

**KTNV Broadcast Facility
Revised Time Current Curves – Rev. 1**

Response to Submittal Comments
April 30, 2007

Job #90149

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Response and General Comments:

The Time Current Curves have been revised as requested by the Design Engineer of Record for the Project. In particular, the Nevada Power service transformer primary fuses have been included on TCCs of concern. Gary Kopps of Nevada Power Company's System Protection department provided information regarding utility fuse selection. A typical and alternative fuse used in their system has been displayed on the TCCs of concern. One will note that each fuse has very similar characteristics.

On other TCCs, the smallest single phase circuit breaker has been shown with Ground Fault pickup and clear times of upstream devices. The Ground Fault pickup values for the upstream devices have been set to their maximum values to achieve the greatest selectivity in the instantaneous region of the smaller (20A – 70A, typically) branch circuit breakers. It should be noted that the nature of Ground Fault fault current pickup generally differs significantly in the short-time region of branch circuit breakers to that of upstream feeder circuit breakers. One will note that overlap occurs in the short-time region. Often, this is unavoidable as described in the original report.

The Breaker Settings tables and revised Fuse Tables have been included with this re-submittal and can directly replace the section starting at page 66.

Breaker Settings

KTNV Broadcast Facility
Adjustable Breaker Settings
4/30/2007 (Rev. 1)

Adjustable Breaker Name	Manufacturer	Type	Style	Sensor/ Frame	Plug/ Tap	LTPU		LT Delay		STPU		Inst		Ground Trip									
						Name	Setting	Multi	Trip (A)	Name	Band	Name	Setting	Trip (A)	Band	121	Setting	Override	Trip (A)	Pickup	Trip (A)	Delay	121
B SES	GE	MVT-Plus	MCCB-SG/SK	1200	1200	LT Pickup	1		1200	LT Delay (s)	1	ST Pickup	3	3600	4	Out	8	Pickup	9600	0.75	900	4	Out
B GEN	GE	MVT-Plus	MCCB-SG/SK	150	100	LTPU	1		100	LT Band		STPU	4	400	2	Out	9	Pickup	900	0.25	37.5	1	Out
B TVSS	GE	MVT-Plus	MCCB-SG/SK	800	800	LT Pickup	1		800	LT Delay (s)		ST Pickup	3.5	2800	3	Out	8	Pickup	6400	0.84	672	3	Out
B DPM	GE	MVT-Plus	MCCB-SG/SK	400	200	LT Pickup	1		200	LT Delay (s)		ST Pickup	8.5	1700	2	Out	10	Pickup	2000	1	400	3	Out
B HA	GE	MVT-Plus	MCCB-SG/SK	400	200	LT Pickup	1		200	LT Delay (s)		ST Pickup	8.5	1700	2	Out	10	Pickup	2000	0.24	96	1	Out
B HB	GE	MVT-Plus	MCCB-SG/SK	400	200	LT Pickup	1		200	LT Delay (s)		ST Pickup	9	900	2	Out	9	Pickup	900	1	150	3	Out
B HX	GE	MVT-Plus	MCCB-SG/SK	150	100	LT Pickup	0.85		170	LT Delay (s)		ST Pickup	8	1530	2	Out	9	Pickup	1800	1	400	3	Out
B TX-DIM	GE	MVT-Plus	MCCB-SG/SK	400	200	LT Pickup	1		250	LT Delay (s)		ST Pickup	8	2000	2	Out	10	Pickup	2500	0.24	96	1	Out
B UPS-CAB	GE	MVT-Plus	MCCB-SG/SK	400	250	LT Pickup	1		250	LT Delay (s)		ST Pickup	8	2000	2	Out	10	Pickup	2500	1	400	3	Out
B UPS-MBP	GE	MVT-Plus	MCCB-SG/SK	400	250	LTPU	1		250	LT Band		STPU	3	637.5	Fixed	In	6	Pickup	1237.5				Out
B MBP	GE	Spectra RMS	MCCB SE	150A (125AT)	125	LT Pickup	1	1	125	LT Delay	Fixed	ST Pickup	6	637.5	Fixed	In	6	Pickup	1237.5				Out
B TX-LA	GE	Spectra RMS	MCCB SE	150A (125AT)	125	LT Pickup	1	1	125	LT Band		STPU	3	625	Fixed	In	3	Pickup	1200				Out
B UPS-IN	GE	Spectra RMS	MCCB SF	250	250	LT Pickup	1		250	LT Delay	Fixed	ST Pickup	3	625	Fixed	In	3	Pickup	1200				Out
B LA-MCB	GE	Spectra RMS	MCCB SF	250	250	LT Pickup	1		250	LT Delay	Fixed	ST Pickup	5	475	Fixed	In	5	Pickup	975				Out
B LB-MAIN	GE	Spectra RMS	MCCB SF	250	125	LT Pickup	1		125	LT Delay	Fixed	ST Pickup	Max	625	Fixed	In	Max	Pickup	1250				Out
B LX-MAIN	GE	Spectra RMS	MCCB SF	250	125	LT Pickup	1		125	LT Delay	Fixed	ST Pickup	Max	625	Fixed	In	Max	Pickup	1250				Out
B TX TA	B TA-MAIN DISC	Spectra RMS	MCCB SF	250	225	LT Pickup	1		225	LT Delay	Fixed	ST Pickup	3	562.5	Fixed	In	3	Pickup	1080				Out
B TX TB	B TB-MAIN DISC	Spectra RMS	MCCB SF	250	125	LT Pickup	1		125	LT Delay	Fixed	ST Pickup	Max	625	Fixed	In	Max	Pickup	1250				Out
B TB-MAIN DISC	B TB-MAIN DISC	Spectra RMS	MCCB SF	250	225	LT Pickup	1		225	LT Delay	Fixed	ST Pickup	3	562.5	Fixed	In	3	Pickup	1080				Out
B TX TC	B TC-MAIN DISC	Spectra RMS	MCCB SE	250	70	LT Pickup	1		70	LT Delay	Fixed	ST Pickup	Max	350	Fixed	In	Max	Pickup	700				Out
B TC-MAIN DISC	B TC-MAIN DISC	Spectra RMS	MCCB SE	150A (150AT)	150	LT Pickup	1	1	150	LT Delay	Fixed	ST Pickup	3	367.5	Fixed	In	3	Pickup	705				Out
B TX TD	B TD-MAIN DISC	Spectra RMS	MCCB SF	250	70	LT Pickup	1	1	70	LT Delay	Fixed	ST Pickup	Max	350	Fixed	In	Max	Pickup	700				Out
B TD-MAIN DISC	B TD-MAIN DISC	Spectra RMS	MCCB SE	150A (150AT)	150	LT Pickup	1	1	150	LT Delay	Fixed	ST Pickup	4	450	Fixed	In	4	Pickup	885				Out
B 110A	GE	Spectra RMS	MCCB SF	250	110	LT Pickup	1		110	LT Delay	Fixed	ST Pickup	Max	550	Fixed	In	Max	Pickup	1100				Out
B 225A	GE	Spectra RMS	MCCB SF	250	225	LT Pickup	1		225	LT Delay	Fixed	ST Pickup	Max	1125	Fixed	In	Max	Pickup	2250				Out
B DIM-DISC	GE	Spectra RMS	MCCB SG	400	350	LT Pickup	1		350	LT Delay	Fixed	ST Pickup	4	1050	Fixed	In	4	Pickup	2100				Out

Verify all Rating Plugs in Breakers. Notify Engineer if rating plugs or electronic trip units vary from this Table

KTNV Broadcast Facility
Thermal Magnetic Breakers
4/30/2007 (Rev. 1)

Thermal Magnetic Breaker	Manufacturer	Type	Style	Frame	Trip	Instantaneous	
						Setting	Trip (A)
B TX LX	GE	Record Plus	FBN	100A (70AT)	70		
B 30A	GE	Record Plus	FCV	100A (30AT)	30		
B 50A	GE	Record Plus	FCV	100A (50AT)	50		
B 70A	GE	Record Plus	FCV	100A (70AT)	70		
B 100A	GE	Record Plus	FCV	100A (100AT)	100		
B DPU-BR	GE	Record Plus	FCV	100A (70AT)	70		
B HA-BR	GE	Record Plus	FBN	100A (20AT)	20		
B HA-BR2	GE	E150	THED (277V)	150A(15-30AT)	20		
B HB-BR	GE	E150	THED (277V)	150A(15-30AT)	20		
B HX-BR	GE	E150	THED (277V)	150A(15-30AT)	20		
B LA-BR	GE	Q Line	THQB-65kA	100A (15-50AT)	20		
B LB-BR	GE	Q Line	THQB-65kA	100A (15-50AT)	20		
B LX-BR	GE	Q Line	THQB-65kA	100A (15-50AT)	20		
B TA-BR	GE	Q Line	THQB-65kA	100A (15-50AT)	20		
B TB-BR	GE	Q Line	THQB-65kA	100A (15-50AT)	20		
B TC-BR	GE	Q Line	THQB-65kA	100A (15-50AT)	20		
B TDA	GE	Q Line	THQB-65kA	100A(60-100AT)	100		
B TD-BR	GE	Q Line	THQB-65kA	100A (15-50AT)	20		

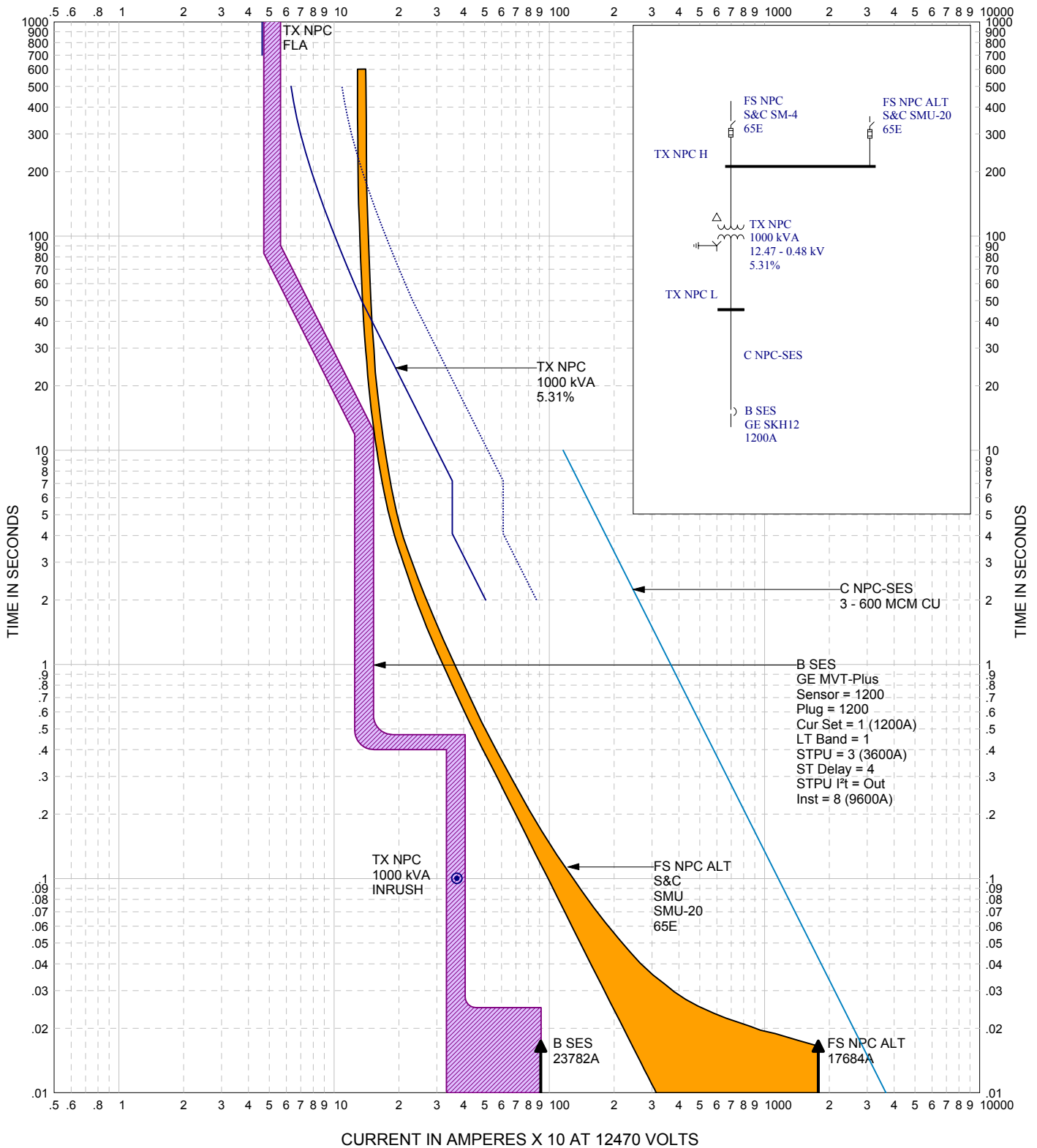
Fuses

KTNV Broadcast Facility
Fuses
4/30/2007 (Rev. 1)

