

HASIL SIMULASI GANGGUAN HUBUNG SINGKAT TIGA FASA PADA TIPIKAL KOORDINASI 1

Fault at bus: **Bus#15**

Prefault voltage = 2.400 kV

Contribution		3-Phase Fault	
From Bus ID	To Bus ID	% V From Bus	kA Symm. rms
Bus#15	Total	0.00	3.507
Bus Outgoing 63-MCC-2	Bus#15	96.14	3.411
B-BF4101	Bus#15	104.35	0.267

Fault at bus: **Bus#17**

Prefault voltage = 2.400 kV

Contribution		3-Phase Fault	
From Bus ID	To Bus ID	% V From Bus	kA Symm. rms
Bus#17	Total	0.00	24.050
Bus Outgoing 63-MCC-2	Bus#17	24.03	22.282
C-GA2001	Bus#17	104.35	1.831

Fault at bus: **Bus Outgoing 63-MCC-2**

Prefault voltage = 2.400 kV

Contribution		3-Phase Fault	
From Bus ID	To Bus ID	% V From Bus	kA Symm. rms
Bus Outgoing 63-MCC-2	Total	0.00	29.660
Bus#17	Bus Outgoing 63-MCC-2	1.95	1.805
Bus#14	Bus Outgoing 63-MCC-2	17.82	1.323
Bus#15	Bus Outgoing 63-MCC-2	7.39	0.262
Bus Incoming 63-MCC-2	Bus Outgoing 63-MCC-2	81.94	26.283

Fault at bus: **Bus Incoming 63-MCC-2**

Prefault voltage = 13.800 kV

Contribution		3-Phase Fault	
From Bus ID	To Bus ID	% V From Bus	kA Symm. rms
Bus Incoming 63-MCC-2	Total	0.00	24.048
Bus Outgoing 63-MCC-2	Bus Incoming 63-MCC-2	9.53	0.532
Bus Incoming 63-MCC-3B	Bus 63-LBS-1A	0.04	0.173
.	Main Bus 00-SG-1	5.87	21.842
00-MCC-2	Main Bus 00-SG-1	35.80	0.629
61-MCC-3.	Main Bus 00-SG-1	27.96	0.292
62-MCC-3A	Main Bus 00-SG-1	23.30	0.260
62-MCC-3B	Main Bus 00-SG-1	31.63	0.353
63-MCC-3C	Main Bus 00-SG-1	0.94	0.008
Bus Outgoing 63-MCC-3A	Bus Incoming 63-MCC-3A	11.37	0.117

HASIL SIMULASI GANGGUAN HUBUNG SINGKAT TIGA FASA PADA TIPIKAL KOORDINASI 2

Fault at bus: **Bus#9**

Prefault voltage = 0.400 kV

Contribution		3-Phase Fault		Contribution		3-Phase Fault	
From Bus ID	To Bus ID	% V From Bus	kA Symm. rms	From Bus ID	To Bus ID	% V From Bus	kA Symm. rms
Bus#9	Total	0.00	16.119	Bus#10	Total	0.00	16.921
Bus Motor 380V 63-MCC-3B	Bus#9	77.03	15.787	Bus Motor 380V 63-MCC-3B	Bus#10	62.22	15.922
W-GA1005AM	Bus#9	100.00	0.462	I-GE5001M	Bus#10	105.26	1.055

Fault at bus: **Bus#10**

Prefault voltage = 0.400 kV

Fault at bus: **Bus Motor 380V 63-MCC-3B**

Prefault voltage = 0.400 kV

Contribution		3-Phase Fault		Contribution		3-Phase Fault	
From Bus ID	To Bus ID	% V From Bus	kA Symm. rms	From Bus ID	To Bus ID	% V From Bus	kA Symm. rms
Bus Motor 380V 63-MCC-3B	Total	0.00	41.233	Bus Outgoing 63-MCC-3B	Total	0.00	41.233
Bus#9	Bus Motor 380V 63-MCC-3B	2.23	0.458	Bus Incoming 63-MCE-3	Bus Outgoing 63-MCC-3B	5.04	4.242
Bus#10	Bus Motor 380V 63-MCC-3B	3.98	1.018	Bus Incoming 63-MCC-3B	Bus Outgoing 63-MCC-3B	95.91	34.076
Bus24	Bus Motor 380V 63-MCC-3B	6.30	1.522	Bus#9	Bus Motor 380V 63-MCC-3B	2.23	0.458
Bus Incoming 63-MCE-3	Bus Outgoing 63-MCC-3B	5.04	4.242	Bus#10	Bus Motor 380V 63-MCC-3B	3.98	1.018
Bus Incoming 63-MCC-3B	Bus Outgoing 63-MCC-3B	95.91	34.076	Bus24	Bus Motor 380V 63-MCC-3B	6.30	1.522

HASIL SIMULASI GANGGUAN HUBUNG SINGKAT TIGA FASA PADA TIPIKAL KOORDINASI 3

Fault at bus: **Bus Incoming 63-MCC-3B**

Prefault voltage = 13.800 kV

Contribution		3-Phase Fault	
From Bus ID	To Bus ID	% V From Bus	kA Symm. rms
Bus Incoming 63-MCC-3B	Total	0.00	22.788
Bus 63-LBS-1A	Bus Incoming 63-MCC-3B	5.51	22.620
Bus Outgoing 63-MCC-3B	Bus Incoming 63-MCC-3B	16.85	0.174

Fault at bus: **Bus 63-LBS-1A**

Prefault voltage = 13.800 kV

Contribution		3-Phase Fault	
From Bus ID	To Bus ID	% V From Bus	kA Symm. rms
Bus 63-LBS-1A	Total	0.00	24.048
Bus Incoming 63-MCC-3B	Bus 63-LBS-1A	0.04	0.173
.	Main Bus 00-SG-1	5.87	21.842
00-MCC-2	Main Bus 00-SG-1	35.80	0.629
61-MCC-3	Main Bus 00-SG-1	27.96	0.292
62-MCC-3A	Main Bus 00-SG-1	23.30	0.260
62-MCC-3B	Main Bus 00-SG-1	31.63	0.353
63-MCC-3C	Main Bus 00-SG-1	0.94	0.008
Bus Outgoing 63-MCC-3A	Bus Incoming 63-MCC-3A	11.37	0.117
Bus Outgoing 63-MCC-2	Bus Incoming 63-MCC-2	9.53	0.532

PENYETELAN *PHASE OVERCURRENT RELAY* SECARA KONVENSIONAL

Tipikal Koordinasi Fuzzy 1 (Bus Beban 63-MCC-2 - Bus Incoming 63-MCC-2)

Relay 15 (Relay Motor B-BF4101)

