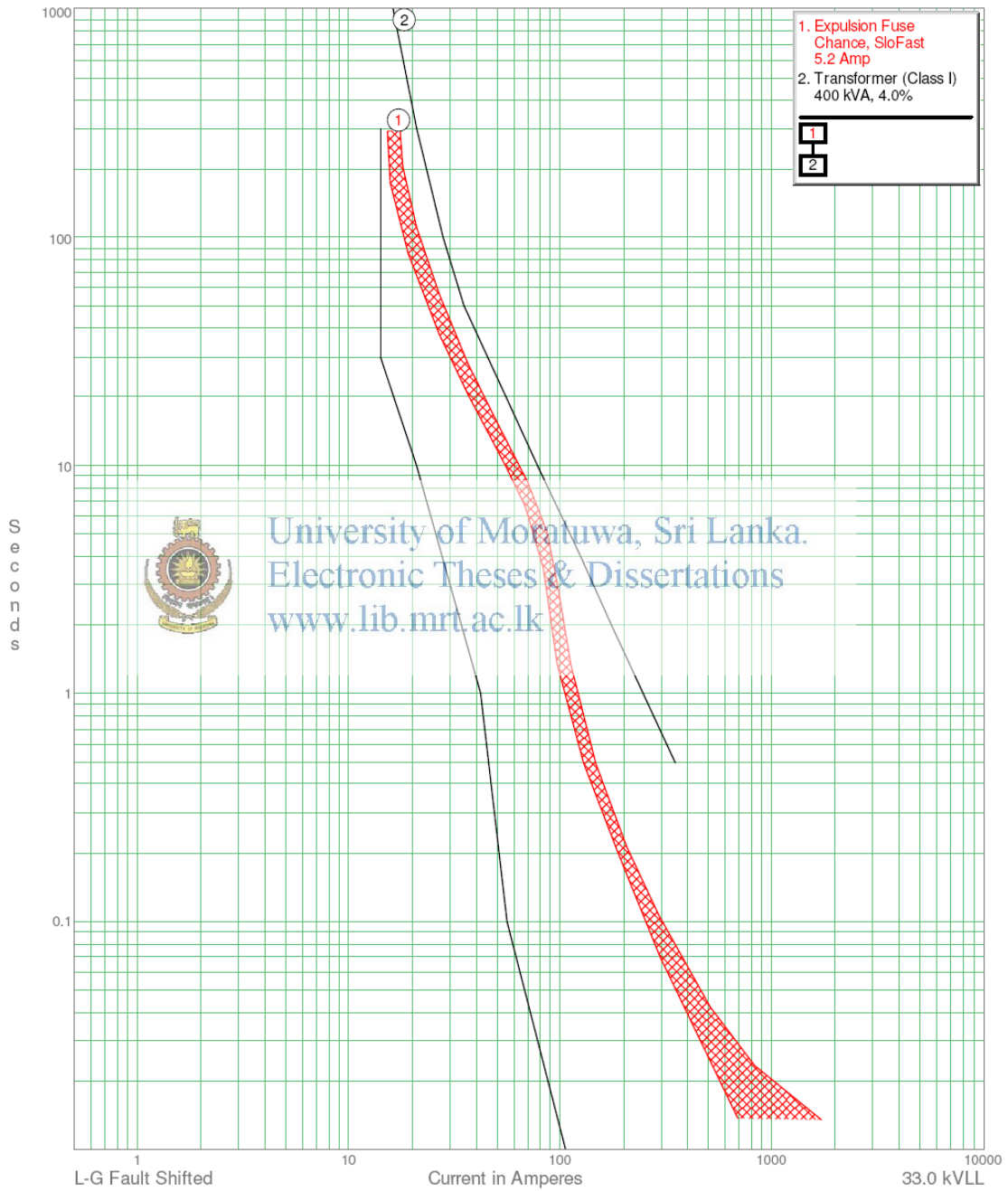


SloFast Fuse Selection

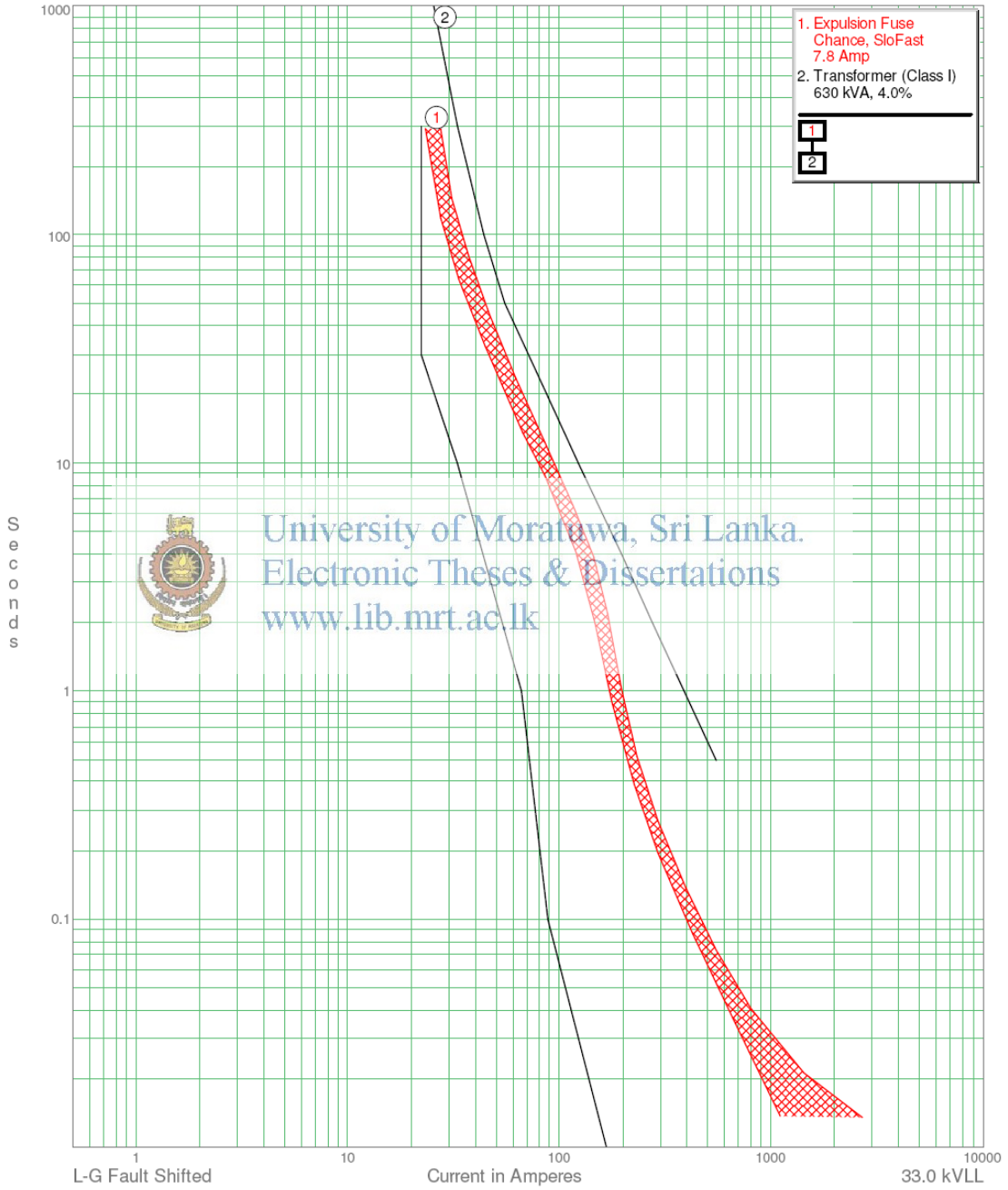
1. TCC curve for 160kVA 33/0.4kV transformer with 1.6A rated SloFast Fuse