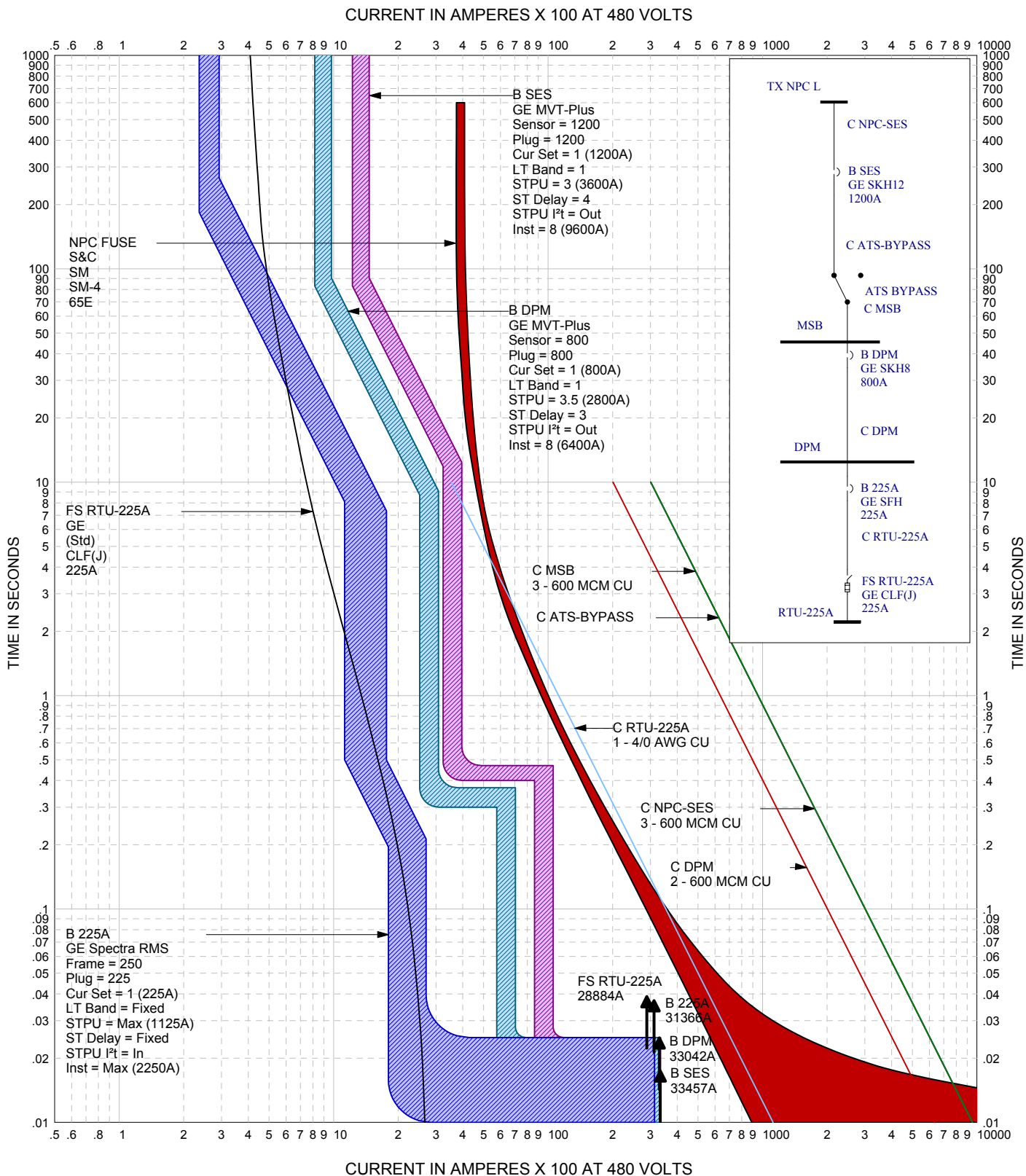
Existing / Installed Fuses	Manufacturer	Type	Style	Model	kV	Size
FS NPC	S&C	SM	SM-4	Std Speed	15.5	65E
FS NPC ALT	S&C	SMU	SMU-20	Standard Speed	15.5	65E
FS RTU-30A	GE	(Std)	CLF(J)		0.6	30A
FS RTU-50A	GE	(Std)	CLF(J)		0.6	50A
FS RTU-70A	GE	(Std)	CLF(J)		0.6	70A
FS RTU-100A	GE	(Std)	CLF(J)		0.6	100A
FS RTU-110A	GE	(Std)	CLF(J)		0.6	110A
FS RTU-225A	GE	(Std)	CLF(J)		0.6	225A

Time Current Curves

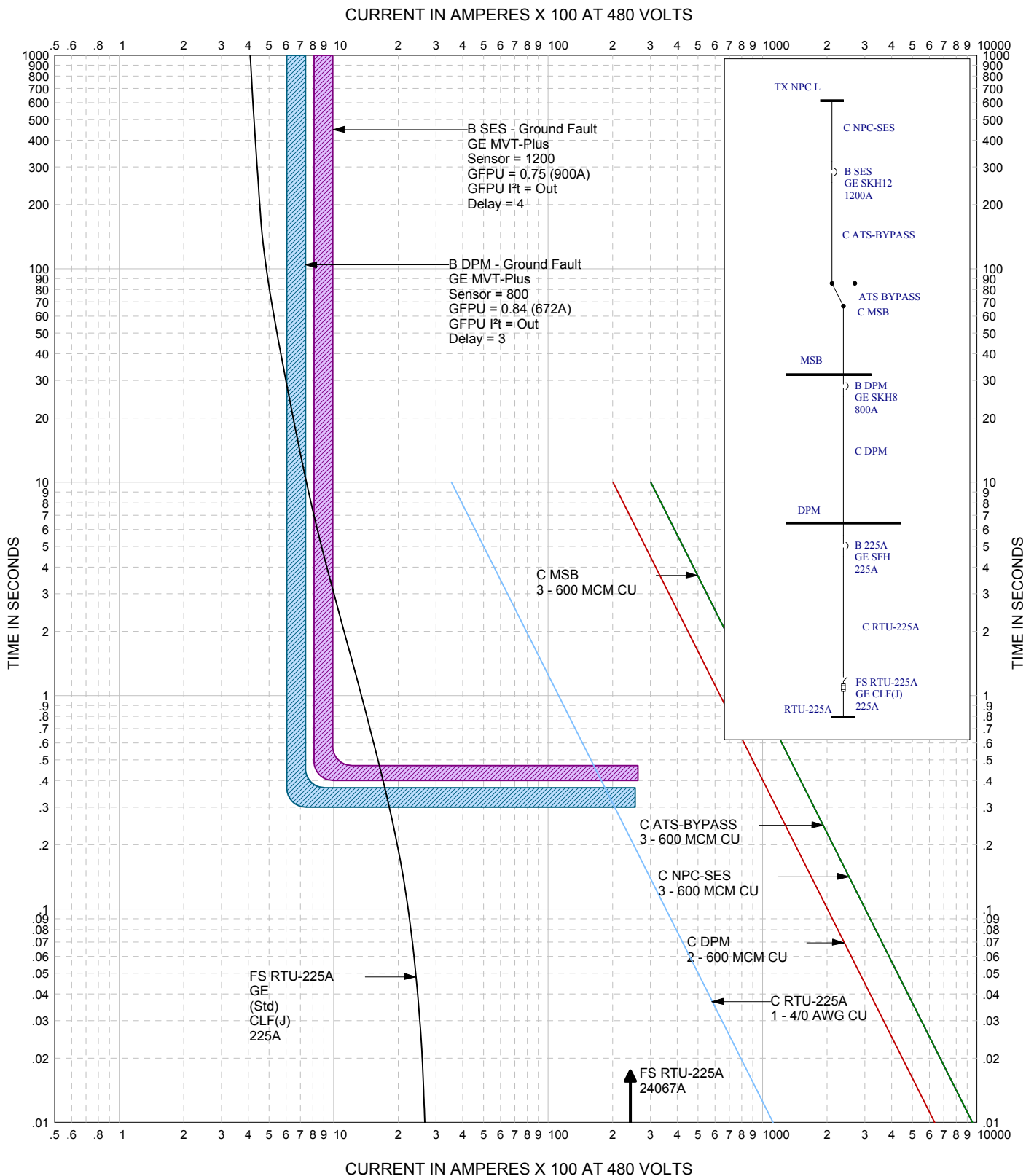
CURRENT IN AMPERES X 10 AT 12470 VOLTS



PQTSi	EasyPower [®] TIME-CURRENT CURVES	NPC - SES Main Alt
KTNV Broadcast Facility		FAULT: Phase
Nevada Power Primary Fuse: S&C SMU-20 65E		DATE: Apr 23, 2007
Breaker Settings: Service Entrance Main		BY: Joe Dietrich
		REVISION: 1

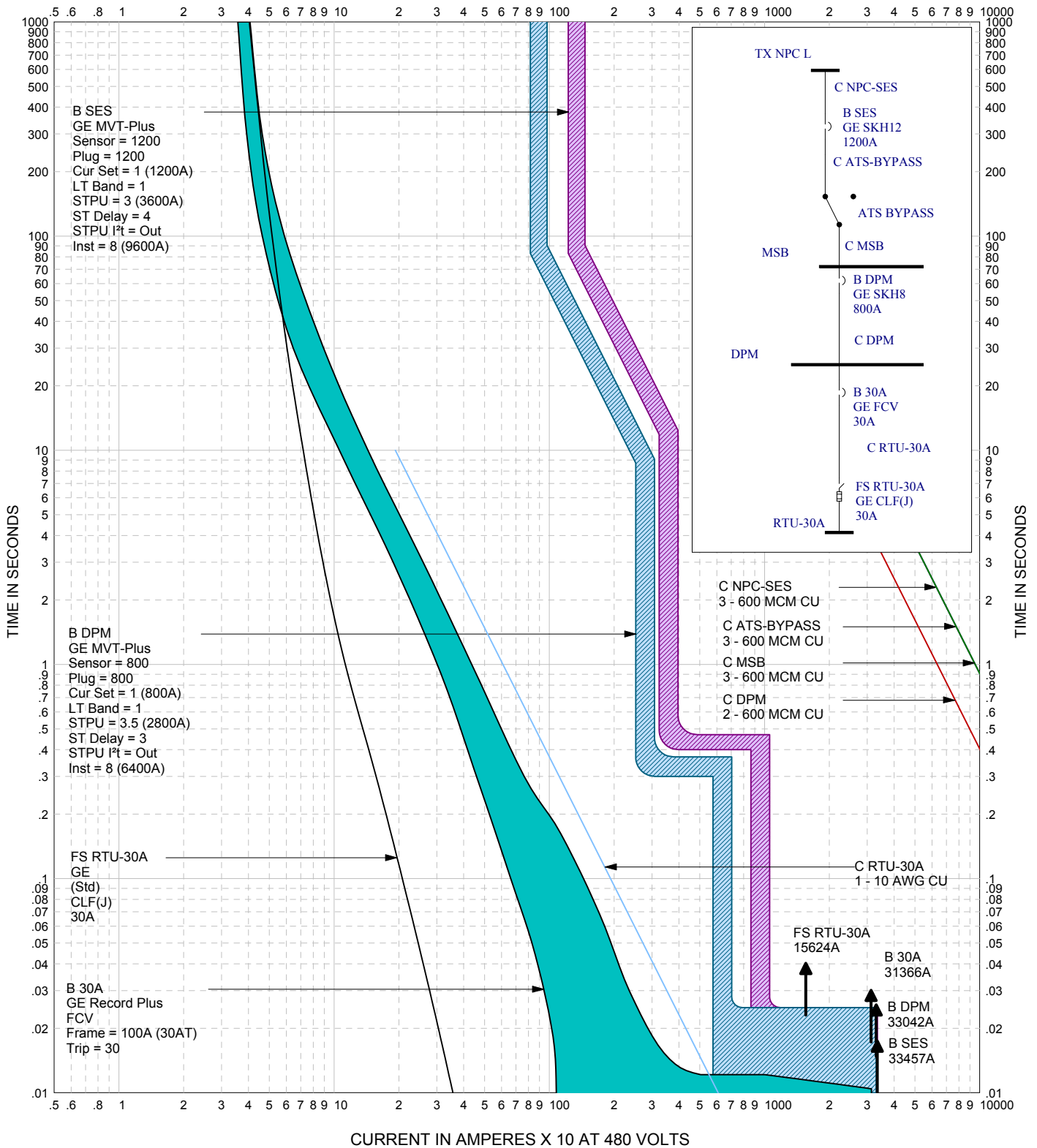


PQTSi	EasyPower® TIME-CURRENT CURVES	NPC MSA to RTU 225A
KTNV Broadcast Facility Nevada Power Primary Fuse: SM-4 65E Std Speed (per NPC Sys Prot) Breaker Settings: SES Main Service, Feeder DPM, Feeder RTU-225A		FAULT: Phase DATE: April 23, 2007 BY: Joe Dietrich REVISION: 1