Kurva	= Very Inverse
Rasio CT	= 75 / 5
Isc Min Bus Motor B-BF4101	= 2.926,6 A
Isc Max Bus Motor B-BF4101	= 3.403 A
Full Load Ampere (FLA)	= $\frac{151^{1/0,9}}{\sqrt{3} \cdot 2,4 \cdot 0,94} = 43 \text{ A}$

Current Setting V.I.T (I>)

$$\frac{1,1 \times \text{FLA}}{n\text{CT}} I_n \leq I_p \leq \frac{0,8 \times \text{Isc Min Bus Motor B-BF4101}}{n\text{CT}} I_n$$

$$\frac{1,1 \times 43}{75} I_n \leq I_p \leq \frac{0,8 \times 2.926,6}{75} I_n$$

$$\frac{47,3}{75} I_n \leq I_p \leq \frac{2.341,3}{75} I_n$$

$$0,63 I_n \leq I_p \leq 31 I_n$$

Dipilih Tap = 1 In (range CT 0,5 – 2,5 In dengan step 0,01)

Nilai aktual arus setting (I_p) = 1 x 75 = 75 A

Nilai arus relay = 1 x 5 = 5A

Time Setting V.I.T (Time Multiplier Setting)

Waktu operasi yang diinginkan (t_d) = 3 s (memperhitungkan accl motor 2 s)

$$\frac{I}{I_p} = \frac{\text{LRC Motor} \times \text{Faktor Asimetris} \times \text{FLA}}{I_p}$$

$$\frac{I}{I_p} = \frac{700\% \times 1,3 \times 43}{75} = \frac{391,3 \text{ A}}{75 \text{ A}} = 5,2$$

$$T = \frac{[(5,2)^1 - 1] \times 3}{13,5} = 0,93$$

Relay 17 (Relay Motor C-GA2001)

Kurva	= Very Inverse
Rasio CT	= 400/5
Isc Min Bus Motor C-GA2001	= 18.768,6 A
Isc Max Bus Motor C-GA2001	= 22.282 A

$$\text{Full Load Ampere (FLA)} = \frac{1150 / 0,86}{\sqrt{3} \cdot 2,4 \cdot 0,92} = 346 \text{ A}$$

Current Setting V.I.T (I>)

$$\frac{1,1 \times \text{FLA}}{n_{CT}} I_n \leq I_p \leq \frac{0,8 \times \text{Isc Min Bus Motor C-GA2001}}{n_{CT}} I_n$$

$$\frac{1,1 \times 346}{400} I_n \leq I_p \leq \frac{0,8 \times 18.768,6}{400} I_n$$

$$\frac{380,6}{400} I_n \leq I_p \leq \frac{15.014,9}{400} I_n$$

$$0,95 I_n \leq I_p \leq 37 I_n$$

Dipilih Tap = 1In (range CT 0,5 – 2,5 In dengan step 0,01)

Nilai aktual arus setting (I_p) = 1 x 400 = 400 A

Nilai arus relay = 1 x 5 = 5 A

Time Setting V.I.T (Time Multiplier Setting)

Waktu operasi yang diinginkan (t_d) = 2 s (memperhitungkan accl motor 1 s)

$$\frac{I}{I_p} = \frac{\text{LRC Motor} \times \text{Faktor Asimetris} \times \text{FLA}}{I_p}$$

$$\frac{I}{I_p} = \frac{500\% \times 1,3 \times 346}{400} = \frac{2249 \text{ A}}{400 \text{ A}} = 5,6$$

$$T = \frac{[(5,6)^1 - 1] \times 2}{13,5} = 0,68$$

Relay Bus Outgoing 63-MCC-2

Kurva	= Very Inverse
Rasio CT	= 700/5
Isc Min Bus Outgoing 63-MCC-2	= 22.603,38 A
Isc Max Bus Outgoing 63-MCC-2	= 26.283 A

Full Load Ampere (FLA) = 579,9 A

Current Setting V.I.T (I>)

$$\frac{1,1 \times \text{FLA}}{n\text{CT}} I_n \leq I_p \leq \frac{0,8 \times \text{Isc Min Bus Outgoing 63-MCC-2}}{n\text{CT}} I_n$$

$$\frac{1,1 \times 579,9}{700} I_n \leq I_p \leq \frac{0,8 \times 22.603,38}{700} I_n$$

$$\frac{637,89}{700} I_n \leq I_p \leq \frac{18.082,7}{700} I_n$$

$$0,91 I_n \leq I_p \leq 25,8 I_n$$

Dipilih Tap = 1.3I_n (range CT 0,5 – 2,5 I_n dengan step 0,01)

Nilai aktual arus setting (I_p) = 1.3 x 700 = 910 A

Nilai arus relay = 1.3 x 5 = 6.5 A

Time Setting V.I.T (Time Multiplier Setting)

Waktu operasi yang diinginkan (t_d) = 0,4 s

$$\frac{I}{I_p} = \frac{\text{Isc Max Bus Outgoing 63 – MCC – 2}}{I_p}$$

$$\frac{I}{I_p} = \frac{26.283}{910} = 28,9$$

$$T = \frac{[(28,9)^{1-1}] \times 0,4}{13,5} = 0,83$$

Relay Bus Incoming 63-MCC-2

Kurva	= Very Inverse
Rasio CT	= 300/5
Isc Min Bus Incoming 63-MCC-2	= 20. 253,86 A
Isc Max Bus Incoming 63-MCC-2	= 23.551 A
Full Load Ampere (FLA)	= 100,9 A

Current Setting V.I.T (I>)

$$\frac{1,1 \times \text{FLA}}{n\text{CT}} I_n \leq I_p \leq \frac{0,8 \times \text{Isc Min Bus Incoming 63-MCC-2}}{n\text{CT}} I_n$$

$$\frac{1,1 \times 100,9}{300} I_n \leq I_p \leq \frac{0,8 \times 20253,86}{300} I_n$$

$$\frac{110,99}{300} I_n \leq I_p \leq \frac{16.203,9}{300} I_n$$

$$0,37 I_n \leq I_p \leq 54 I_n$$

Dipilih Tap = 1In (range CT 0,5 – 2,5 In dengan step 0,01)

Nilai aktual arus setting (I_p) = 1 x 300 = 300 A

Nilai arus relay = 1 x 5 = 5 A

Time Setting V.I.T (Time Multiplier Setting)

Waktu operasi yang diinginkan (t_d) = 0,15 s

$$\frac{I}{I_p} = \frac{\text{Isc Max Bus Incoming 63 - MCC - 2}}{I_p}$$

$$\frac{I}{I_p} = \frac{23.551}{300} = 78,5$$

$$T = \frac{[(78,5)^1 - 1] \times 0,15}{13,5} = 0,86$$

Tipikal Koordinasi Fuzzy 2 (Bus Beban 63-MCC-3 - Bus Outgoing 63-MCC-3B)