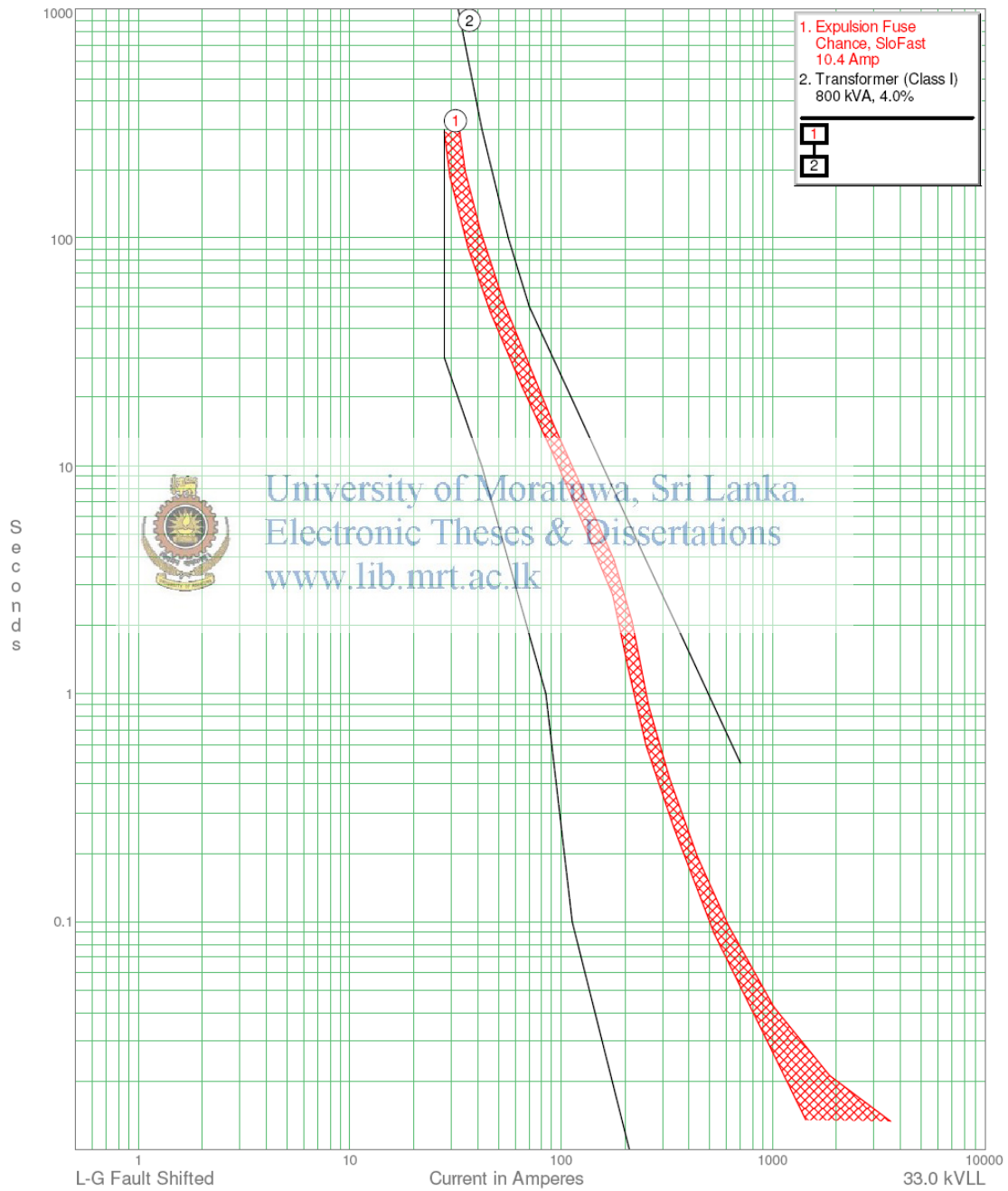
2. TCC curve for 400kVA 33/0.4kV transformer with 5.2A rated SloFast Fuse



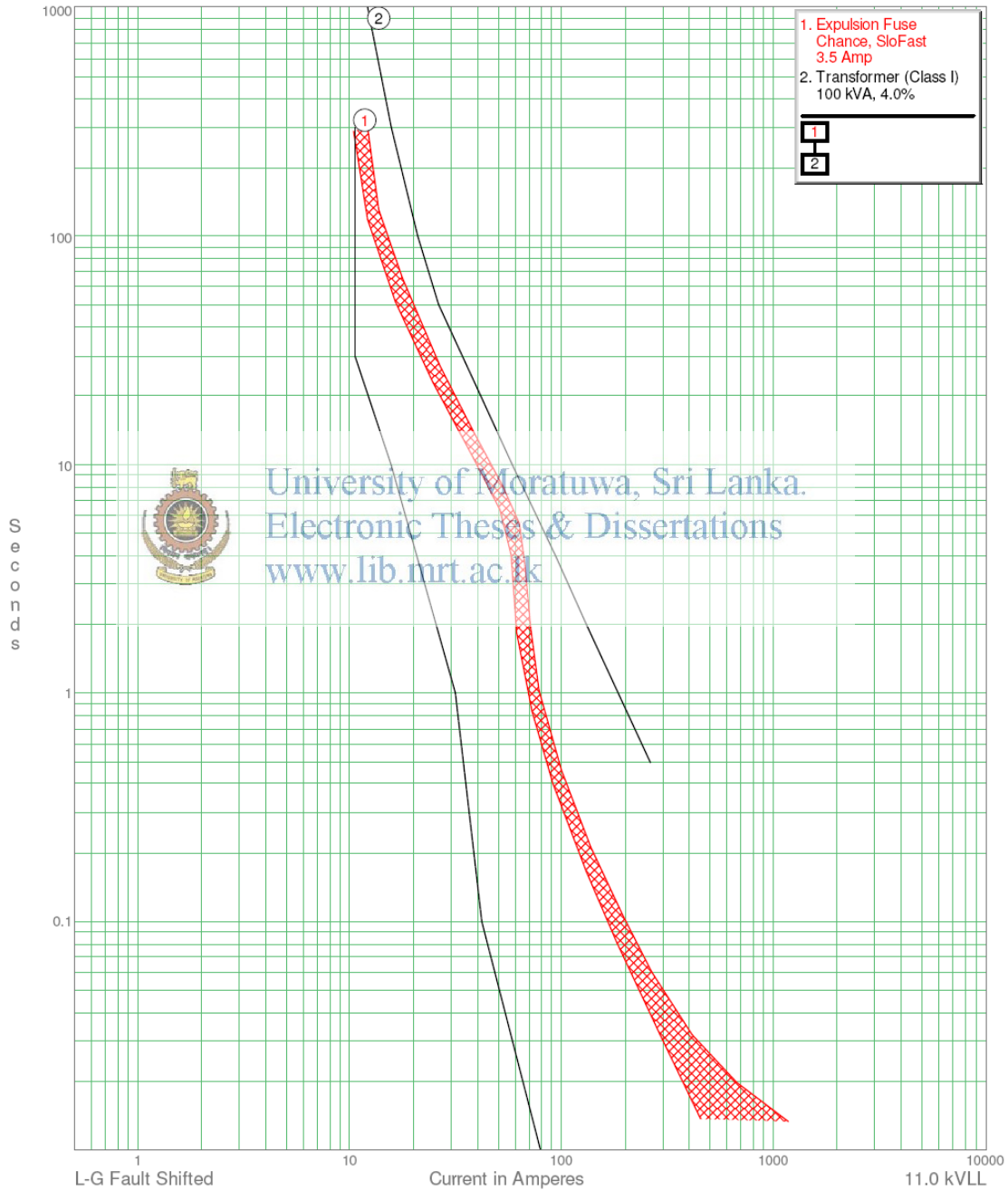
3. TCC curve for 630kVA 33/0.4kV transformer with 7.8A rated SloFast Fuse