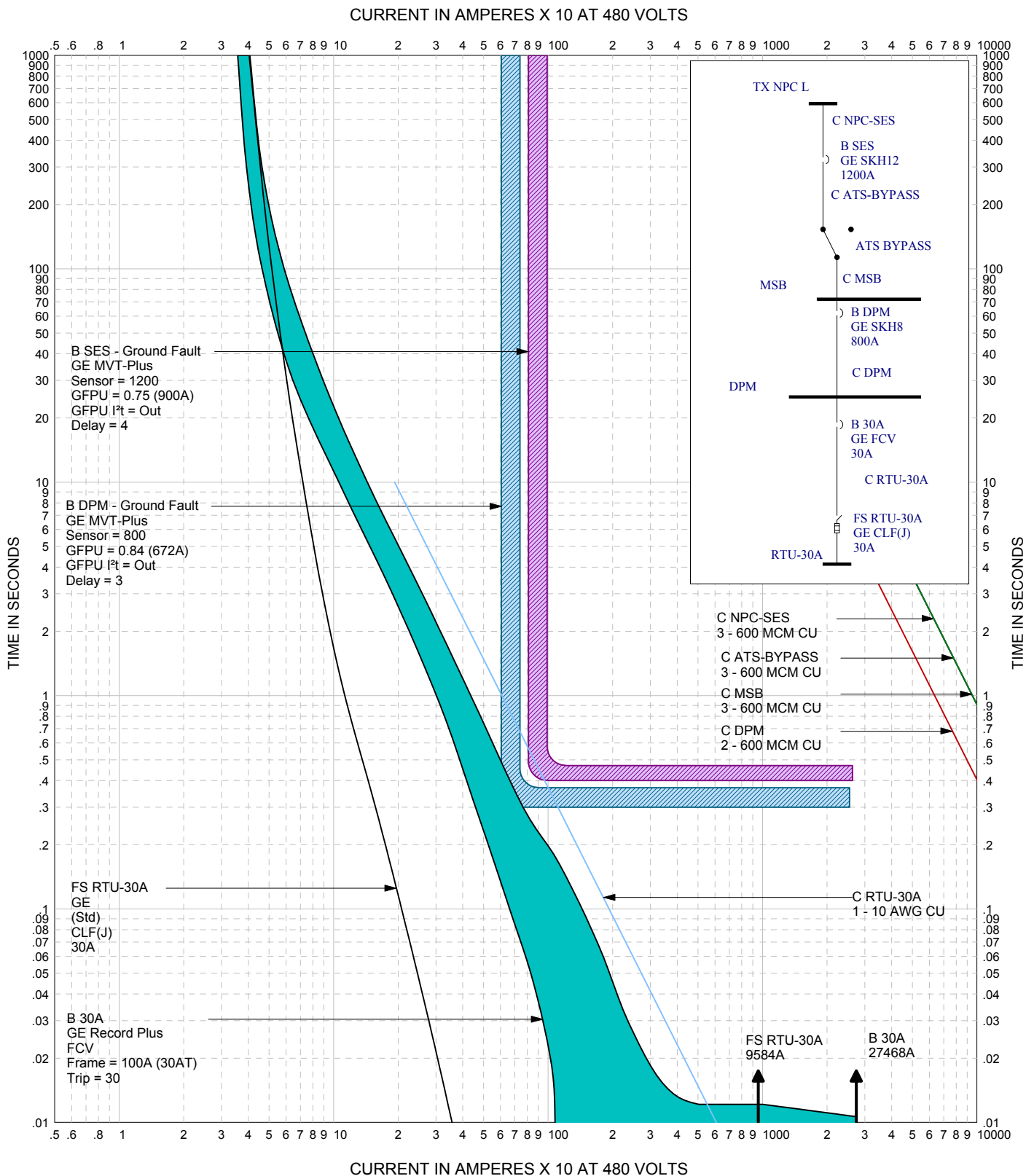


PQTSi	EasyPower[®] TIME-CURRENT CURVES	NPC MSA to RTU 225A
KTNV Breaker Settings: SES Main Service, Feeder DPM, Feeder RTU-225A		FAULT: Ground DATE: April 30, 2007 BY: Joe Dietrich REVISION: 1

CURRENT IN AMPERES X 10 AT 480 VOLTS

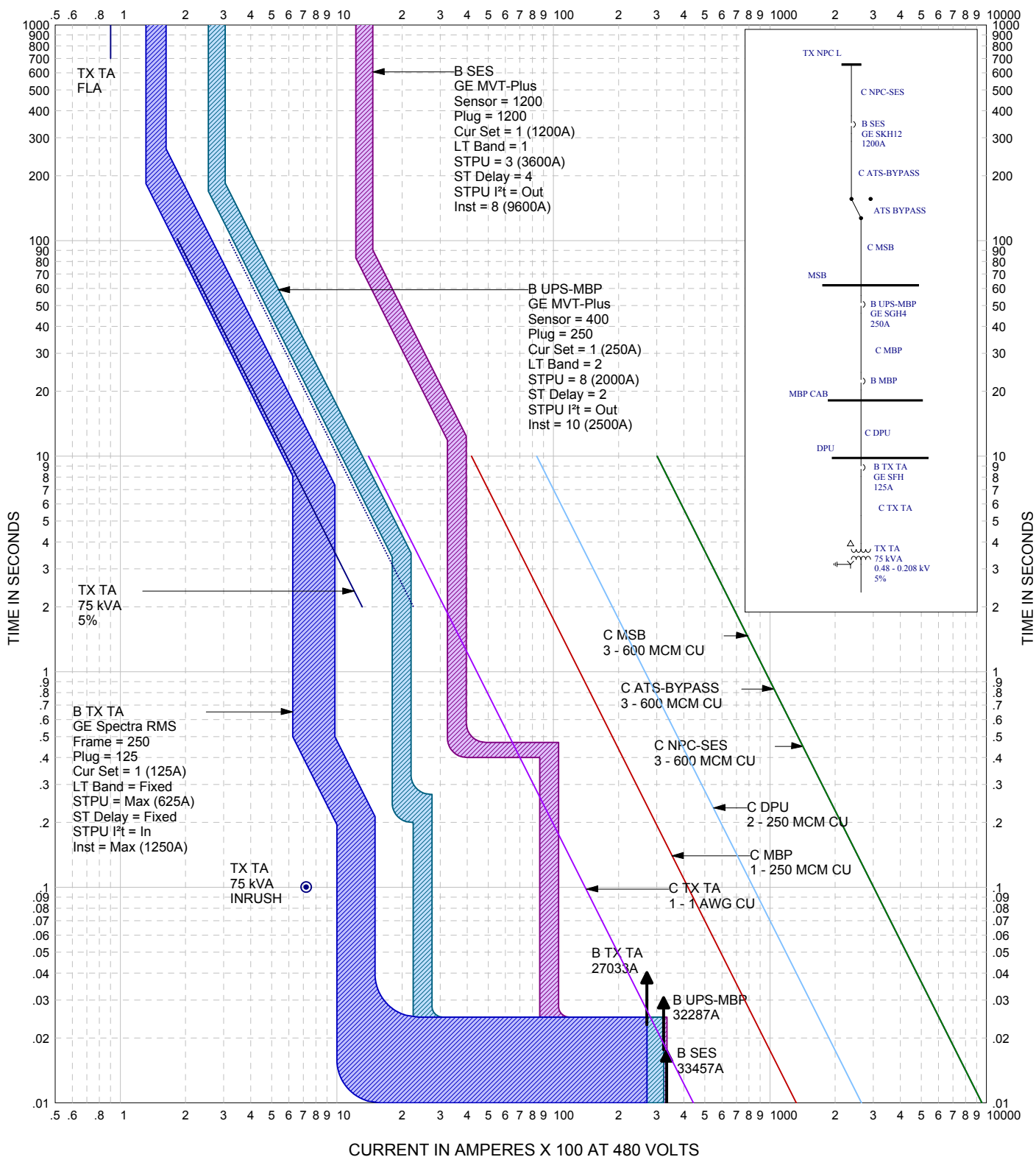


PQTSi	EasyPower® TIME-CURRENT CURVES	SES to RTU-30A
KTNV Broadcast Facility Breaker Settings: SES Main Service, Feeder DPM, Feeder 30A RTU		FAULT: Phase DATE: Apr 30, 2007 BY: Joe Dietrich REVISION: 1



PQTSi	EasyPower® TIME-CURRENT CURVES	SES to RTU-30A
KTNV Broadcast Facility Breaker Settings: SES Main Service, Feeder DPM, Feeder 30A RTU		FAULT: GROUND DATE: Apr 30, 2007 BY: Joe Dietrich REVISION: 1