Relay 9 (Relay Motor W-GA1005AM)

Kurva = Very Inverse

Rasio CT = 100/5

Isc Min Bus Motor W-GA1005AM = 13.550,2 A

Isc Max Bus Motor W-GA1005AM = 15.787 A

$$\text{Full Load Ampere (FLA)} = \frac{45^{0,87}}{\sqrt{3} \cdot 0,4 \cdot 0,93} = 80,28 \text{ A}$$

Current Setting V.I.T (I>)

$$\frac{1,1 \times \text{FLA}}{n_{CT}} I_n \leq I_p \leq \frac{0,8 \times \text{Isc Min Bus Motor W-GA1005AM}}{n_{CT}} I_n$$

$$\frac{1,1 \times 80,28}{100} I_n \leq I_p \leq \frac{0,8 \times 13.550,2}{100} I_n$$

$$\frac{88,31}{100} I_n \leq I_p \leq \frac{10840,2}{100} I_n$$

$$0,88 I_n \leq I_p \leq 108,4 I_n$$

Dipilih Tap = 2,4 In (range CT 0,5 – 2,5 In dengan step 0,01)

Nilai aktual arus setting (Ip) = 2,4 x 100 = 240 A

Nilai arus relay = 2,4 x 5 = 12 A

Time Setting V.I.T (Time Multiplier Setting)

Waktu operasi yang diinginkan (td) = 4 s (memperhitungkan accl motor 2 s)

$$\frac{I}{I_p} = \frac{\text{LRC Motor} \times \text{Faktor Asimetris} \times \text{FLA}}{I_p}$$

$$\frac{I}{I_p} = \frac{700\% \times 1,3 \times 80,28}{240} = \frac{730,548 \text{ A}}{240 \text{ A}} = 3$$

$$T = \frac{[(3)^1 - 1] \times 4}{13,5} = 0,6$$

Relay 10 (Relay Motor I-GB5001M)

Kurva	= Very Inverse
Rasio CT	= 450/5
Isc Min Bus Motor I-GB5001M	= 13.669,7 A
Isc Max Bus Motor I-GB5001M	= 15.922 A

$$\text{Full Load Ampere (FLA)} = \frac{220^{0,9}}{\sqrt{3} \cdot 0,4 \cdot 0,95} = 371,4 \text{ A}$$

Current Setting V.I.T (I>)

$$\frac{1,1 \times \text{FLA}}{n\text{CT}} I_n \leq I_p \leq \frac{0,8 \times \text{Isc Min Bus Motor I-GB5001M}}{n\text{CT}} I_n$$

$$\frac{1,1 \times 371,4}{450} I_n \leq I_p \leq \frac{0,8 \times 13669,7}{450} I_n$$

$$\frac{408,5}{450} I_n \leq I_p \leq \frac{10935,76}{450} I_n$$

$$0,9 I_n \leq I_p \leq 24 I_n$$

Dipilih Tap = 1,8 I_n (range CT 0,5 – 2,5 I_n dengan step 0,01)

Nilai aktual arus setting (I_p) = 1,8 x 450 = 810 A

Nilai arus relay = 1,8 x 5 = 9 A

Time Setting V.I.T (Time Multiplier Setting)

Waktu operasi yang diinginkan (t_d) = 3 s (memperhitungkan accl motor 2 s)

$$\frac{I}{I_p} = \frac{\text{LRC Motor} \times \text{Faktor Asimetris} \times \text{FLA}}{I_p}$$

$$\frac{I}{I_p} = \frac{600\% \times 1,3 \times 371,4}{810} = \frac{2896,92 \text{ A}}{810 \text{ A}} = 3,6$$

$$T = \frac{[(3,6)^1 - 1] \times 3}{13,5} = 0,58$$

Relay Bus Motor 380 V 63-MCC-3B

Kurva	= Very Inverse
Rasio CT	= 1500/5
Isc Min Bus Motor 380 V 63-MCC-3B	= 32.716,1 A
Isc Max Bus Motor 380 V 63-MCC-3B	= 38.240 A
Full Load Ampere (FLA)	= 758,8 A

Current Setting V.I.T (I>)

$$\frac{1,1 \times \text{FLA}}{n\text{CT}} I_n \leq I_p \leq \frac{0,8 \times \text{Isc Min Bus Motor 380 V 63-MCC-3B}}{n\text{CT}} I_n$$

$$\frac{1,1 \times 758,8}{1500} I_n \leq I_p \leq \frac{0,8 \times 32.716,1}{1500} I_n$$

$$\frac{834,68}{1500} I_n \leq I_p \leq \frac{28.135,9}{1500} I_n$$

$$0,56 I_n \leq I_p \leq 18,7 I_n$$

Dipilih Tap = 1,7 In (range CT 0,5 – 2,5 In dengan step 0,01)

Nilai aktual arus setting (Ip) = 1,7 x 1500 = 2550 A

Nilai arus relay = 1,7 x 5 = 8,5 A

Time Setting V.I.T (Time Multiplier Setting)

Waktu operasi yang diinginkan (td) = 0.3 s

$$\frac{I}{I_p} = \frac{\text{Isc Max Bus Motor 380 V 63 – MCC – 3B}}{I_p}$$

$$\frac{I}{I_p} = \frac{38.240 \text{ A}}{2.550 \text{ A}} = 14,9$$

$$T = \frac{[(14,9)^1 - 1] \times 0,3}{13,5} = 0,31$$

Relay Outgoing Bus 63-MCC-3B

Kurva	= Very Inverse
Rasio CT	= 2200/5
Isc Min Bus Outgoing Bus 63-MCC-3B	= 29.131,6 A
Isc Max Bus Outgoing Bus 63-MCC-3B	= 34.076 A
Full Load Ampere (FLA)	= 1897,7 A

Current Setting V.I.T (I>)

$$\frac{1,1 \times \text{FLA}}{n\text{CT}} I_n \leq I_p \leq \frac{0,8 \times \text{Isc Min Bus Outgoing Bus 63-MCC-3B}}{n\text{CT}} I_n$$

$$\frac{1,1 \times 1897,7}{2200} I_n \leq I_p \leq \frac{0,8 \times 29.131,6}{2200} I_n$$

$$\frac{2087,5}{2200} I_n \leq I_p \leq \frac{23.305,28}{2200} I_n$$

$$0,95 I_n \leq I_p \leq 10,6 I_n$$

Dipilih Tap = I_n (range CT 0,5 – 2,5 I_n dengan step 0,01)

Nilai aktual arus setting (I_p) = $0,95 \times 2200 = 2090 \text{ A}$

Nilai arus relay = $0,95 \times 5 = 4,75 \text{ A}$

Time Setting V.I.T (Time Multiplier Setting)