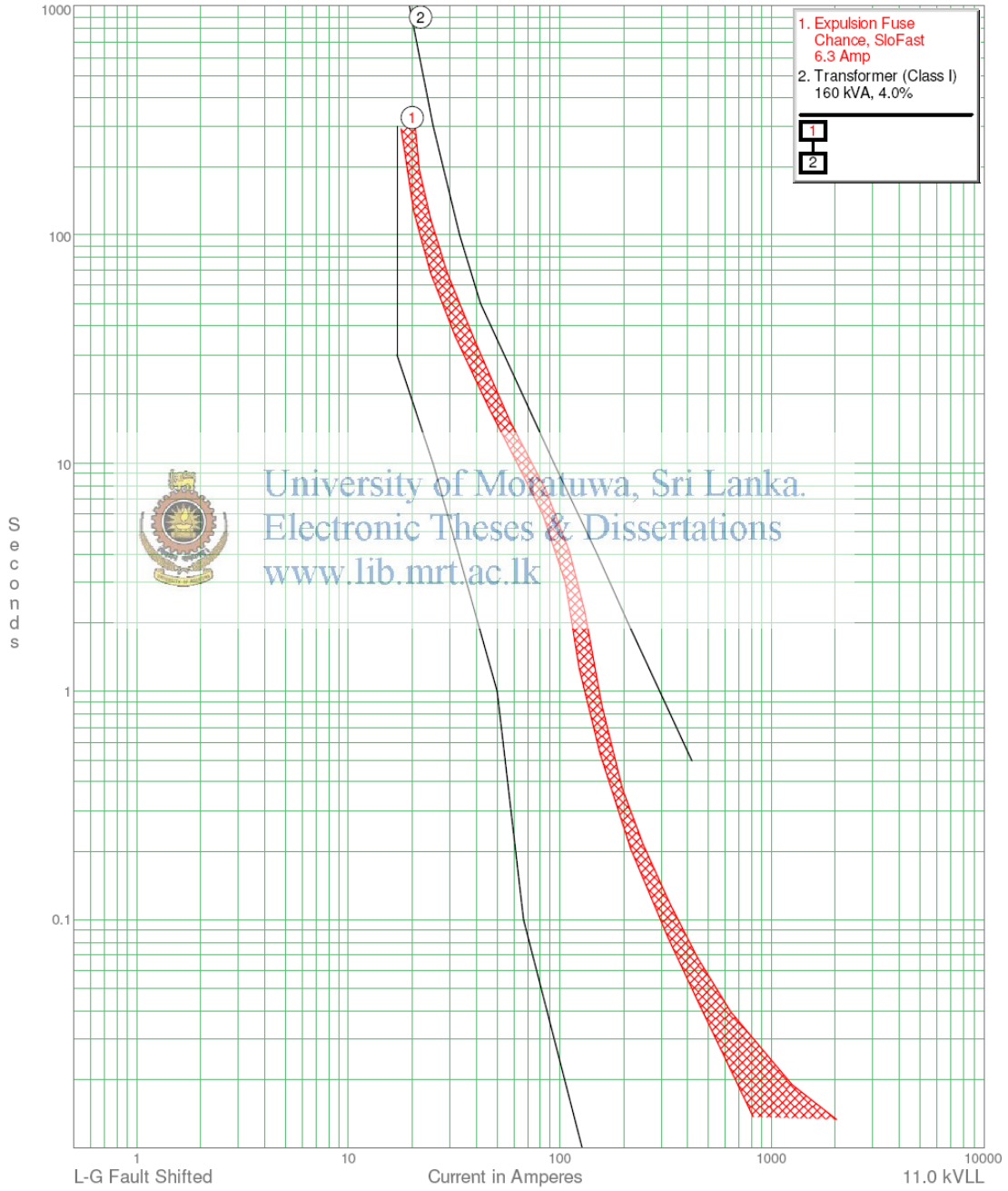
4. TCC curve for 800kVA 33/0.4kV transformer with 10.4A rated SloFast Fuse