CURRENT IN AMPERES X 100 AT 480 VOLTS



PQTSi

EasyPower® TIME-CURRENT CURVES

NPC MSA to Tx TA

KTNV

Breaker Settings: SES Main Service, Feeder UPS-MBP (Maint. Bypass),

Feeder Tx TA

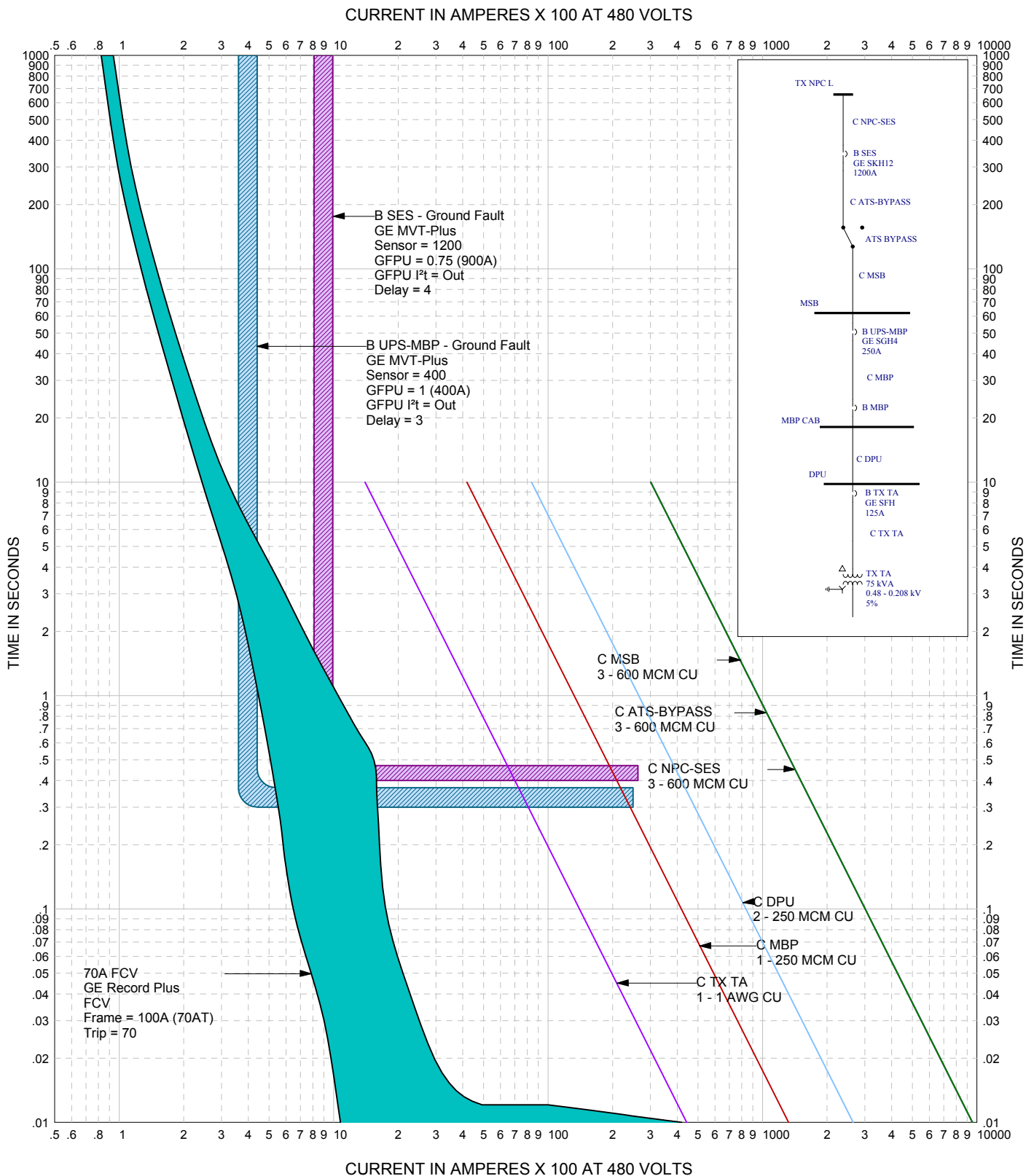
UPS breakers- No information provided

FAULT: Phase

DATE: Jan 24, 2007

BY: Joe Dietrich

REVISION: 0



PQTSi

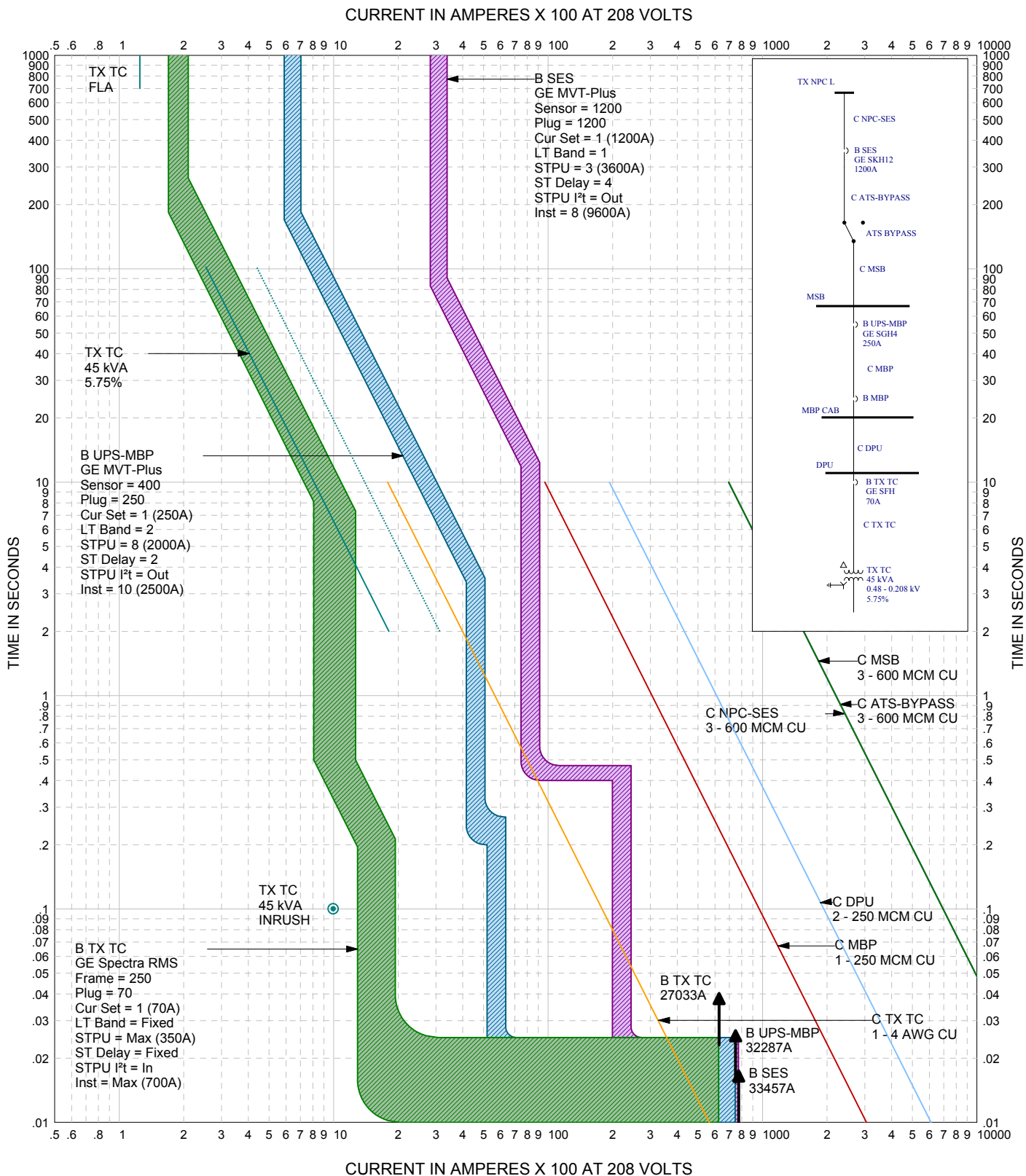
EasyPower®
TIME-CURRENT CURVES

NPC MSA to Tx TA

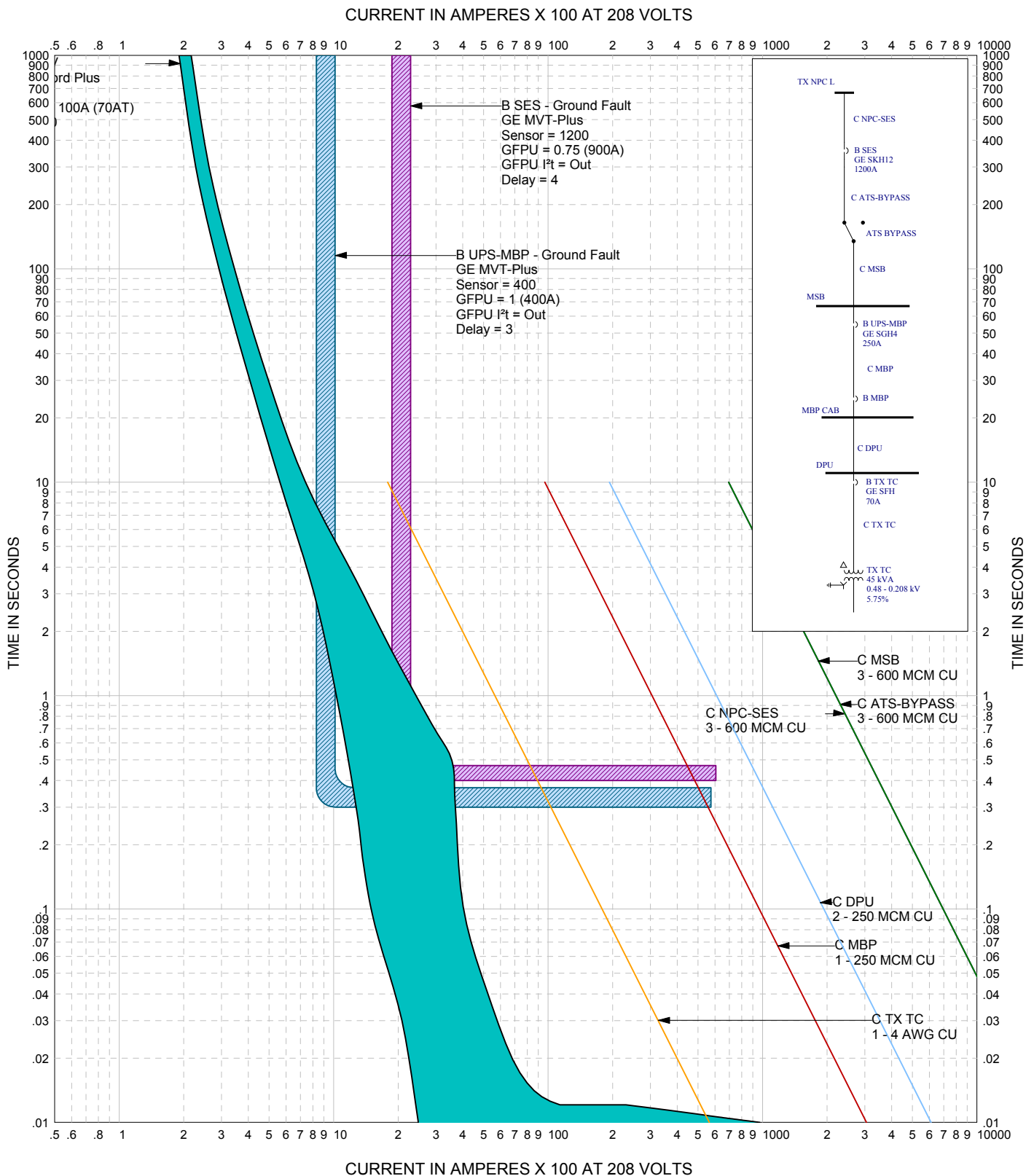
KTNV

Breaker Settings: SES Main Service, Feeder UPS-MBP (Maint. Bypass),
Feeder Tx TA, 70A Feeder on DPU (FCV)
UPS breakers- No information provided

FAULT: Ground
DATE: April 30, 2007
BY: Joe Dietrich
REVISION: 1

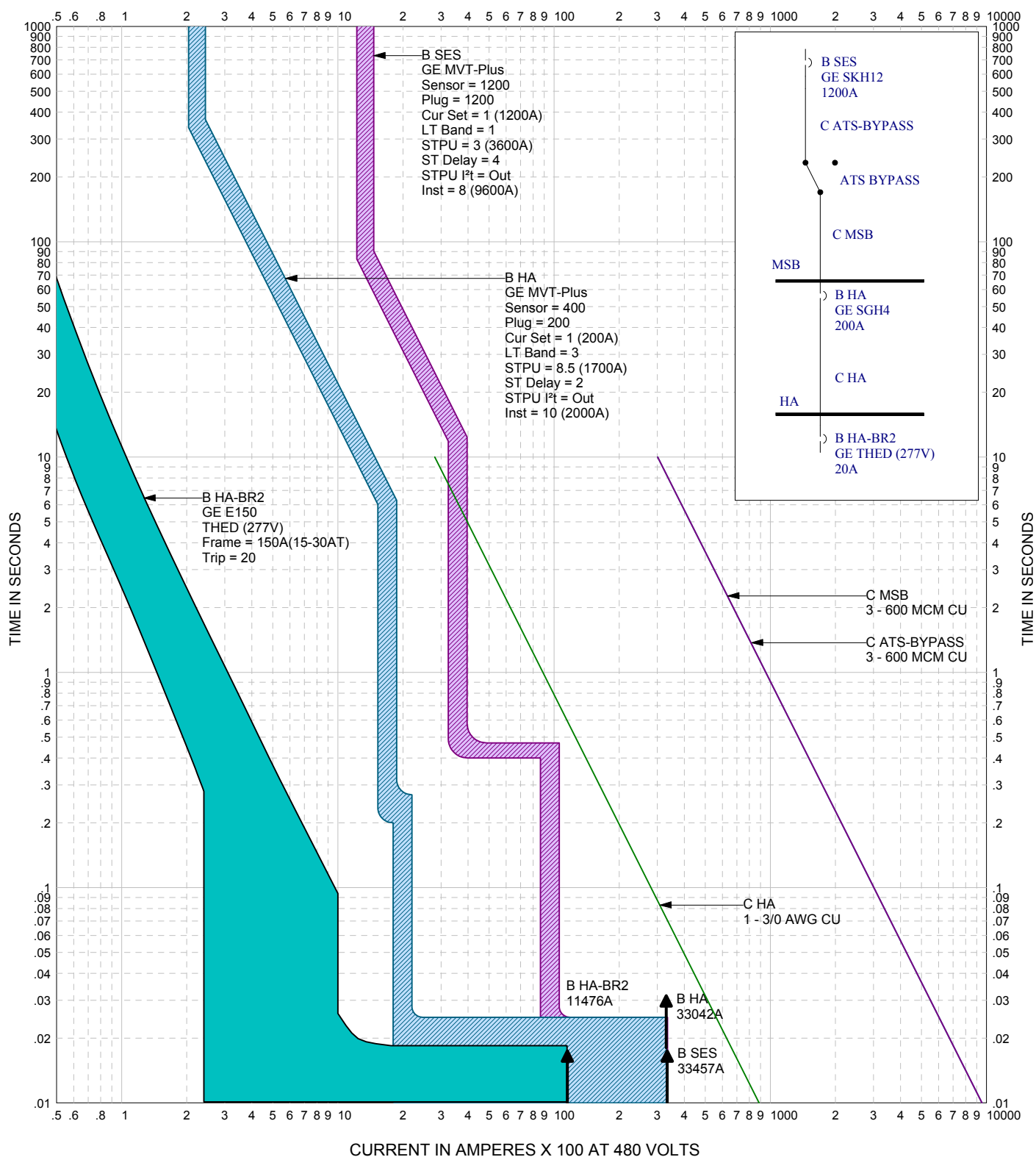


PQTSi	EasyPower® TIME-CURRENT CURVES	NPC MSA to Tx TC
KTNV Breaker Settings: SES Main Service, Feeder UPS-MBP (Maint. Bypass), Feeder Tx TC UPS breakers- No information provided		FAULT: Phase DATE: Jan 24, 2007 BY: Joe Dietrich REVISION: 0