Waktu operasi yang diinginkan (t_d) = 0.5 s

$$\frac{I}{I_p} = \frac{\text{Isc Max Bus Outgoing Bus 63 – MCC – 3B}}{I_p}$$

$$\frac{I}{I_p} = \frac{34.076 \text{ A}}{2090 \text{ A}} = 16,3$$

$$T = \frac{[(16,3)^1 - 1] \times 0,5}{13,5} = 0,57$$

Tipikal Koordinasi Fuzzy 3 (Bus Beban 63-MCC-2 - Bus Incoming 63-MCC-2)

Relay Incoming Bus 63-MCC-3B

Kurva	= Very Inverse
Rasio CT	= 75/5
Isc Min Bus Incoming Bus 63-MCC-3B	= 16.814,72 A
Isc Max Bus Incoming Bus 63-MCC-3B	= 22.620 A
Full Load Ampere (FLA)	= 55 A

Current Setting V.I.T (I>)

$$\frac{1,1 \times \text{FLA}}{n_{\text{CT}}} I_n \leq I_p \leq \frac{0,8 \times \text{Isc Min Bus Incoming Bus 63-MCC-3B}}{n_{\text{CT}}} I_n$$

$$\frac{1,1 \times 55}{75} I_n \leq I_p \leq \frac{0,8 \times 16.814,72}{75} I_n$$

$$\frac{60,5}{75} I_n \leq I_p \leq \frac{13451,8}{75} I_n$$

$$0,8 I_n \leq I_p \leq 178,6 I_n$$

Dipilih Tap = 0,82 In (range CT 0,5 – 2,5 In dengan step 0,01)

Nilai aktual arus setting (Ip) = 0,82 x 75 = 61,5 A

Nilai arus relay = 0,82 x 5 = 4,1 A

Time Setting V.I.T (Time Multiplier Setting)

Waktu operasi yang diinginkan (td) = 0,03 s

$$\frac{I}{I_p} = \frac{\text{Isc Max Bus Incoming Bus 63 – MCC – 3B}}{I_p}$$

$$\frac{I}{I_p} = \frac{22.620 \text{ A}}{61,5 \text{ A}} = 367,8$$

$$T = \frac{[(367,8)^1 - 1] \times 0,03}{13,5} = 0,82$$

Relay Outgoing Bus 63-LBS-1A

Kurva	= Very Inverse
Rasio CT	= 600/5
Isc Min Bus Outgoing 63-LBS-1A	= 20.013,06 A
Isc Max Bus Outgoing 63-LBS-1A	= 23.271 A

Full Load Ampere (FLA) = 184,3 A

Current Setting V.I.T (I>)

$$\frac{1,1 \times \text{FLA}}{n\text{CT}} I_n \leq I_p \leq \frac{0,8 \times \text{Isc Min Bus Outgoing 63-LBS-1A}}{n\text{CT}} I_n$$

$$\frac{1,1 \times 184,3}{600} I_n \leq I_p \leq \frac{0,8 \times 20.013,06}{600} I_n$$

$$\frac{202,73}{600} I_n \leq I_p \leq \frac{13.396,1}{600} I_n$$

$$0,34 I_n \leq I_p \leq 178,6 I_n$$

Dipilih Tap = 0,6 In (range CT 0,5 – 2,5 In dengan step 0,01)

Nilai aktual arus setting (Ip) = 0,6 x 600 = 360 A

Nilai arus relay = 0.6 x 5 = 3 A

Time Setting V.I.T (Time Multiplier Setting)

Waktu operasi yang diinginkan (td) = 0,2 s

$$\frac{I}{I_p} = \frac{\text{Isc Max Bus Outgoing 63-LBS-1A}}{I_p}$$

$$\frac{I}{I_p} = \frac{23.271 \text{ A}}{360 \text{ A}} = 64,6$$

$$T = \frac{[(64,6)^1 - 1] \times 0,2}{13,5} = 0,94$$

Relay Incoming Bus 63-LBS-1A

Kurva	= Very Inverse
Rasio CT	= 500/5
Isc Min Bus Incoming 63-LBS-1A	= 20.013,06 A
Isc Max Bus Incoming 63-LBS-1A	= 23.271 A

Full Load Ampere (FLA) = 184,3 A

Current Setting V.I.T (I>)

$$\frac{1,1 \times \text{FLA}}{n\text{CT}} I_n \leq I_p \leq \frac{0,8 \times \text{Isc Min Bus Incoming 63-LBS-1A}}{n\text{CT}} I_n$$

$$\frac{1,1 \times 184,3}{500} I_n \leq I_p \leq \frac{0,8 \times 20.013,06}{500} I_n$$

$$\frac{202,73}{500} I_n \leq I_p \leq \frac{13.684,32}{500} I_n$$

$$0,41 I_n \leq I_p \leq 27,4 I_n$$

Dipilih Tap = 0,73 In (range CT 0,5 – 2,5 In dengan step 0,01)

Nilai aktual arus setting (I_p) = 0,73 x 500 = 365 A

Nilai arus relay = 0,73 x 5 = 3,65 A

Time Setting V.I.T (Time Multiplier Setting)