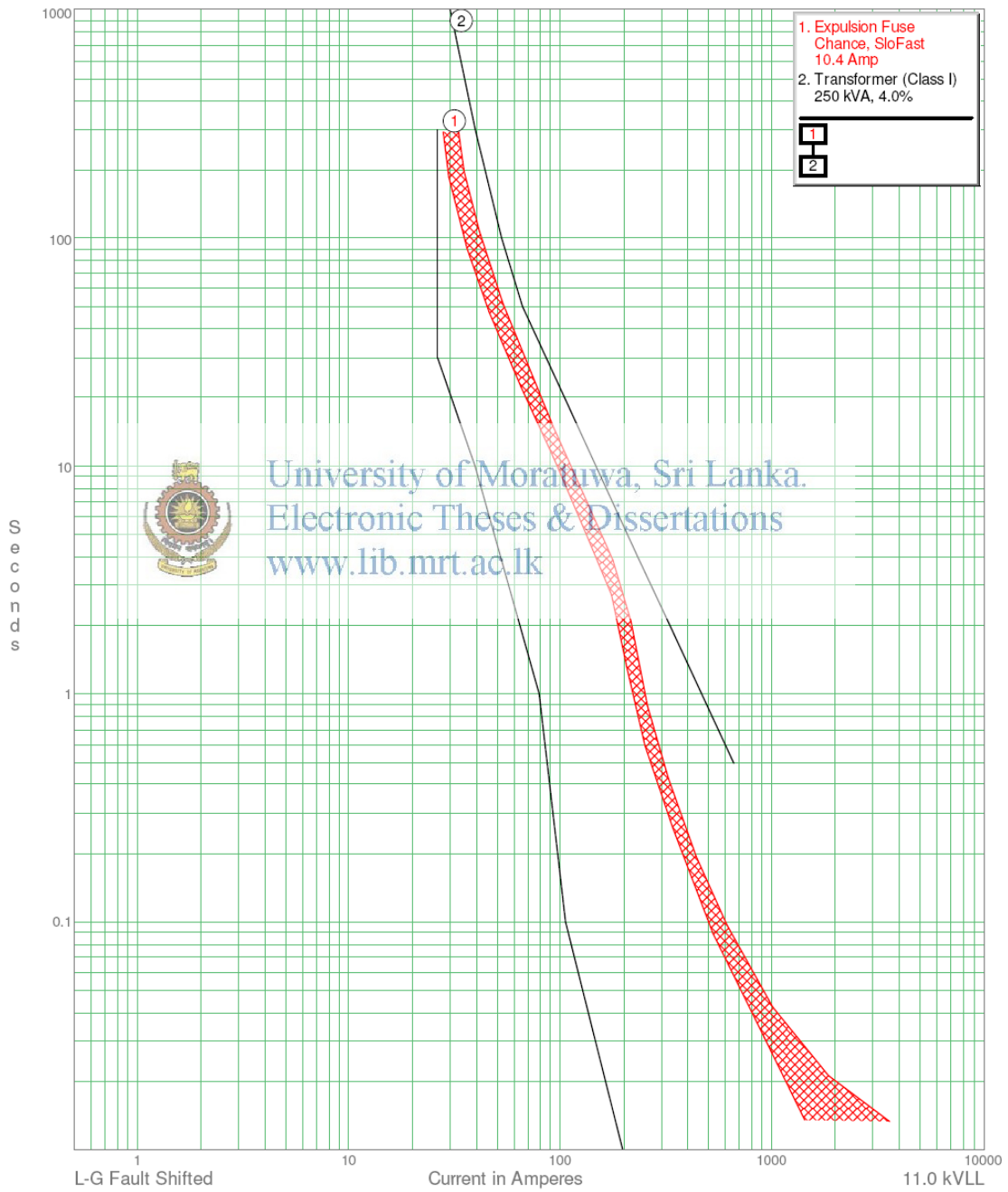
5. TCC curve for 100kVA 11/0.4kV transformer with 3.5A rated SloFast Fuse



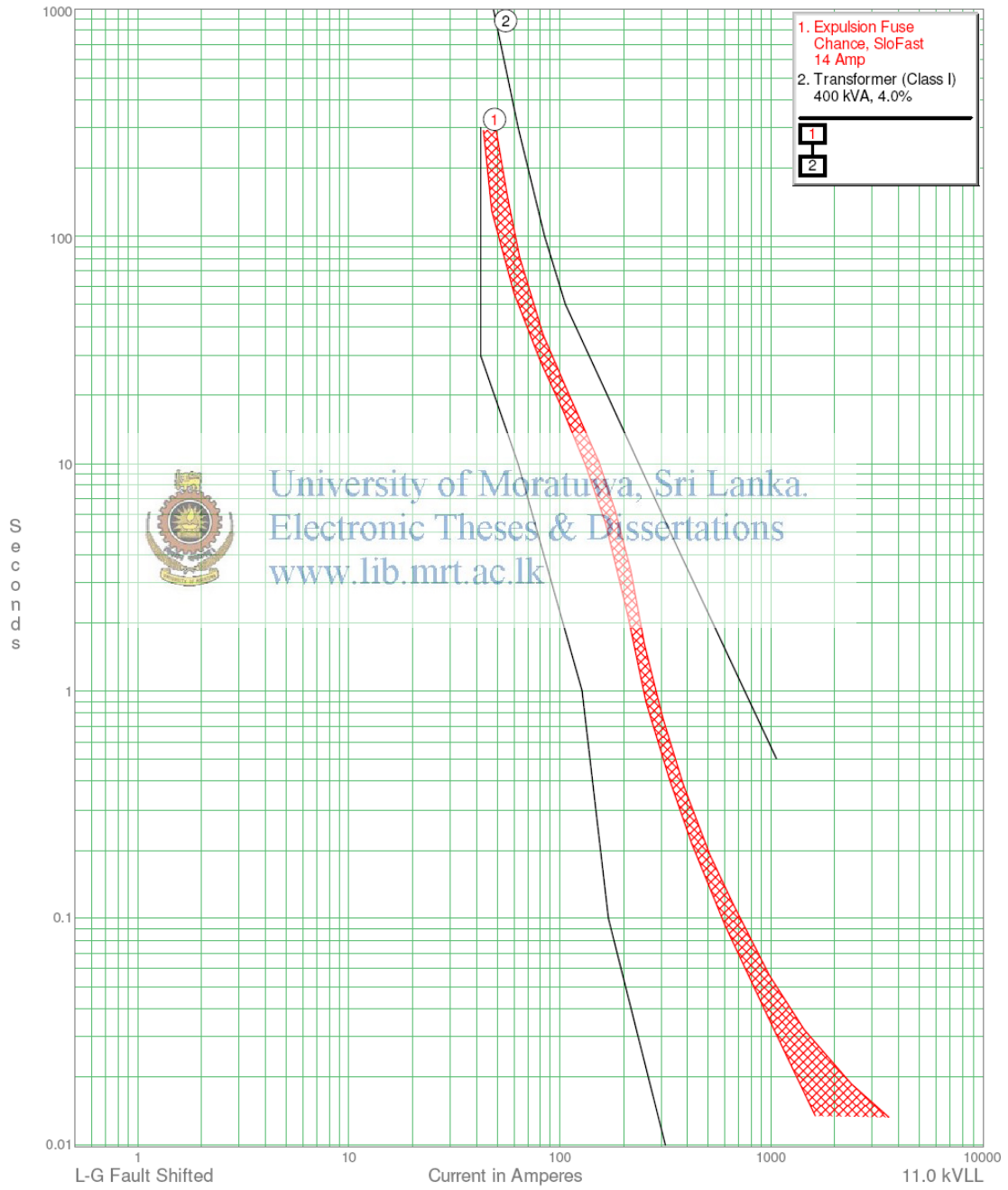
6. TCC curve for 160kVA 11/0.4kV transformer with 6.3A rated SloFast Fuse