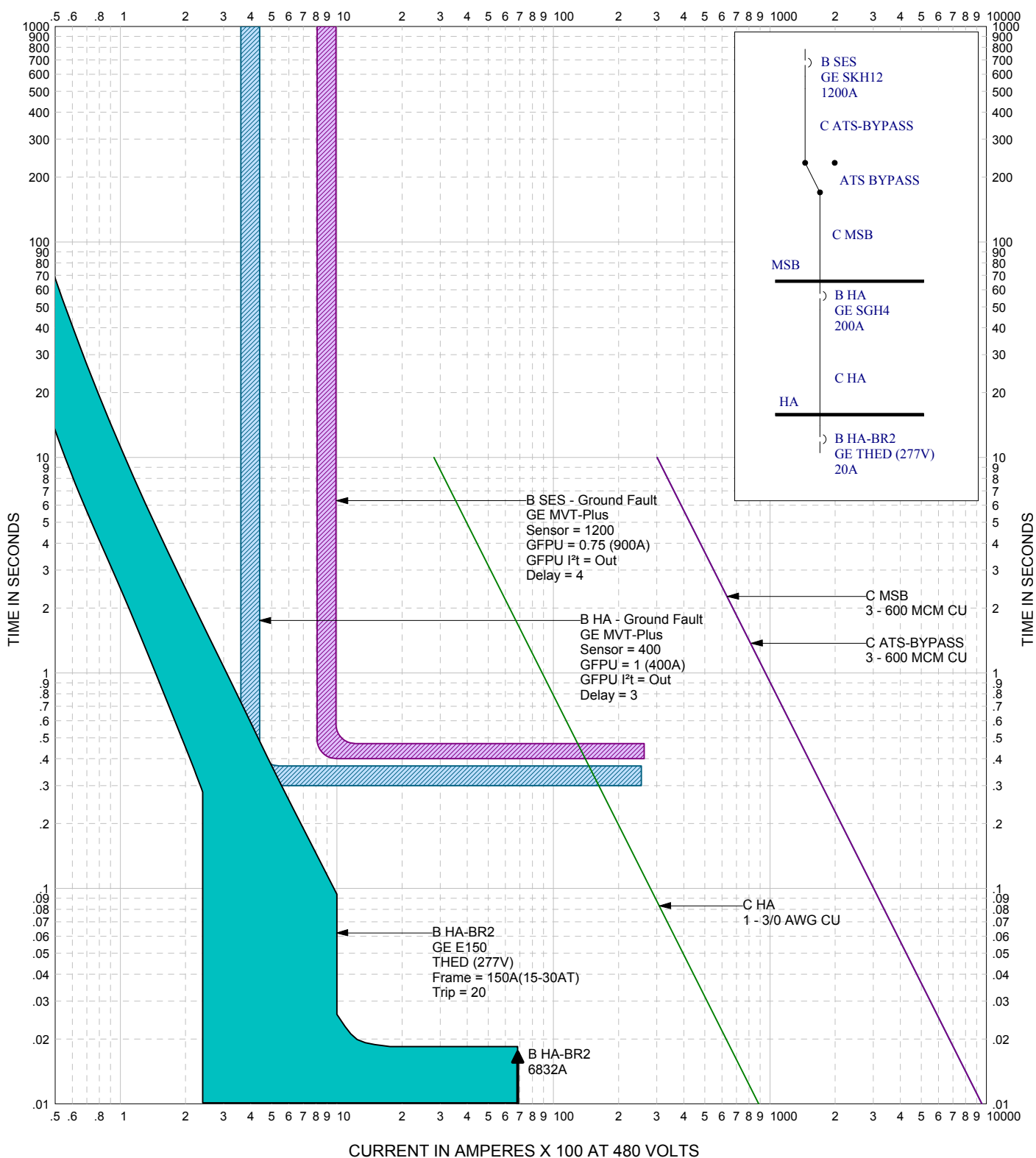
PQTSi	EasyPower® TIME-CURRENT CURVES	NPC MSA to Tx TC
KTNV Breaker Settings: SES Main Service, Feeder UPS-MBP (Maint. Bypass), Feeder Tx TC, DPU Feeder 70A (FCV) UPS breakers- No information provided		FAULT: Ground DATE: April 30, 2007 BY: Joe Dietrich REVISION: 1

CURRENT IN AMPERES X 100 AT 480 VOLTS



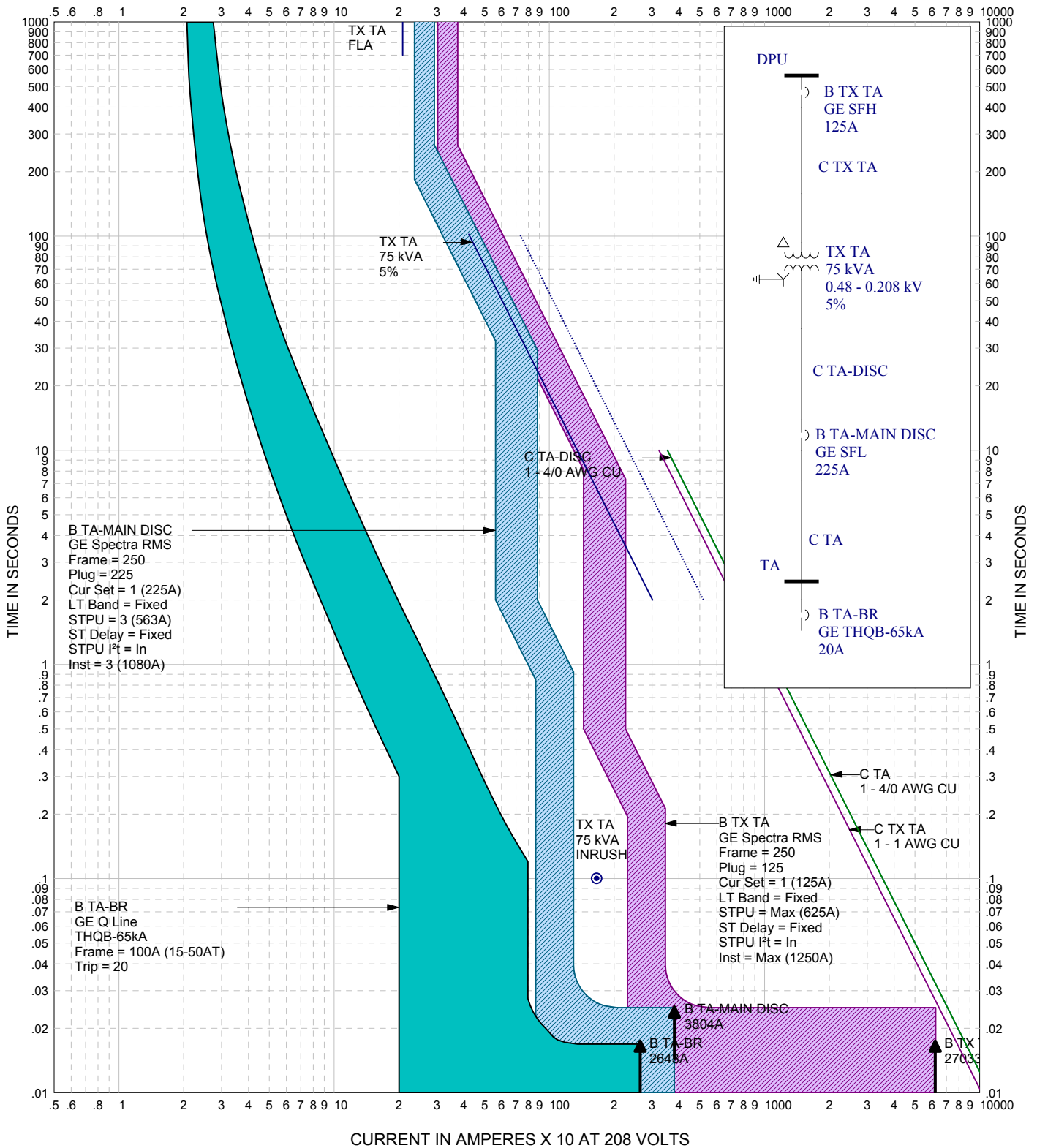
PQTSi	EasyPower[®] TIME-CURRENT CURVES	SES-Main HA branch Ph
KTNV Broadcast Facility		FAULT: Phase
Breaker Settings:		DATE: Apr 23, 2007
		BY: Joe Dietrich
		REVISION: 0

CURRENT IN AMPERES X 100 AT 480 VOLTS



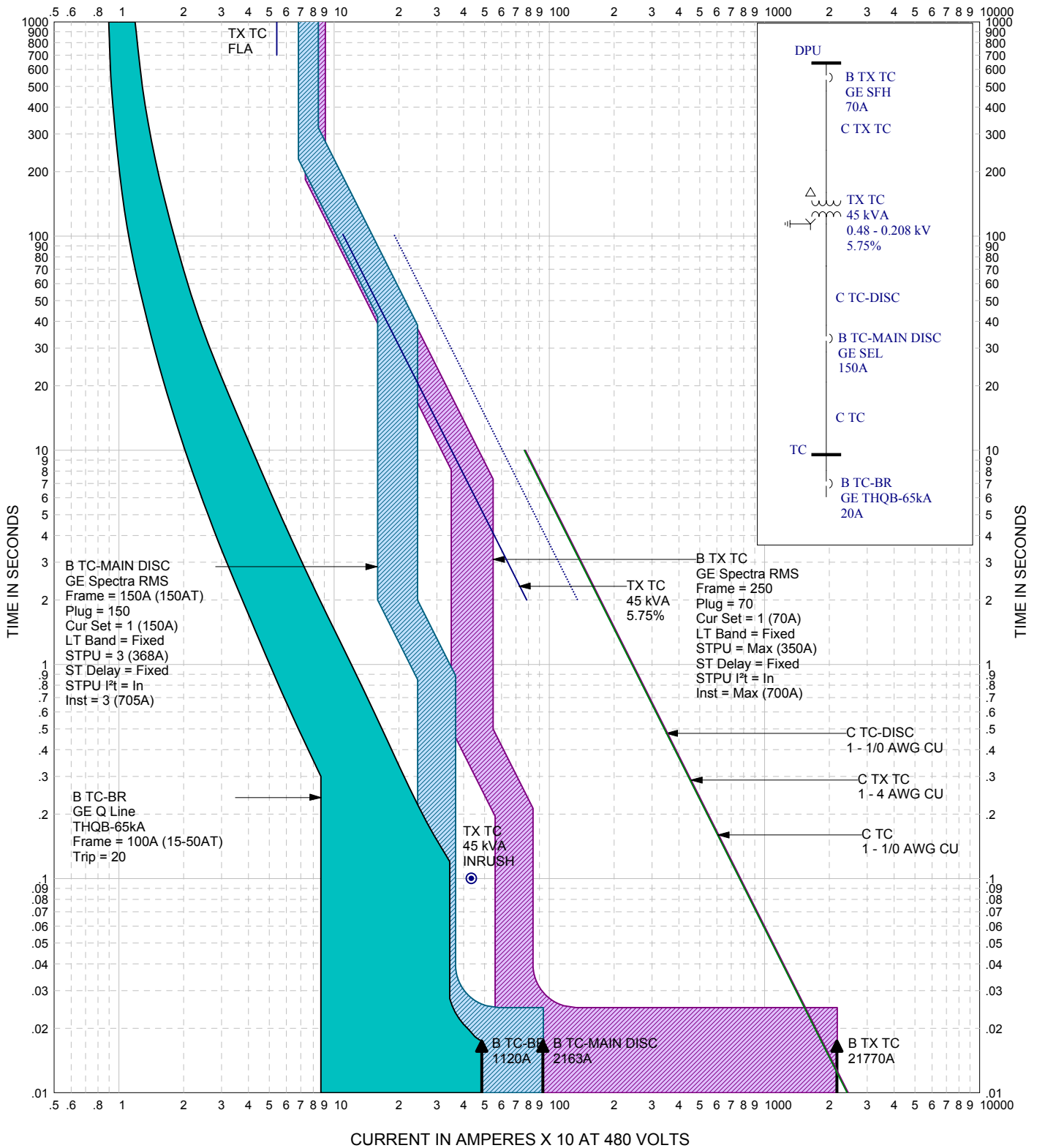
PQTSi	EasyPower® TIME-CURRENT CURVES	SES-Main to HA Branch GF
KTNV Broadcast Facility Breaker Settings:		FAULT: Ground DATE: Apr 23, 2007 BY: Joe Dietrich REVISION: 0

CURRENT IN AMPERES X 10 AT 208 VOLTS



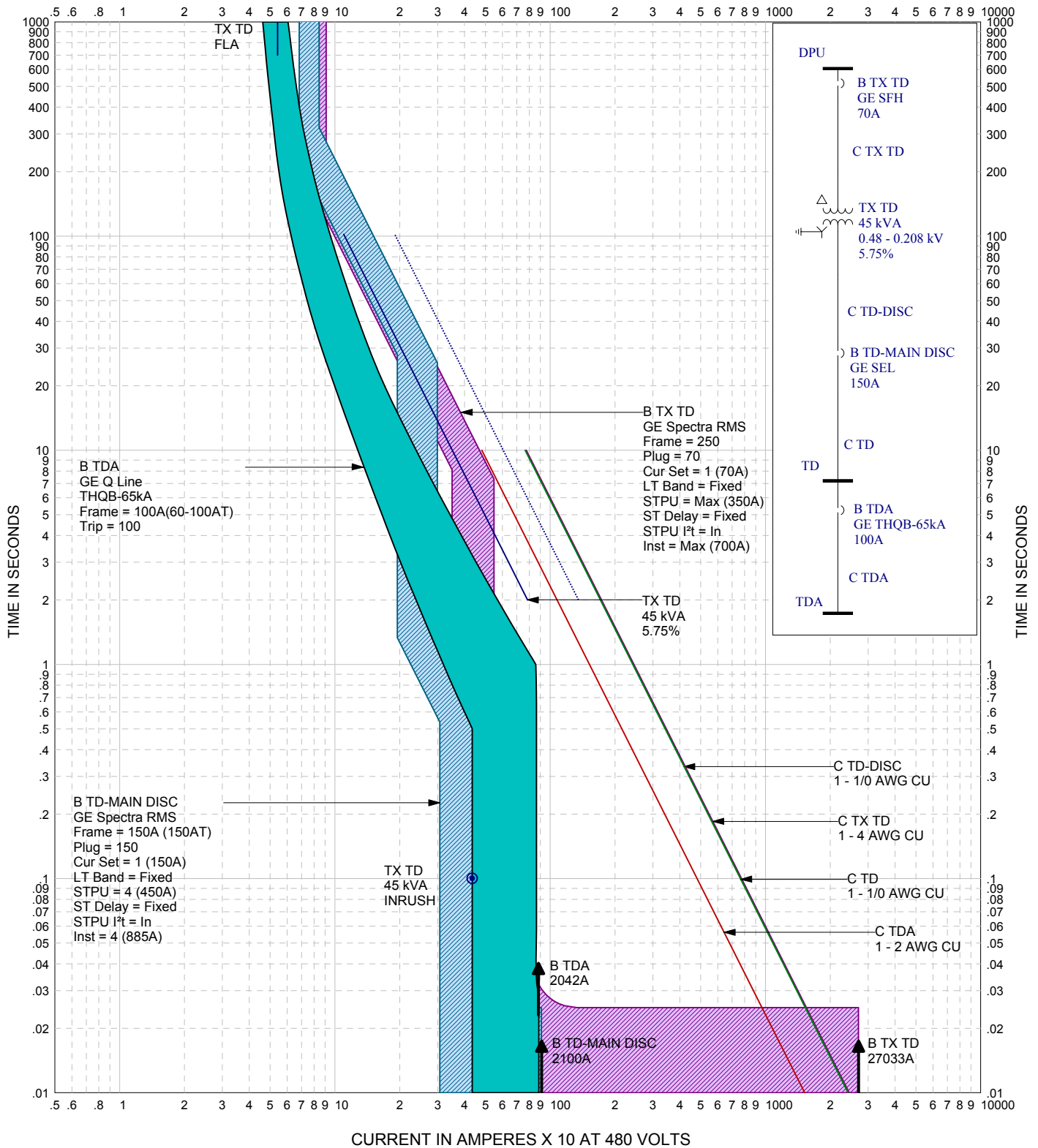
PQTSi	EasyPower® TIME-CURRENT CURVES	Tx TA
KTNV		FAULT: Phase
Breaker Settings: Feeder Tx TA (480V), TA Main Disc, TA-Branch (typical Tx TB)		DATE: Jan 24, 2007
		BY: Joe Dietrich
		REVISION: 0