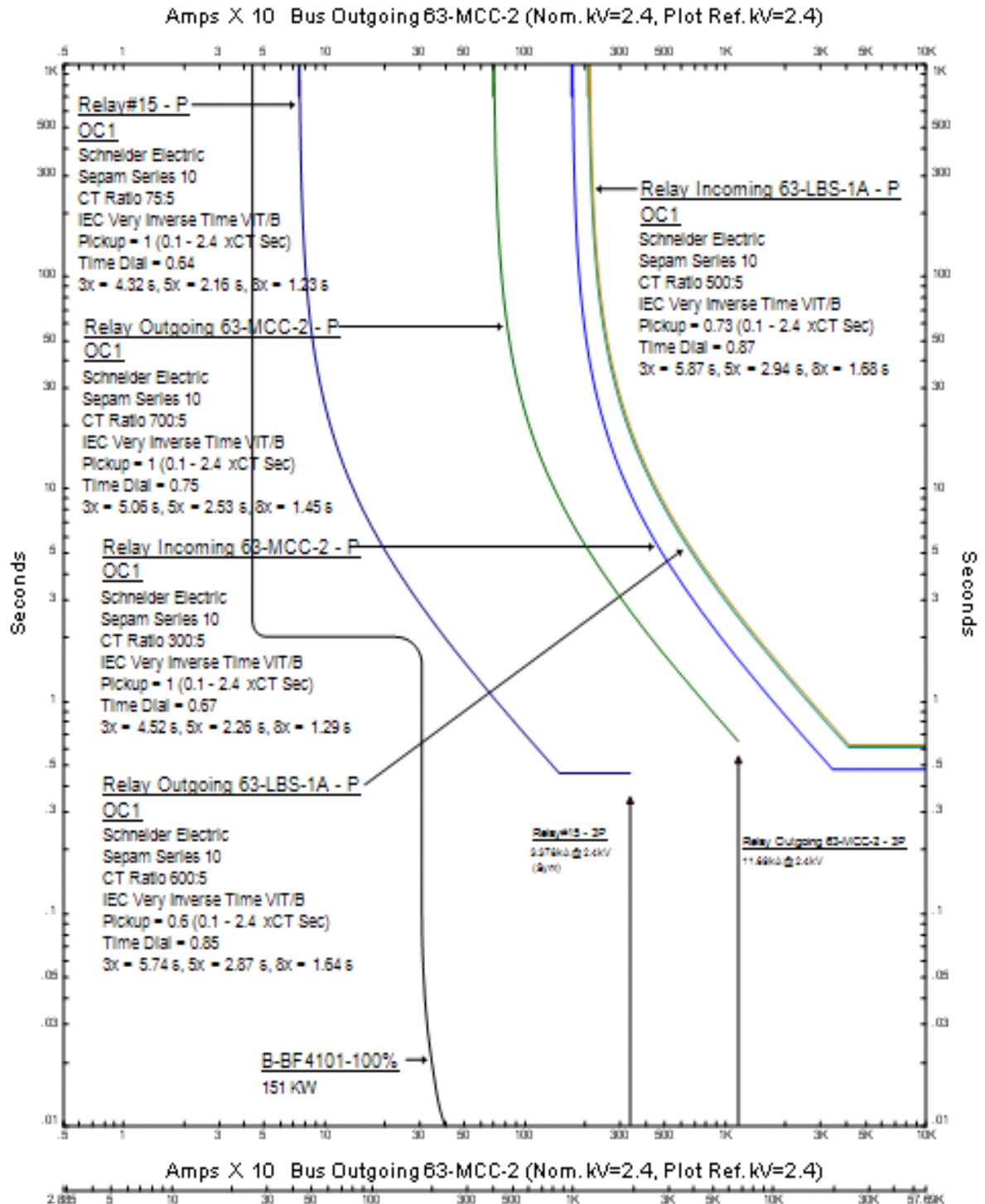
Waktu operasi yang diinginkan (t_d) = 0,21 s

$$\frac{I}{I_p} = \frac{\text{Isc Max Bus Incoming 63-LBS-1A}}{I_p}$$

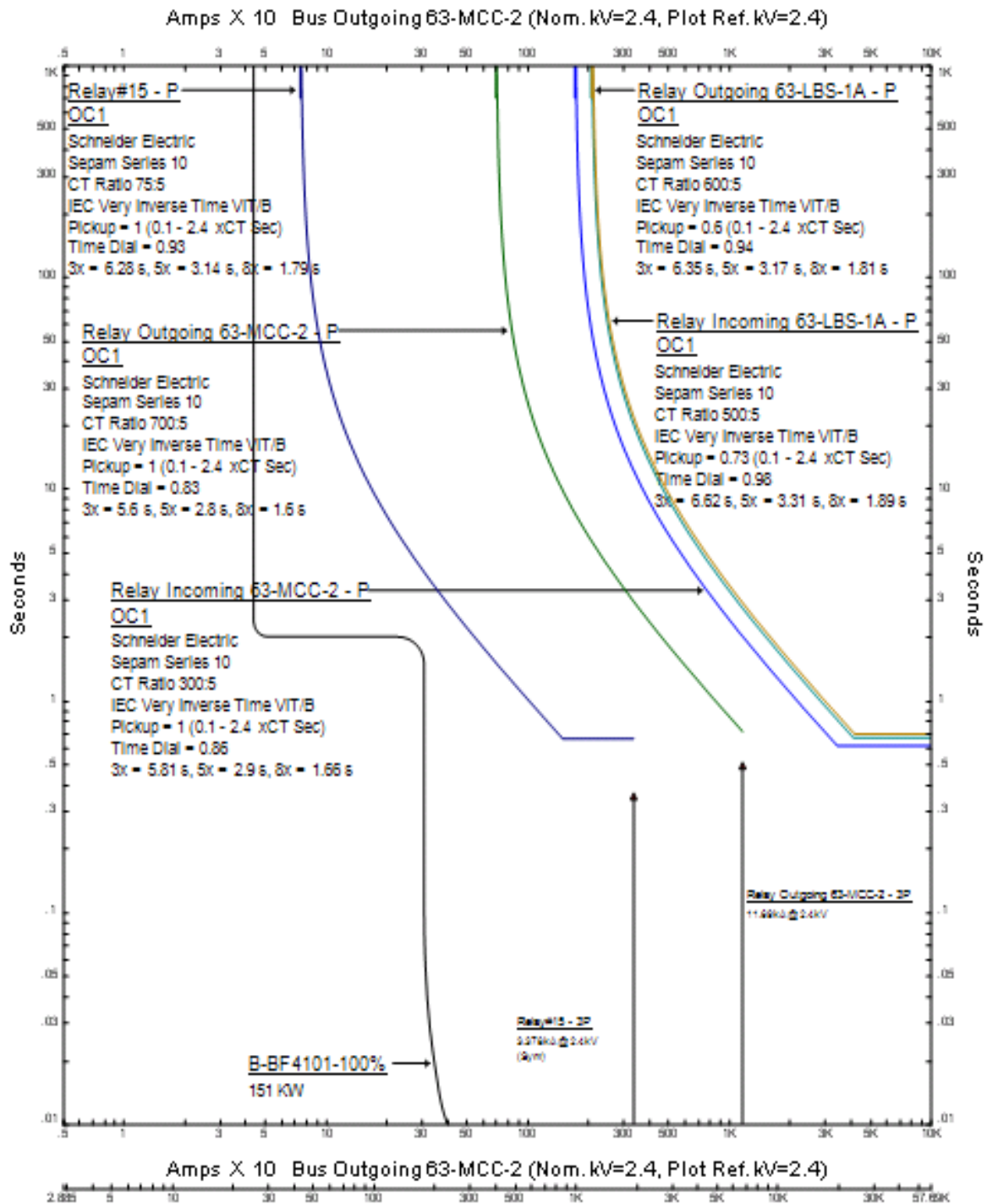
$$\frac{I}{I_p} = \frac{23.271 \text{ A}}{365 \text{ A}} = 63,8$$