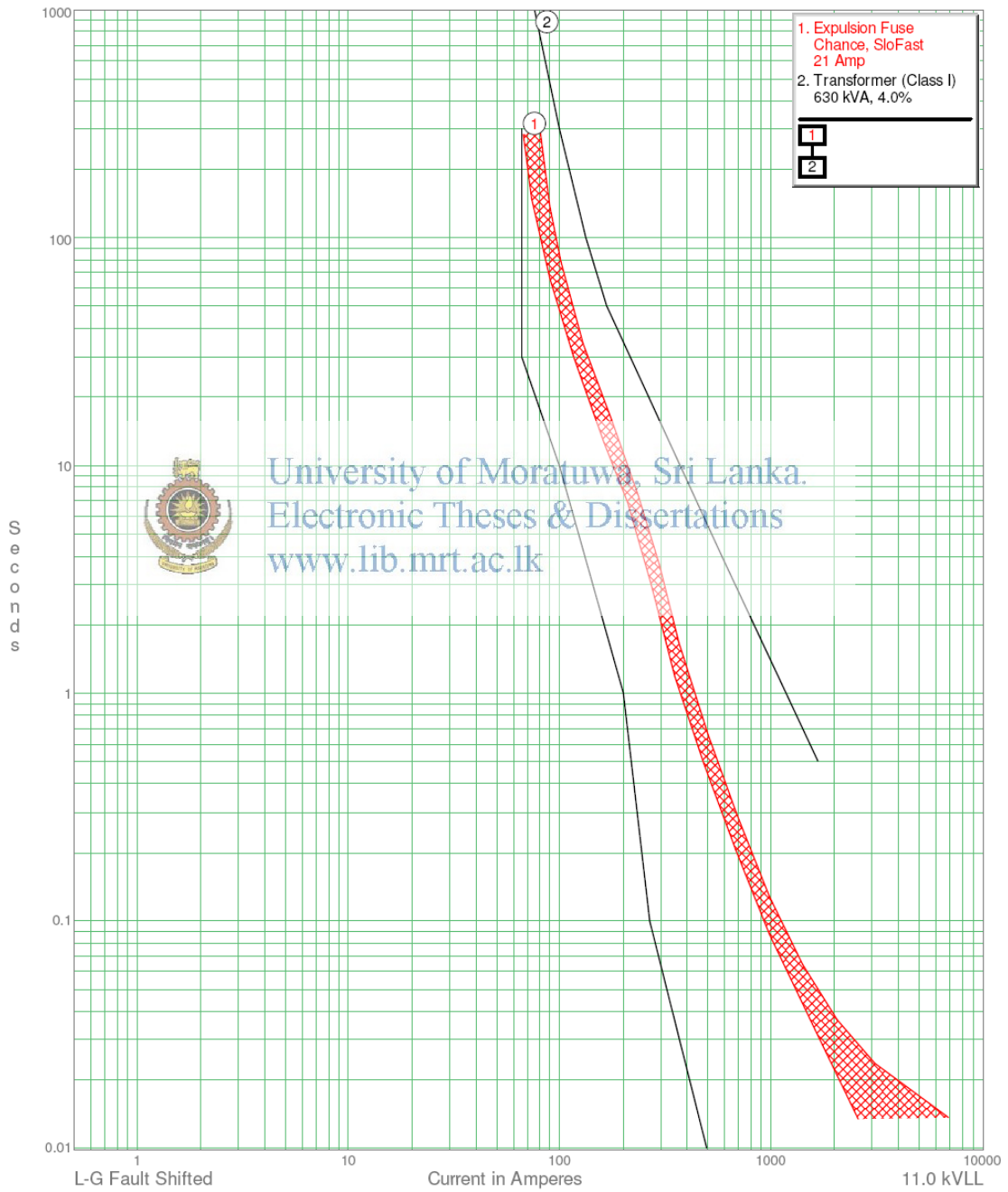
7. TCC curve for 250kVA 11/0.4kV transformer with 10.4A rated SloFast Fuse



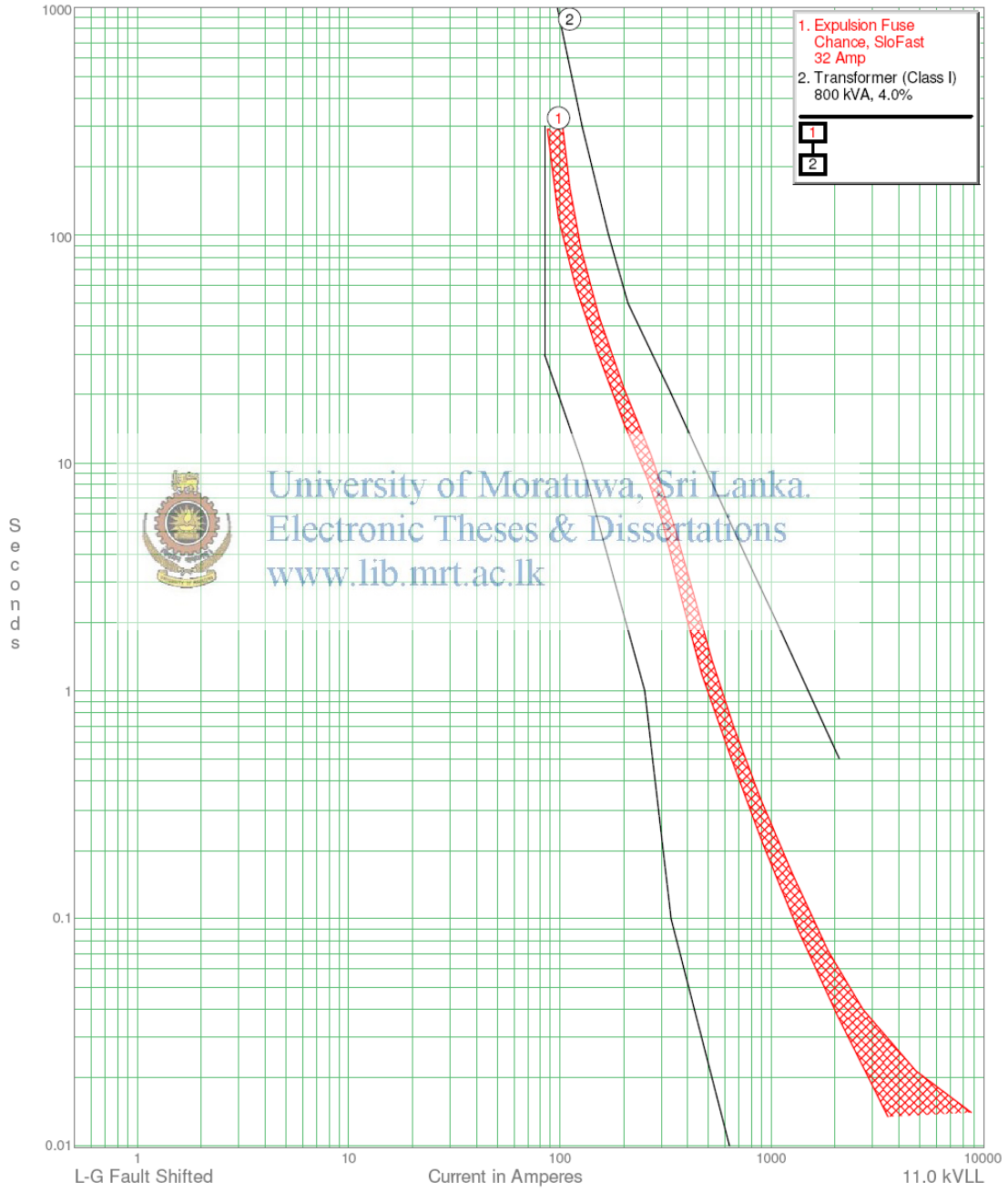
8. TCC curve for 400kVA 11/0.4kV transformer with 14.0A rated SloFast Fuse