CURRENT IN AMPERES X 10 AT 480 VOLTS



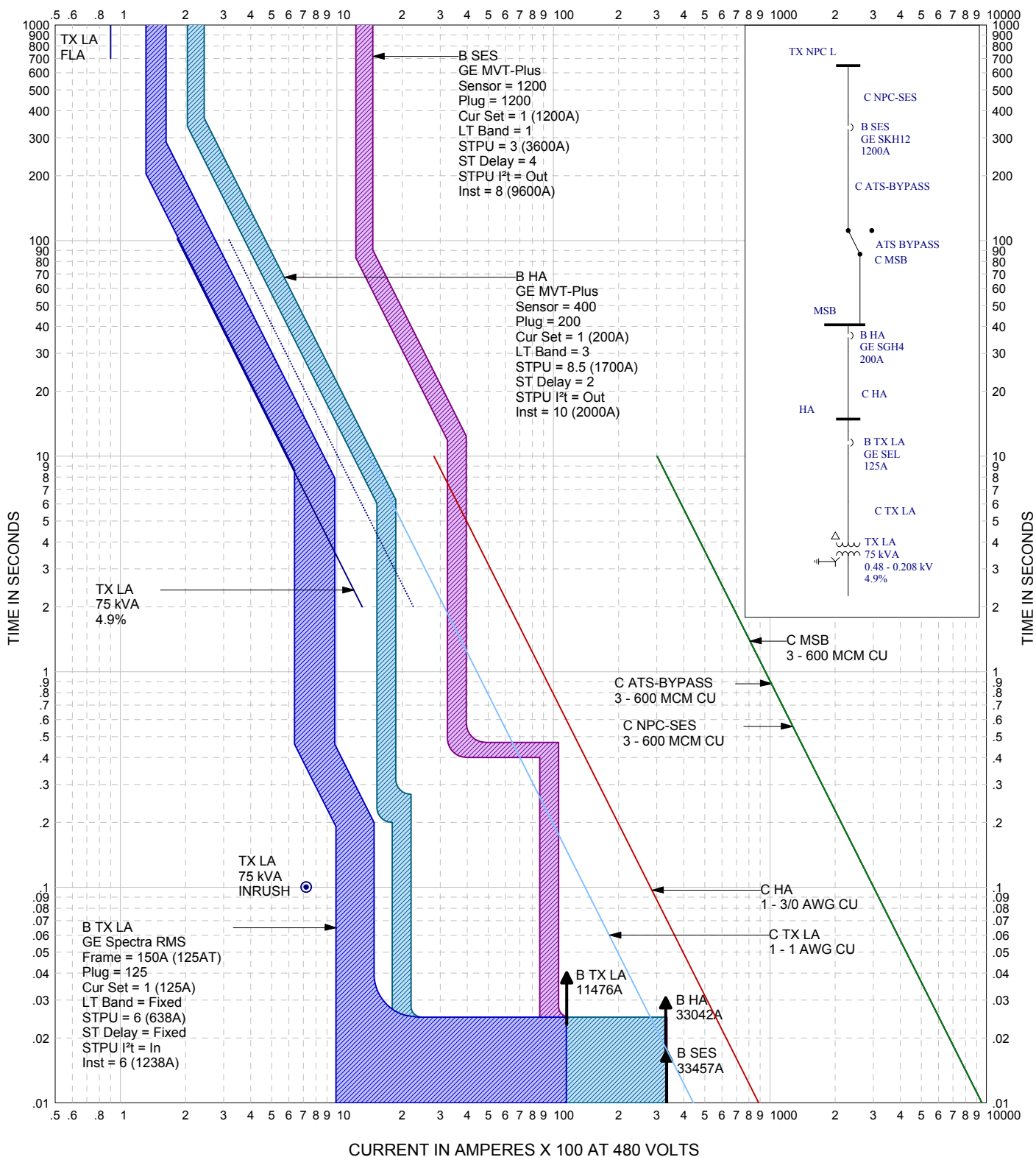
PQTSi	EasyPower® TIME-CURRENT CURVES	Tx TC
KTNV		FAULT: Phase
Breaker Settings: Feeder Tx TC (480V), TC-Main Disc, TC-Branch		DATE: Jan 29, 2007
		BY: Joe Dietrich
		REVISION: 0

CURRENT IN AMPERES X 10 AT 480 VOLTS



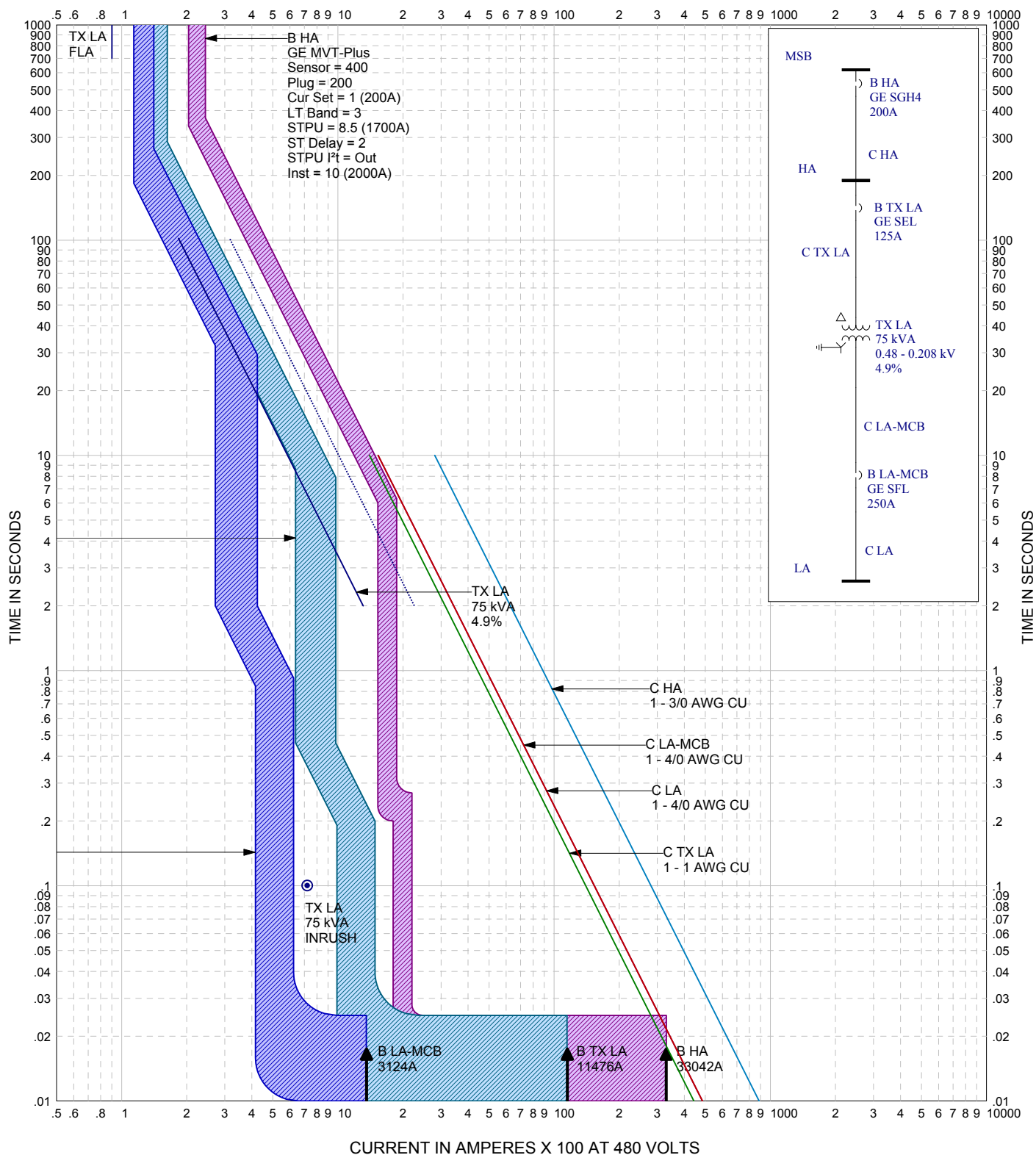
PQTSi	EasyPower® TIME-CURRENT CURVES	TX TD
KTNV		FAULT: Phase
Breaker Settings: Feeder Tx TD (480V), TD-Main Disc, Feeder TDA		DATE: Jan 24, 2007
Overlap of several breakers - some "racing" is expected		BY: Joe Dietrich
		REVISION: 0

CURRENT IN AMPERES X 100 AT 480 VOLTS

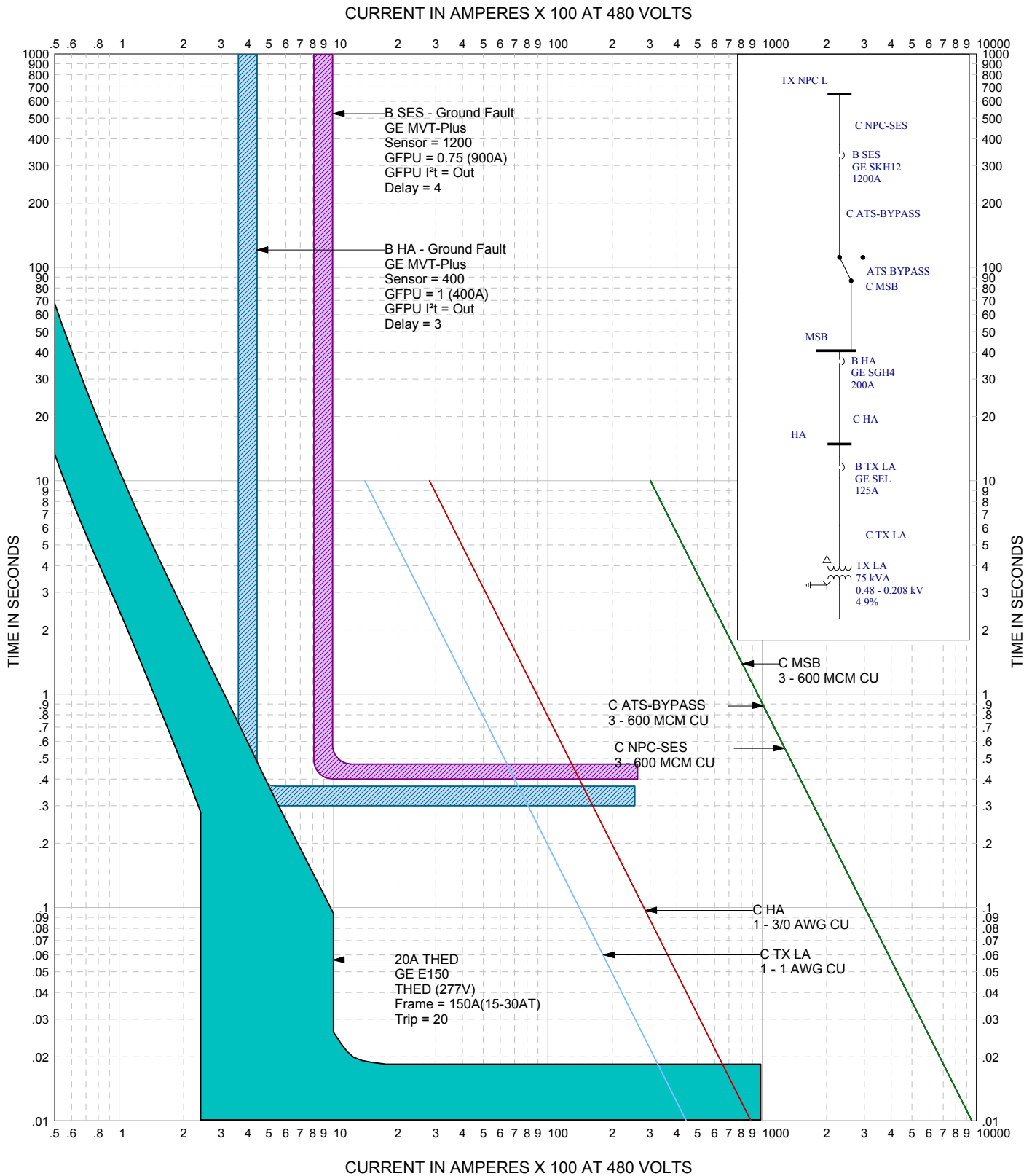


PQTSi	EasyPower [®] TIME-CURRENT CURVES	Tx LA
KTNV		FAULT: Phase
Breaker Settings: SES Main Service Disconnect, Feeder HA, Feeder TX LA		DATE: Jan 24, 2007
		BY: Joe Dietrich
		REVISION: 0