$$T = \frac{[(63,8)^1 - 1] \times 0,21}{13,5} = 0,98$$

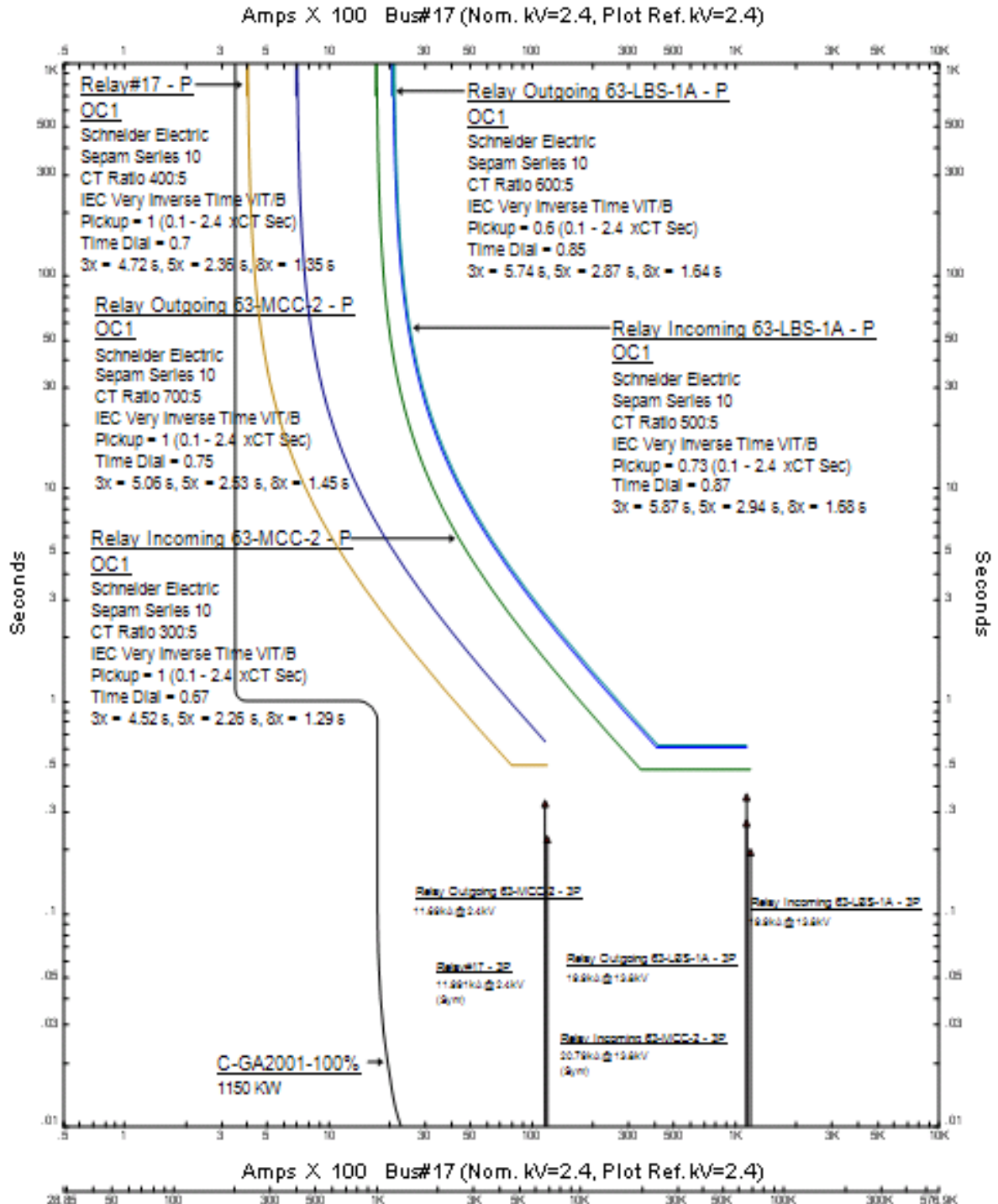
PLOT TCC RELAY MOTOR B-BF4101 HINGGA RELAY BUS INCOMING 63-LBS-1A
BERBASIS FUZZY LOGIC



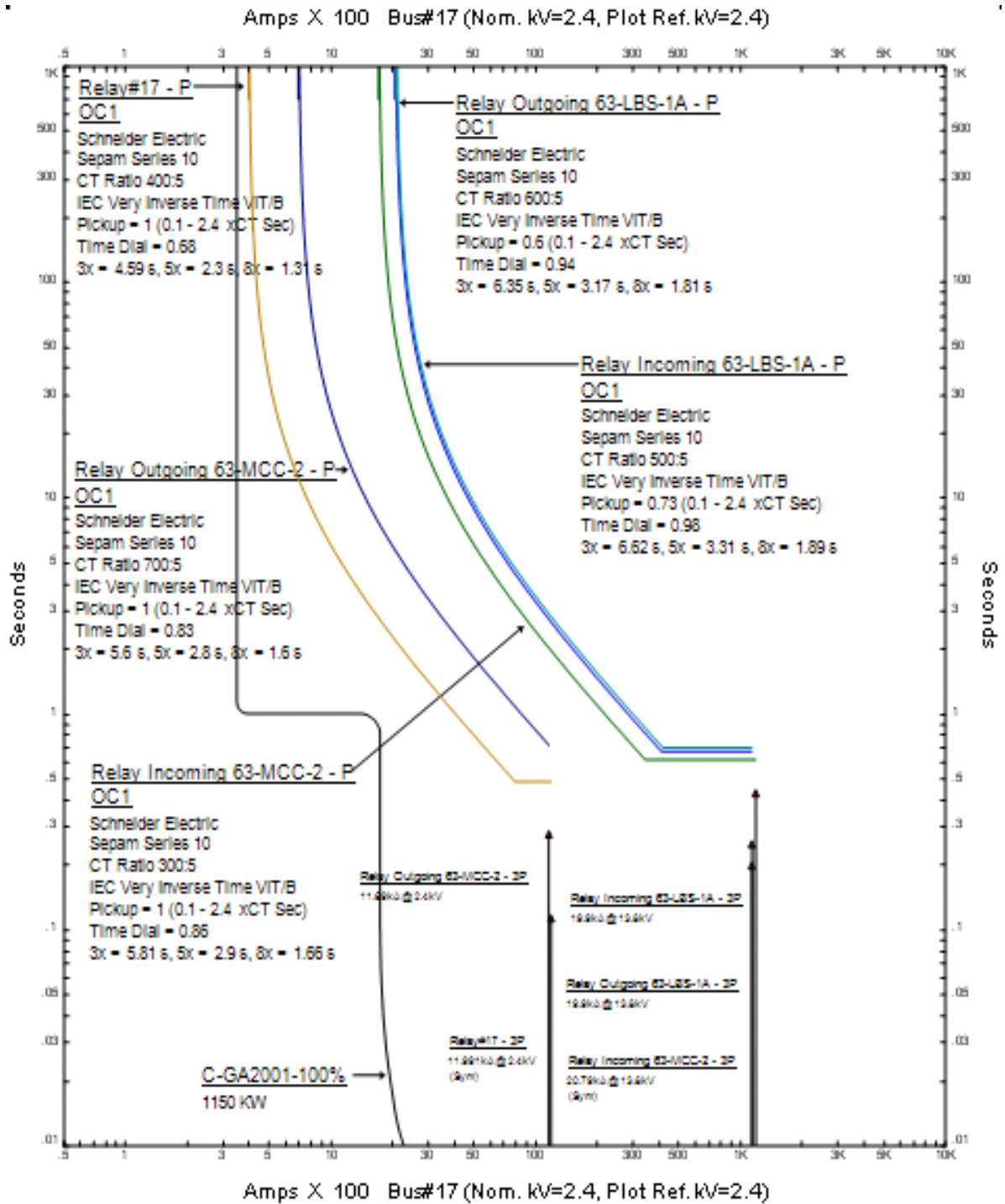
PLOT TCC RELAY MOTOR B-BF4101 HINGGA RELAY BUS INCOMING 63-LBS-1A
 SECARA KONVENSIONAL