9. TCC curve for 630kVA 11/0.4kV transformer with 21.0A rated SloFast Fuse



10. TCC curve for 800kVA 11/0.4kV transformer with 32.0A rated SloFast Fuse



160kVA Substation Peak Load Reading in Ambalangoda Area

Annex 4

No	Substation Name	Sin No	Capacity	KVA Load	Load %	Feeder 1				Feeder 2				Feeder 3				Feeder 4				Total				% of per phase loading
						R	Y	B	N	R	Y	B	N	R	Y	B	N	R	Y	B	N	R	Y	B	N	
1	Thilakapura New	AS012	160	92.23	58%	98	68	70	40	10	50	32	36	34	15	24	22					142	133	126	98	<80%
2	Dalukanda Tsunami	AS025	160	33.81	21%	10	22	20	10	25	20	15	10	10	10	15	10					45	52	50	30	<80%
3	Vocational Tra	AS027	160	48.3	30%	25	20	15	5	15	25	45	8	25	20	20	5					65	65	80	18	<80%
4	Thalgasgoda CTB	AS030	160	193.2	121%	90	110	100	50	110	100	100	10	20	20	20	40	100	30	40	40	320	260	260	140	>100%
5	Unagaswela	AS080	160	116.15	73%	30	60	60	40	30	50	60	40	60	65	90	20					120	175	210	100	80% -100%
6	Madakumbura	AS090	160	144.9	91%	47	85	85	37	90	100	105	25	75	8	35	52					212	193	225	114	80% -100%
7	Magala North	AS112	160	143.29	90%	120	110	98	35	75	80	60	20	50		30	50					245	190	188	105	>100%
8	LenagalaPalatha	AS114	160	86.48	54%	160	75	80	90	5	38	18	32									165	113	98	122	<80%
9	Borakanda	AS150	160	170.43	107%	45	50	50	15	45	50	95	60	140	100	140	40	9	12	5	12	239	212	290	127	>100%
10	MahaEdanda	AS160	160	112.7	70%	50	70	70	40	70	90	140	45									120	160	210	85	80% -100%
11	Amarakeerthigama	AS167	160	46.92	29%	10	10	15	5	25	22	20	5	30	32	40	10					65	64	75	20	<80%
12	Patteraketiya	AS180	160	120.75	75%	65	65	55	25	50	60	55	25	60	65	50	22					175	190	160	72	80% -100%
13	Kirimetiya	AS190	160	108.56	68%	60	65	120	50	95	25	65	35	42	0	0	38					197	90	185	123	80% -100%
14	Dorala	AS200	160	181.01	113%	75	80	50	20	50	63	55	22	78	60	62	29	48	55	46	17	260	306	221	121	>100%
15	Kahatapitiya TF	AS210	160	183.31	115%	66	39	54	27	72	129	61	52	72	120	60	48	40	47	37	7	250	335	212	134	>100%
16	Sunil Garment	AS220	160	25.3	16%	40	35	35	5													40	35	35	5	<80%
17	Illukpitiya	AS260	160	249.55	156%	150	145	150	30	100	100	150	30	100	80	110	30					350	325	410	90	>100%
18	Meetiyyagoda Town	AS290	160	174.8	109%	100	200	100	75	110	100	150	75									210	300	250	150	>100%
19	Galduwa	AS300	160	88.75	55%	68	97	68	31	8	15	22	11	31	30	52	25					102	142	142	67	<80%
20	Galagoda Tsunami-1	AS302	160	40.25	25%	10	10	8	5	22	25	20	15	20	30	30	10					52	65	58	30	<80%
21	Galagoda Tsunami-11	AS305	160	34.04	21%	20	25	25	5	40	12	8	4	15	18	15	4					45	55	48	13	<80%
22	Galagoda Tsunami-111	AS313	160	20.7	13%	20	18	20	5	12	10	10										32	28	30	5	<80%
23	Galduwa New Colony	AS315	160	20.7	13%	20	20	15	6	10	10	15	5									30	30	30	11	<80%
24	Pathegama	AS340	160	181.7	114%	100	125	100	40	70	25	70	30	130	50	120	50					300	200	290	120	>100%
25	Ambana-Sinha Kaway	AE 020	160	143.98	90%	66	80	81	28	74	90	66	18	58	53	58	6					198	223	205	52	80% -100%
26	Kahaduwa	AE30	160	126.04	79%	48	41	35	13	19	28	35	17	52	75	58	18	45	72	40	25	164	216	168	73	80% -100%
27	Andurathwila	AE40	160	64.86	41%	54	26	16	35	26	64	96	57									80	90	112	92	<80%
28	Miriswatta T/F	AE50	160	68.31	43%	5	0	8	7	90	87	107	30									95	87	115	37	<80%
29	Eramulla T/F	AE60	160	100.74	63%	44	17	44	29	96	44	43	54	40	60	50	17					180	121	137	100	<80%
30	Gonathippala	AE65	160	27.6	17%	49	34	37	16													49	34	37	16	<80%
31	Polgahawila Nugetota	AE90	160	54.51	34%	9	14	19	5	16	18	2	1	29	51	39	0	6	7	27	21	60	90	87	27	<80%
32	Agaliya Mulkada	AE100	160	76.36	48%	40	16	3	36	70	45	41	29	17	50	50	40					127	111	94	105	<80%
33	Ella Ihalagoda	AE120	160	68.77	43%	59	53	91	34	7	43	13	30	15	6	12	14					81	102	116	78	<80%
34	Ellawatta T/F	AE140	160	104.88	66%	27	39	46	13	11	1	28	16	76	68	34	39	56	36	34	54	188	162	168	123	80% -100%
35	Kurundugaha Gantry Sub	AE180	160	28.75	18%	10	9	3	7	16	41	46	25									26	50	49	32	<80%
36	Igalkanda	AE190	160	38.64	24%	0	3	18	18	0	0	0	0	91	37	11	59	1	4	3	4	92	44	32	81	<80%
37	Kurundugahahethekma	AE200	160	70.38	44%	50	74	83	34	56	18	25	52									106	92	108	86	<80%
38	Saranankara	AE240	160	115.92	72%	52	89	91	20	53	25	34	16	41	21	5	26	40	49	4	22	186	184	134	84	80% -100%
39	Thilaka T/F Pituwala	AE260	160	80.362	50%	92	46	48	40	30	40	21	23	16	33	23	15	0.3	0	0.1	0.3	138	119	92	78	<80%
40	Pituwala	AE270	160	126.73	79%	95	92	85	15	18	43	11	28	74	73	60	15					187	208	156	58	80% -100%