CURRENT IN AMPERES X 100 AT 480 VOLTS

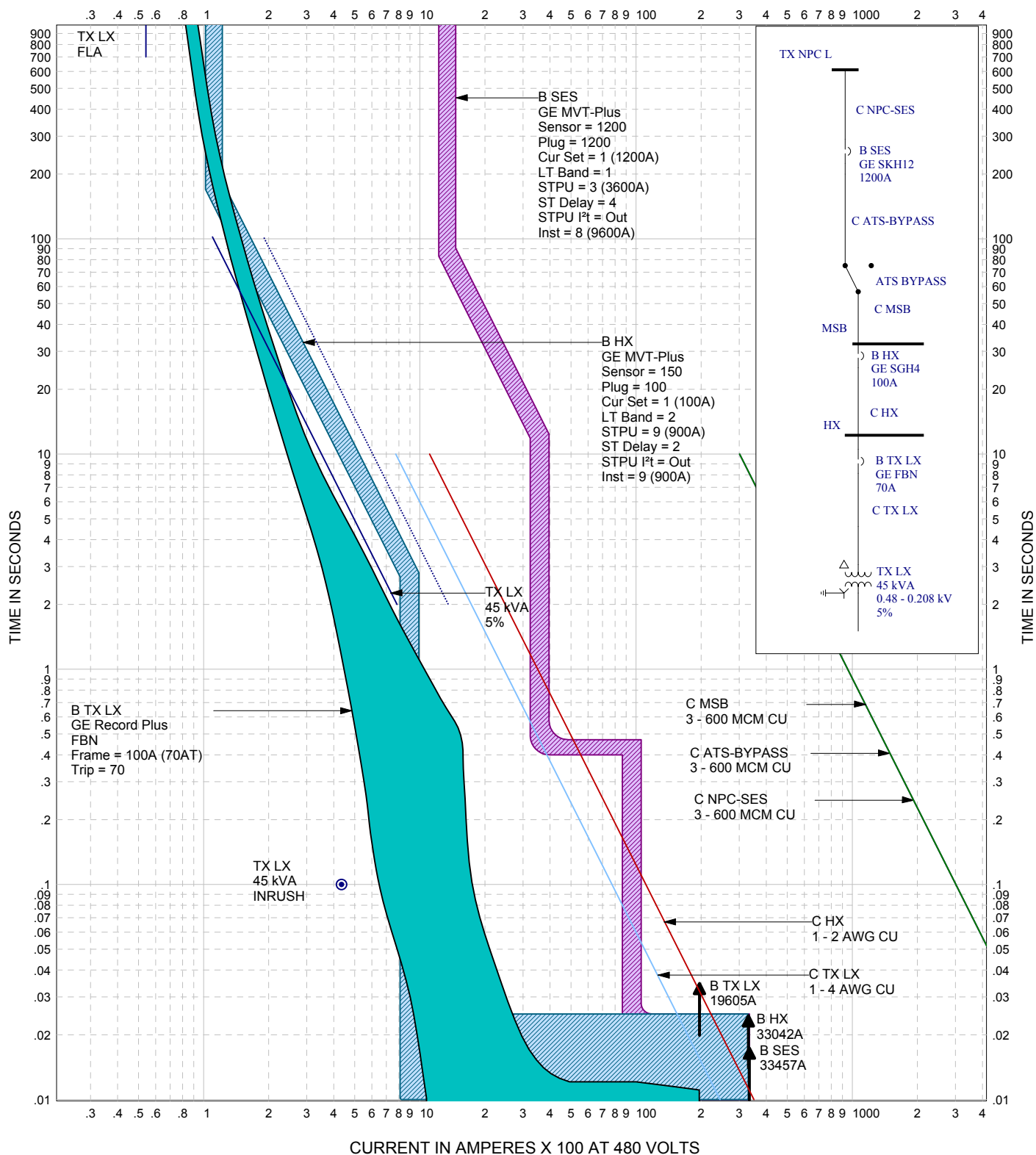


PQTSi	EasyPower® TIME-CURRENT CURVES	TX LA
KTNV		FAULT: Phase
Breaker Settings: Feeder HA, Feeder Tx LA, LA-MCB Main		DATE: Jan 29, 2007
		BY: Joe Dietrich
		REVISION: 0



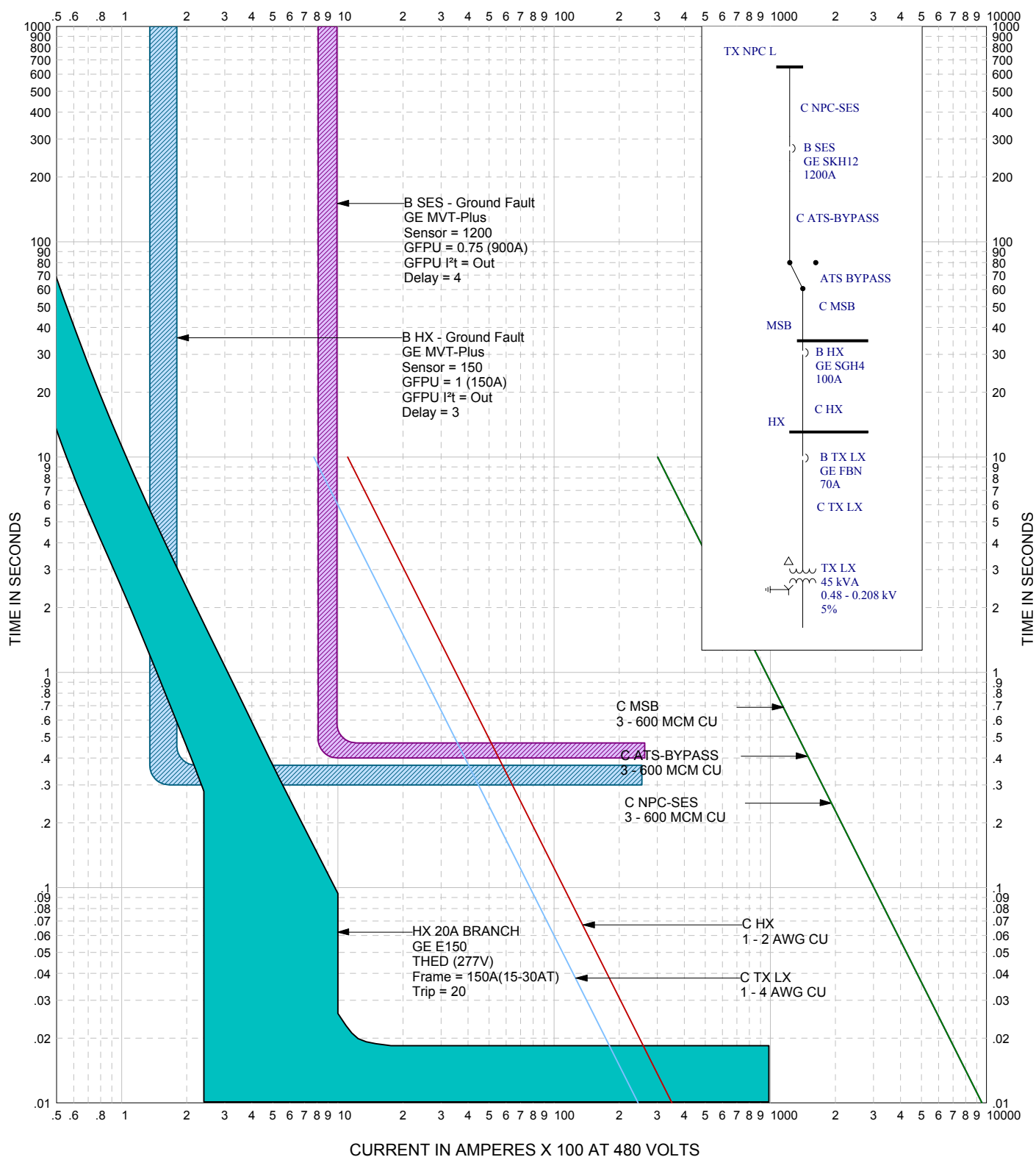
PQTSi	EasyPower[®] TIME-CURRENT CURVES	Tx LA
KTNV		FAULT: Ground
Breaker Settings: SES-Main Service Disc, Feeder HA, Feeder Tx LA, and HA 20A Feeder (THED)		DATE: April 30, 2007
		BY: Joe Dietrich
		REVISION: 1

CURRENT IN AMPERES X 100 AT 480 VOLTS



PQTSi	EasyPower [®] TIME-CURRENT CURVES	Tx HX
KTNV		FAULT: Phase
Breaker Settings: SES-Main Disc, Feeder HX, Feeder Tx LX		DATE: Jan 24, 2007
		BY: Joe Dietrich
		REVISION: 0