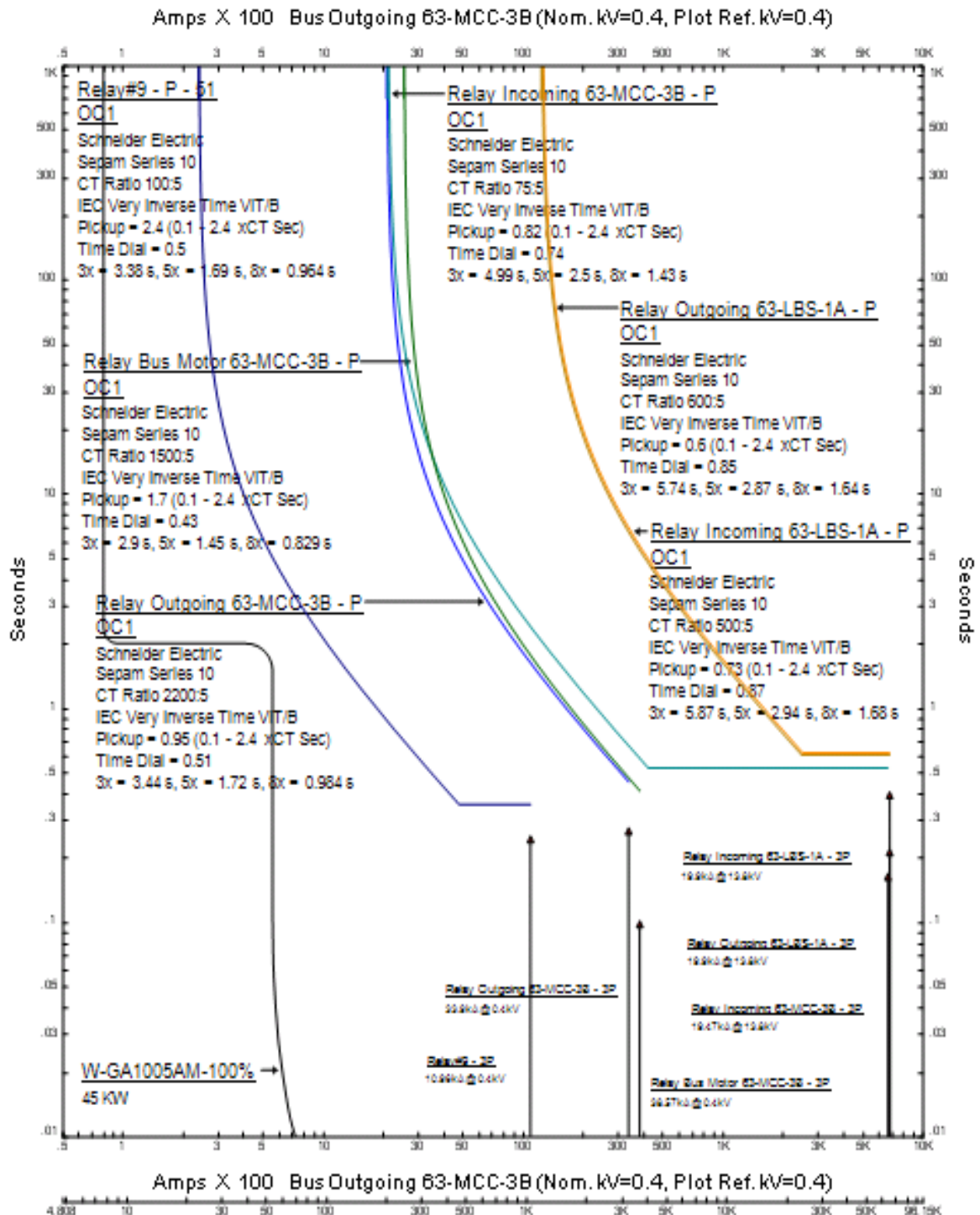
PLOT TCC RELAY MOTOR C-GA2001 HINGGA RELAY BUS INCOMING 63-LBS-1A
BERBASIS FUZZY LOGIC