41	Elpitiya T'Com	AE280	160	101.43	63%	16	30	54	4	63	46	40	23	45	60	32	23	20	18	17	5	144	154	143	55	<80%
42	Vocational Training	AE310	160	34.96	22%	78	29	40	35	3	1	1	1									81	30	41	36	<80%
43	Rajamaha Vihara Mawatha	AE320	160	43.93	27%	54	34	17	21	40	17	29	19									94	51	46	40	<80%
44	Ketapola RE	AE330	160	54.97	34%	53	73	28	31	3	5	1	3	59	13	4	54					115	91	33	88	<80%
45	Police Training	AE340	160	46	29%	43	2	28	35	21	18	45	23	16	12	15	6					80	32	88	64	<80%
46	Omaththa	AE380	160	53.36	33%	27	29	20	17	14	26	32	18	21	12	10	14	5	36		32	67	103	62	81	<80%
47	Opatha	AE400	160	30.13	19%	21	22	12	5	30	14	29	16	1	1	1	0					52	37	42	21	<80%
48	Maitheegama	AE420	160	225.4	141%	95	112	131	7	89	96	119	12	112	119	107	8					296	327	357	27	>100%
49	Mukalanhena	AE426	160	35.19	22%	2	58	5	50	41	13	34	30									43	71	39	80	<80%
50	Batuwanhena(Kumarasingh)	AE428	160	81.19	51%	63	50	97	40	2	1	1	2	20	61	58	53					85	112	156	95	<80%
51	Nawadagala Jambugaha	AE430	160	83.03	52%	39	20	31	20	5	88	46	68	46	40	46	23					90	148	123	111	<80%
52	Thilini Metal Crusher	AE432	160	1.15	1%	2	1	2	1													2	1	2	1	<80%
53	Atakohota	AE440	160	77.74	49%	6	24	31	24	3	62	56	37	67	59	30	37					76	145	117	98	<80%
54	Hipanwatta	AE447	160	48.3	30%	4	3	9	6	27	19	29	12	19	28	27	12	8	21	16	9	70	94	96	52	<80%
55	6th Mill post	AE 449	160	68.54	43%	10	43	35	30	9	12	25	10	25	71	68	40					44	126	128	80	<80%
56	11 Mill post	AE450	160	89.01	56%	19	35	2	28	45	23	70	37	35	44	19	13	17	24	54	32	116	126	145	110	<80%
57	Talagaspe	AE490	160	72.68	45%	49	37	19	18	27	27	22	5	21	18	27	35	24	26	19	9	121	108	87	67	<80%
58	Kellapatha T/F	AE510	160	41.86	26%	38	43	31	13	31	21	18	21									69	64	49	34	<80%
59	Amaragama	AE520	160	109.71	69%	45	45	45	1	10	11	11	4	140	100	70	60					195	156	126	65	80% -100%
60	Amugoda	AE530	160	109.25	68%	37	49	65	34	26	34	52	52	78	98	29	56	1	9	2	9	142	185	148	151	80% -100%
61	Pitigala P/ St.Totupolr Rd	AE560	160	31.05	19%	15	21	39	17	12	12	18	5	3		4	5	3	7	8		35	36	64	34	<80%
62	Hattaka	AE610	160	111.32	70%	26	26	29	10	46	48	90	32	60	81	43	37	14	13	8	7	146	168	170	86	<80%
63	Uhanovita	AE620	160	38.64	24%	60	26	42	19	1	23	16	22									61	49	58	41	<80%
64	Pitigala North	AE630	160	75.44	47%	24	55	58	29	79	65	44	26	1	1	3	1					104	119	105	56	<80%
65	Sohana J.	AI 090	160	140.798	88%	110	90	110	25	12	26	100	28	15	25	30	20	22	45	38	20	159	186	278	93	>100%
66	Kirimetiya	AI 170	160	87.688	55%	18	45	30		30	35	40		30	20	60		25	25	30		103	125	160	0	<80%
67	Polathupalatha	AI 190	160	132.075	83%	28	11	0	10	2	6	12	8	105	120	110		38	70	85		173	207	207	18	80% -100%
68	Pathirajagama	AI 200	160	151.42	95%	70	30	70		80	100	130		70	20	100						220	150	300	0	>100%
69	Bridge Bentota	AI 225	160	27.6	17%	10	28	20	16	10	30	22	18									20	58	42	34	<80%
70	Galwehera	AI 290	160	157.776	99%	10	12	41	22	59	95	98	38	125	135	117	12					194	242	256	72	>100%
71	Piyagama	AI 320	160	105.564	66%	98	81	47	39	27	28	43	18	43	45	51	8					168	154	141	65	<80%
72	Wellangoda	AI 353	160	81.42	51%	75	63	53	26	53	50	60	8									128	113	113	34	<80%
73	Cinesco Village	AI 368	160	28.06	18%	28	31	19	12	11	18	5	5	5	3	2	0					44	52	26	17	<80%
74	Arora Village	AI 369	160	28.75	18%	15	36	21	18	12	36	5	19									27	72	26	37	<80%
75	Kosgoda Telecom	AI 400	160	58.824	37%	45	60	40	26	26	35	26	9	15	8	3	7					86	103	69	42	<80%
76	AIDA	AI 430	160	90.06	56%	130	125	140	15													130	125	140	15	<80%
77	Obadawatta	AI 440	160	147.288	92%	16	90	70	70	90	30	120	80	50	110	70	50					156	230	260	200	>100%
78	Sumanagiri	AI 555	160	65.09	41%	41	29	28	11	25	28	32	8	45	39	16	23					111	96	76	42	<80%
79	Etawalawatta	AI 560	160	71.051	44%	42	40	38	2	40	2	7	38	35	52	48	28	0	0	9		117	94	102	68	<80%
80	Gonagalapura	AI 590	160	111.264	70%	10	5	12	8	10	15	36	27	125	70	105	60	20	35	45	22	165	125	198	117	80% -100%
81	Swasthi mill	AI 610	160	24.97	16%	25	40	45	20													25	40	45	20	<80%
82	Galapatha	AI 650	160	80.585	50%	50	60	50	10	55	70	70	30									105	130	120	40	<80%
83	Adagantota	AI670	160	103.512	65%	85	132	73		10	16	40		15	26	57						110	174	170	0	<80%