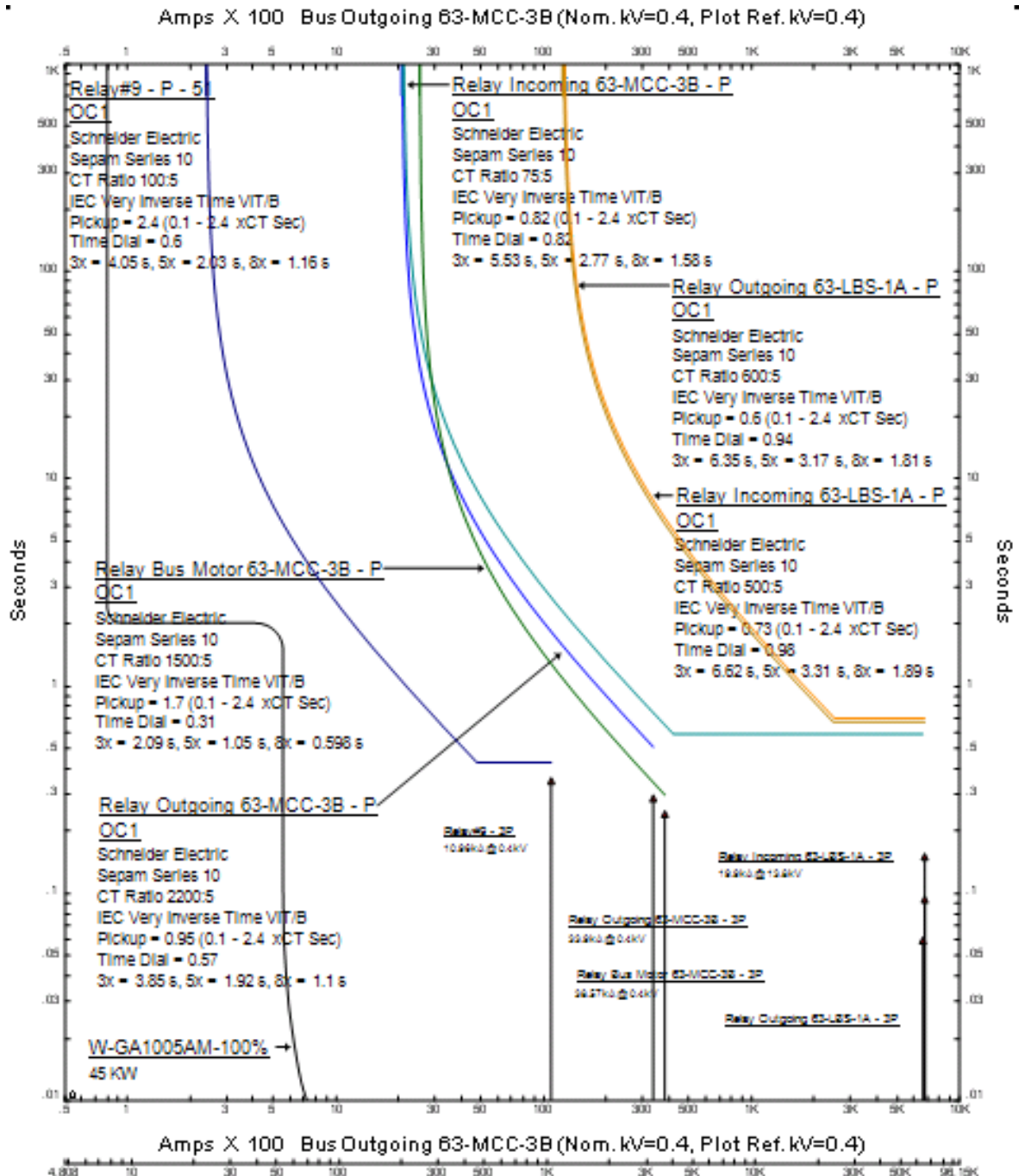
PLOT TCC RELAY MOTOR C-GA2001 HINGGA RELAY BUS INCOMING 63-LBS-1A
 SECARA KONVENSIIONAL



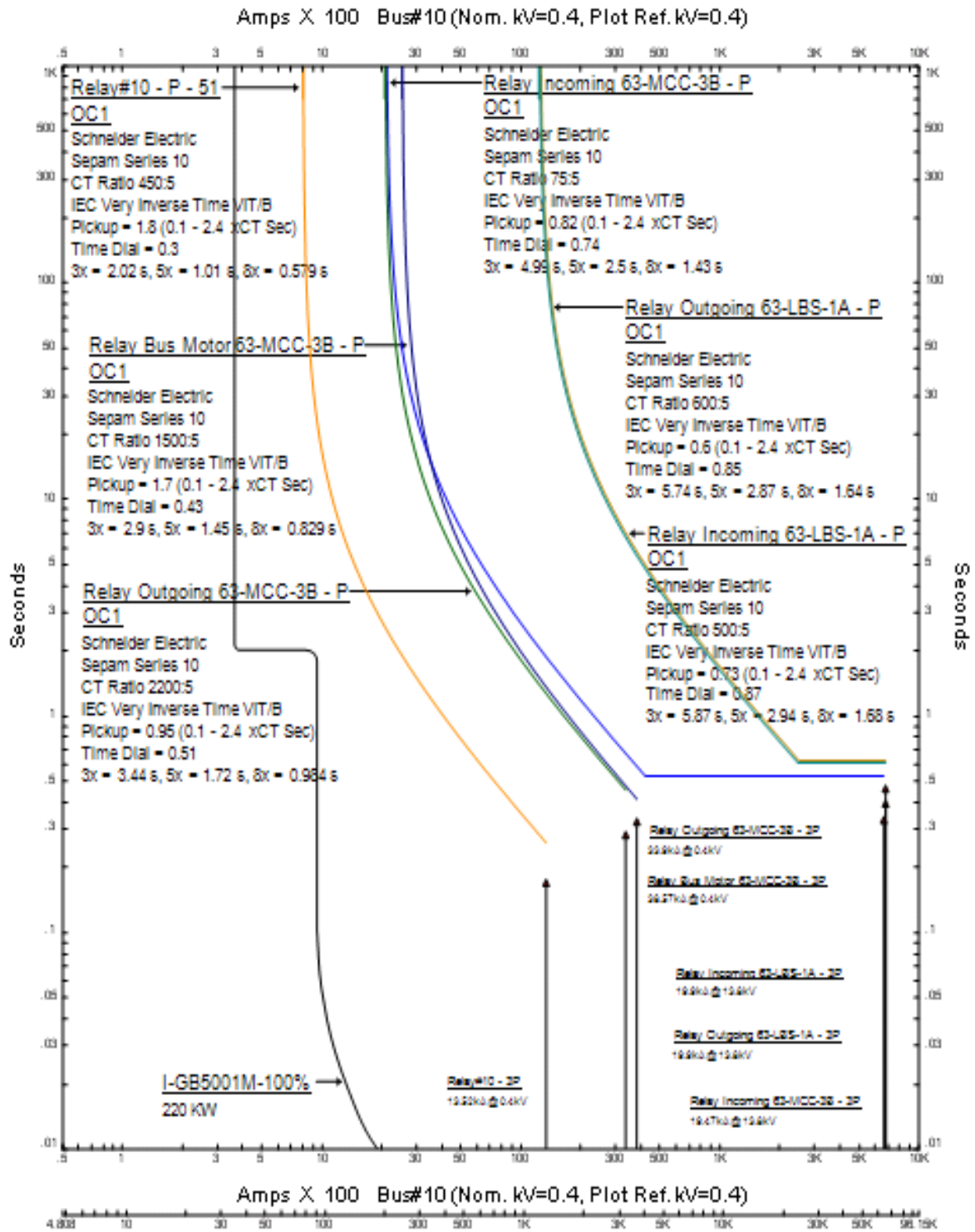
PLOT TCC RELAY MOTOR W-GA1005AM HINGGA RELAY BUS INCOMING 63-LBS-1A BERBASIS FUZZY LOGIC



PLOT TCC RELAY MOTOR W-GA1005AM HINGGA RELAY BUS INCOMING 63-LBS-1A BERBASIS KONVENSIONAL



PLOT TCC RELAY MOTOR I-GB5001M HINGGA RELAY BUS INCOMING 63-LBS-1A BERBASIS FUZZY LOGIC



PLOT TCC RELAY MOTOR I-GB5001M HINGGA RELAY BUS INCOMING 63-LBS-1A SECARA KONVENSIONAL