84	Dedduwa Junction	AI675	160	74.75	47%	60	30	50	40	35	40	40	20	5	30	35	30					100	100	125	90	<80%
85	Haburugala	AI 680	160	136.427	85%	60	70	70	15	120	100	90	28	30	28	28	0	2	1	2	0	212	199	190	43	80% -100%
86	Thuduwa	AI 700	160	142.783	89%	46	100	100	40	65	130	140	75	25	13	10	12					136	243	250	127	>100%
87	Horawala J.	AI 710	160	120.31	75%	35	15	40	30	95	100	110	20	5	25	30	18	15	20	40	20	150	160	220	88	80% -100%
88	Green Garden	AI 725	160	36.57	23%	8	10	6	4	39	26	35	12	12	15	8	10					59	51	49	26	<80%
89	Pilekumbura	AI 730	160	106.917	67%	20	35	52	18	35	55	65	26	40	65	55	20	3	20	26	18	98	175	198	82	80% -100%
90	Gallindawatta	AT010	160	41.4	26%	50	50	80	30	0	0	0	0	0				0				50	50	80	30	<80%
91	Gurugodella	AT030	160	59.11	37%	110	105	41	68	0	0	1	1									110	105	42	69	<80%
92	Horangalla	AT060	160	61.64	39%	56	50	42	17	39	41	40	13									95	91	82	30	<80%
93	Dodangahawatte Watteha	AT080	160	80.73	50%	83	56	77	20	31	59	45	30									114	115	122	50	<80%
94	Porawagama	AT100	160	136.39	85%	76	88	82	23	67	57	106	22	43	16	58	6					186	161	246	51	>100%
95	Marakanda	AT140	160	80.73	50%	78	81	76	26	38	38	40	3									116	119	116	29	<80%
96	Weihena	AT175	160	91.54	57%	56	27	35	24	80	88	112	33									136	115	147	57	<80%
97	Bambarawana	AT180	160	73.37	46%	18	50	49	31	60	60	82	85									78	110	131	116	<80%
98	Susantha T/F	AT190	160	67.85	42%	13	27	13	14	82	80	80	2									95	107	93	16	<80%
99	Godamuna T/F	AT220	160	54.05	34%	62	80	93	22													62	80	93	22	<80%
100	Perusingha T/F	AT260	160	65.09	41%	80	26	49	40	30	98		76									110	124	49	116	<80%
101	Hillway T/F	AT290	160	61.64	39%	20	23	41	25	32	52	81	43	6	5	7	3					58	81	129	71	<80%
102	Mapalagama Central	AT330	160	37.95	24%	57	58	28			7	15										57	65	43	0	<80%
103	Silvery T/F	AT410	160	106.03	66%	58	38	40	18	125	100	100	26									183	138	140	44	<80%
104	Nagoda walauwatta	AT420	160	117.5	73%	55	65	85	27	13	36	47	37	56	45	57	14	38	7	3	36	163	157	190	114	80% -100%
105	Gonalagoda	AT430	160	121.67	76%	14	38	80	20	38	32	125	90	60	100	42	50					112	170	247	160	>100%
106	Ranavirugama	AT440	160	99.36	62%	109	102	86	17	63	30	42	23									172	132	128	40	<80%
107	Keppitiyagoda	AT450	160	73.14	46%	80	14	24	70	30	80	90	21									110	94	114	91	<80%
108	Udalamattha	AT480	160	139.38	87%	90	90	70	26	75	100	115	12	10	16	40						175	206	225	38	80% -100%
109	Rukmalgoda	AT500	160	105.34	66%	102	36	45	57	8	32	14	24	69	80	72	20					179	148	131	101	<80%
110	Rathnaudagama	AG020	160	125.81	79%	42	32	54	22	129	94	69	30	27	32	68	31					198	158	191	83	80% -100%
111	Rejjipura	AG040	160	99.36	62%	55	48	61	18	95	75	98	15									150	123	159	33	<80%
112	Imbulgoda	AG050	160	117.99	74%	60	55	55	5	73	65	70	5	40	35	60	10					173	155	185	20	80% -100%
113	Panwila	AG060	160	82.34	51%	45	52	66	20	61	59	75	19									106	111	141	39	<80%
114	Mawadawila	AG070	160	91.77	57%	76	56	29	44	2	3	1	2	57	61	114	56					135	120	144	102	<80%
115	Dewapathiraja School	AG086	160	6.44	4%	8	10	10	5													8	10	10	5	<80%
116	Thelwatta	AG120	160	71.76	45%	49	55	30	20	68	70	40	25									117	125	70	45	<80%
117	Kiralagahawila	AG140	160	82.8	52%	50	45	45	6	75	85	60	25									125	130	105	31	<80%
118	Jo Lanka	AG195	160	127.65	80%	190	180	185	6													190	180	185	6	80% -100%
119	Veihena	AG250	160	31.05	19%	44	49	42														44	49	42	0	<80%
120	Indurupathwila	AG260	160	111.09	69%	65	18	4		63	81	88	32	71	41	52	21	0	0	0	0	199	140	144	53	80% -100%
121	Nayapamula	AG280	160	72.91	46%	34	29	38	5	52	48	62	12	15	18	21	5					101	95	121	22	<80%
122	Halpathota Gin Ganga Wo	AG290	160	96.14	60%	54	68	75	20	76	61	84	26									130	129	159	46	<80%
123	Halpatota New city	AG295	160	57.96	36%	42	34	39	6	45	51	41	10									87	85	80	16	<80%

124	Arachchikanda	AG330	160	72.059	45%	44	49	20	30		18	13	1	17		75	42	24	43		12	1	14	13		149	105	59	103	<80%
125	Dodankahawila	AG340	160	131.79	82%	71	80	65	25		40	36	25	15		98	83	75	20							209	199	165	60	80% -100%
126	Ginimellagaha West	AG350	160	86.25	54%	52	96	32	59		45	31	27	29		34	40	18	28							131	167	77	116	<80%
127	Sirikandura watta	AG355	160	68.54	43%	64	52	59	6		36	39	48	17												100	91	107	23	<80%
128	Keradewela Majuwana	AG360	160	112.47	70%	10	12	8	5		80	90	72	19		17	35	34	20		30	48	53	25		137	185	167	69	80% -100%
129	Horagampita	AG400	160	104.88	66%	20	18	15	3		56	44	55	5 #		38	44	29	18		37	52	48	8		151	158	147	34	<80%
130	Baddegama new Bridge	AG420	160	119.6	75%	44	50	103	45		15	15	30	20		70	86	64	13		20	21	2	0		149	172	199	78	80% -100%
131	Baddegama WaterSupp. 1	AG430	160	52.9	33%	75	78	77	3																	75	78	77	3	<80%
132	Ruksarasewana	AG475	160	22.31	14%	20	22	34	17		0	0	9	9		8	4	0	6							28	26	43	32	<80%
133	Henegoda	AG515	160	95.68	60%	44	39	51	12		42	34	28	14		66	54	58	8							152	127	137	34	<80%
134	Ganegama South	AG580	160	82.8	52%	81	48	92	28		51	48	40	12												132	96	132	40	<80%