CURRENT IN AMPERES X 100 AT 480 VOLTS



PQTSi

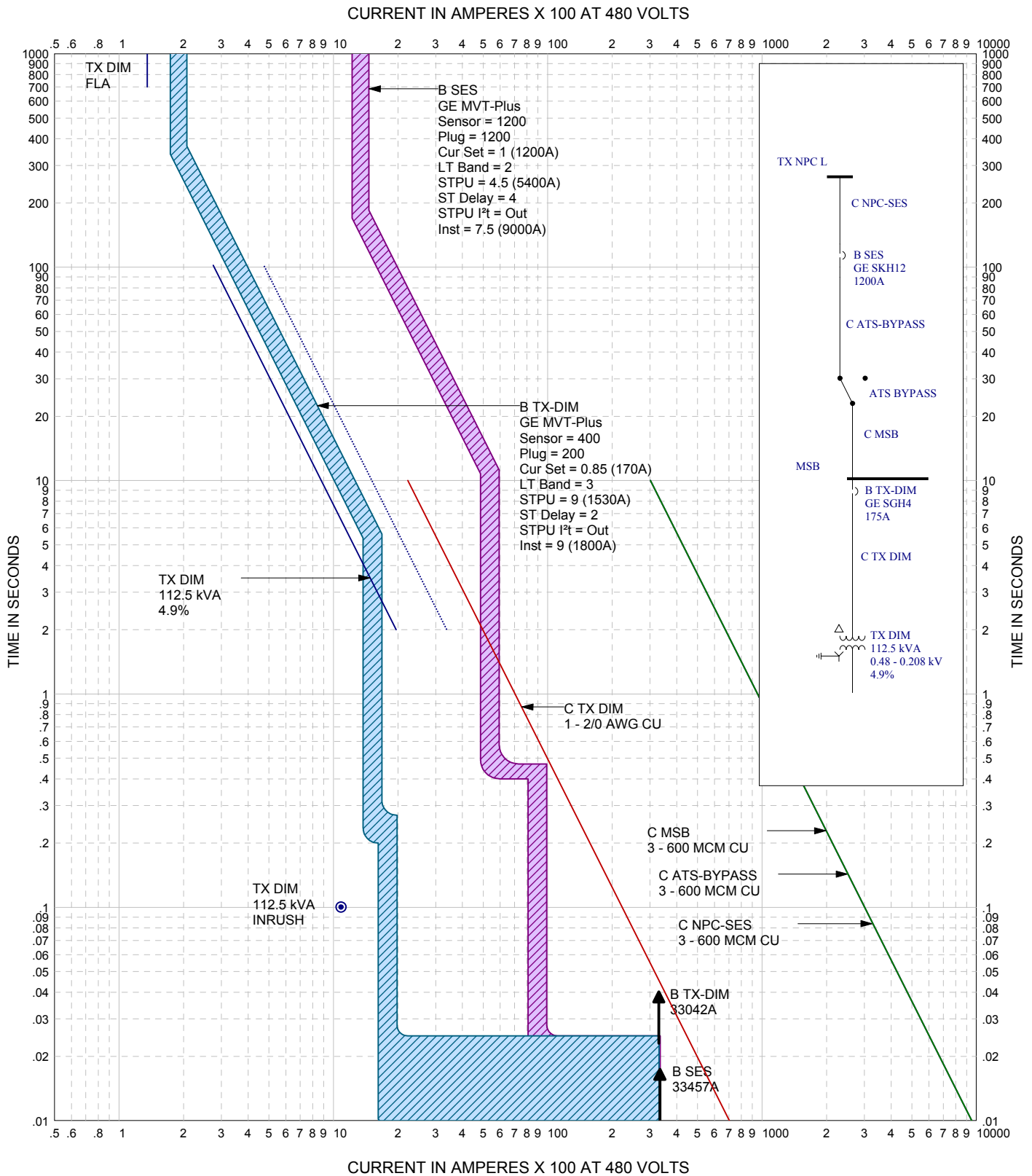
EasyPower®
TIME-CURRENT CURVES

Tx HX

KTNV

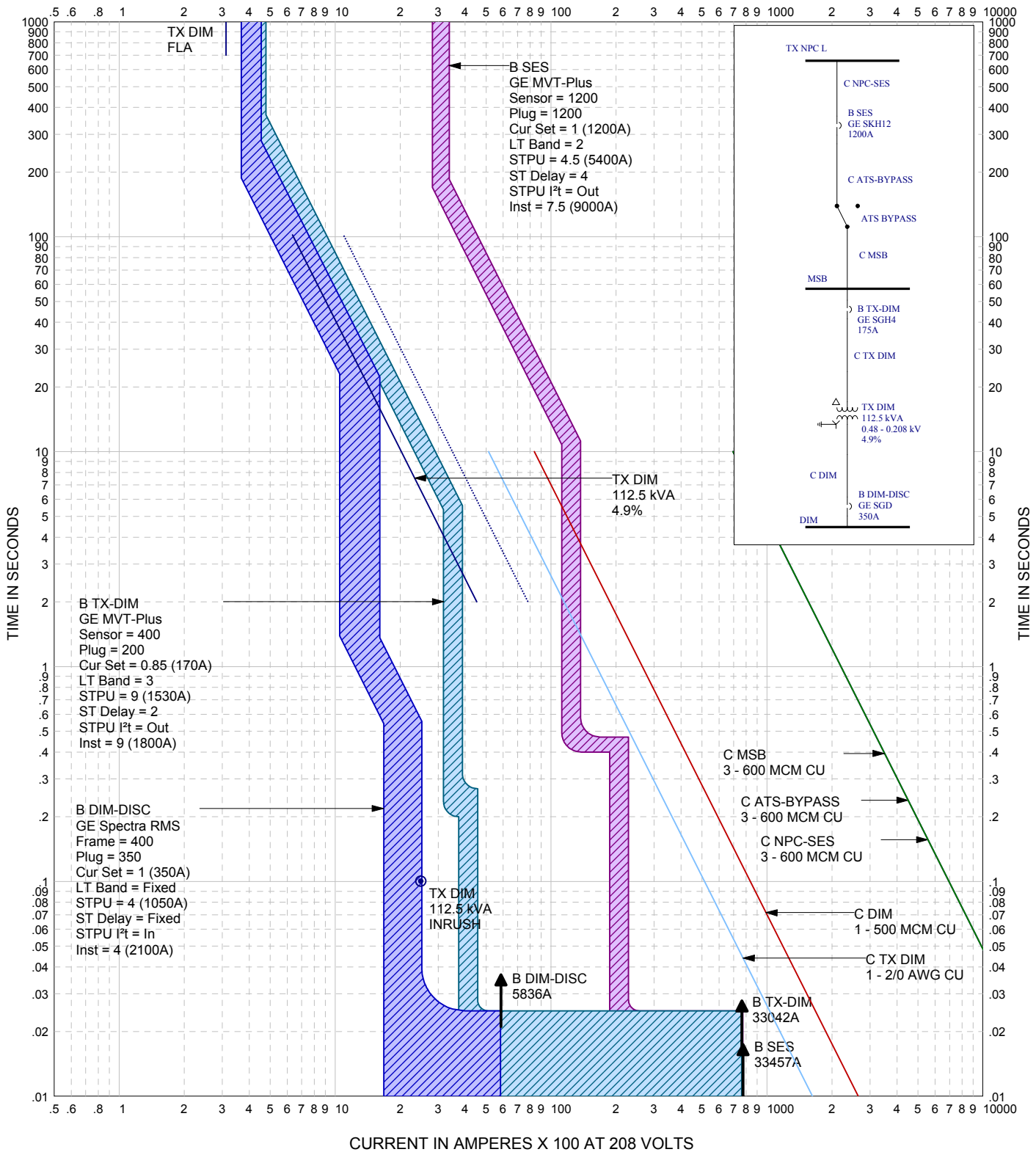
Breaker Settings: SES-Main Disc, Feeder HX

FAULT: Ground
DATE: Jan 24, 2007
BY: Joe Dietrich
REVISION: 0

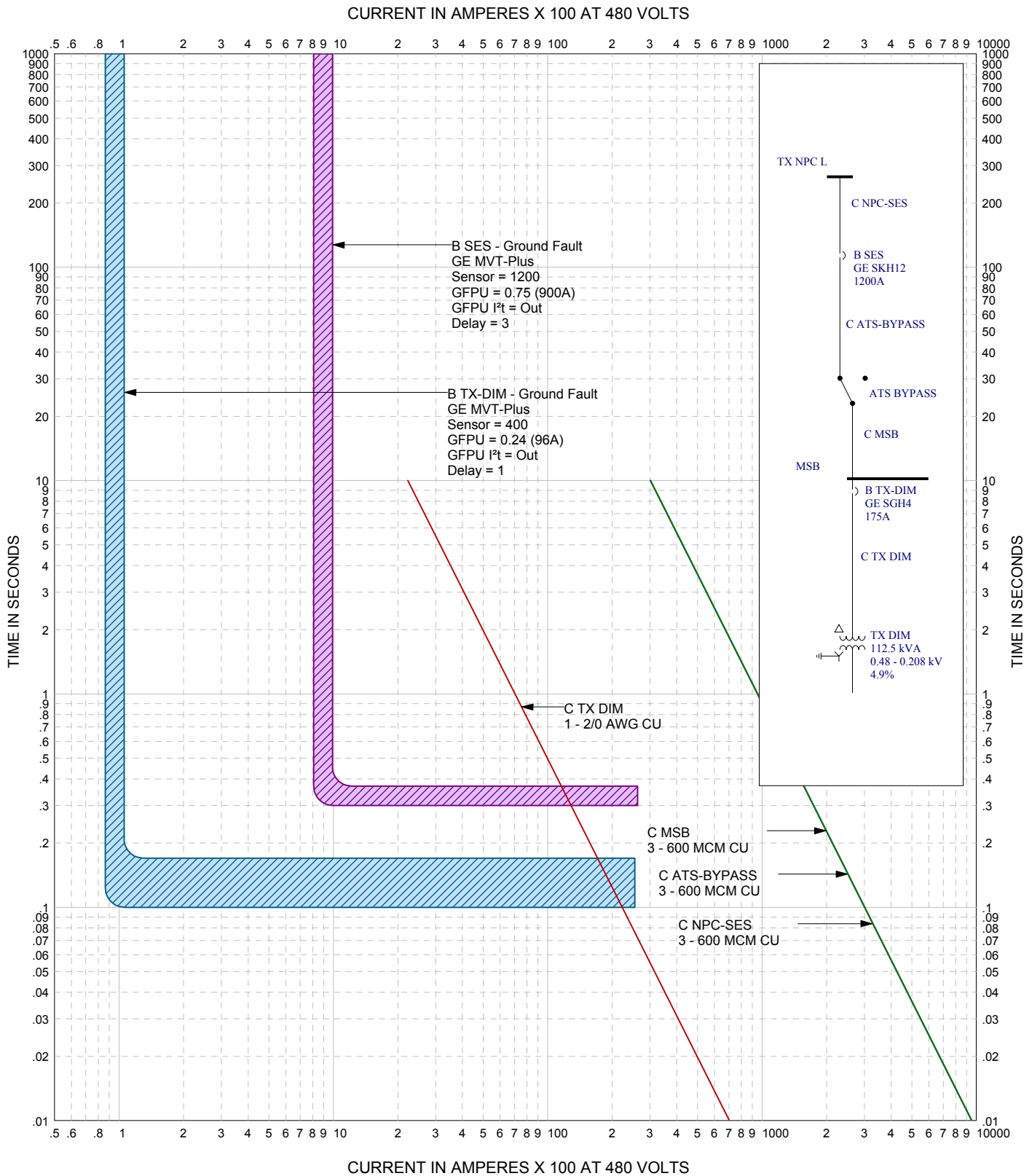


PQTSi	EasyPower® TIME-CURRENT CURVES	Tx DIM
KTNV		FAULT: Phase
Breaker Settings: SES-Main Disc, Feeder TX Dim		DATE: Jan 24, 2007
		BY: Joe Dietrich
		REVISION: 0

CURRENT IN AMPERES X 100 AT 208 VOLTS

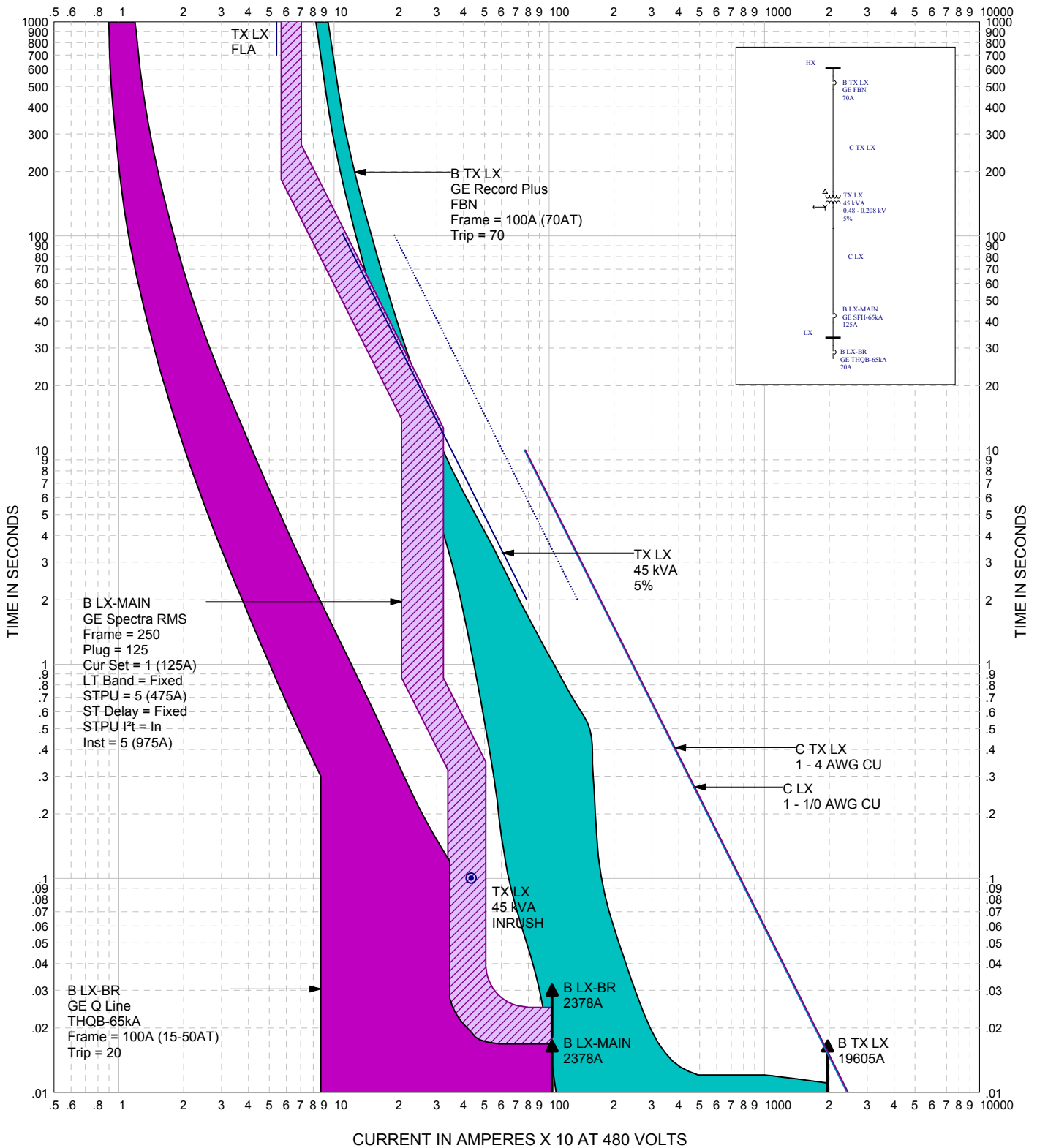


PQTSi	EasyPower® TIME-CURRENT CURVES	Tx DIM
KTNV		FAULT: Phase
Breaker Settings: SES-Main Disc, Feeder Tx-DIM, DIM Disc Main		DATE: Jan 29, 2007
		BY: Joe Dietrich
		REVISION: 0



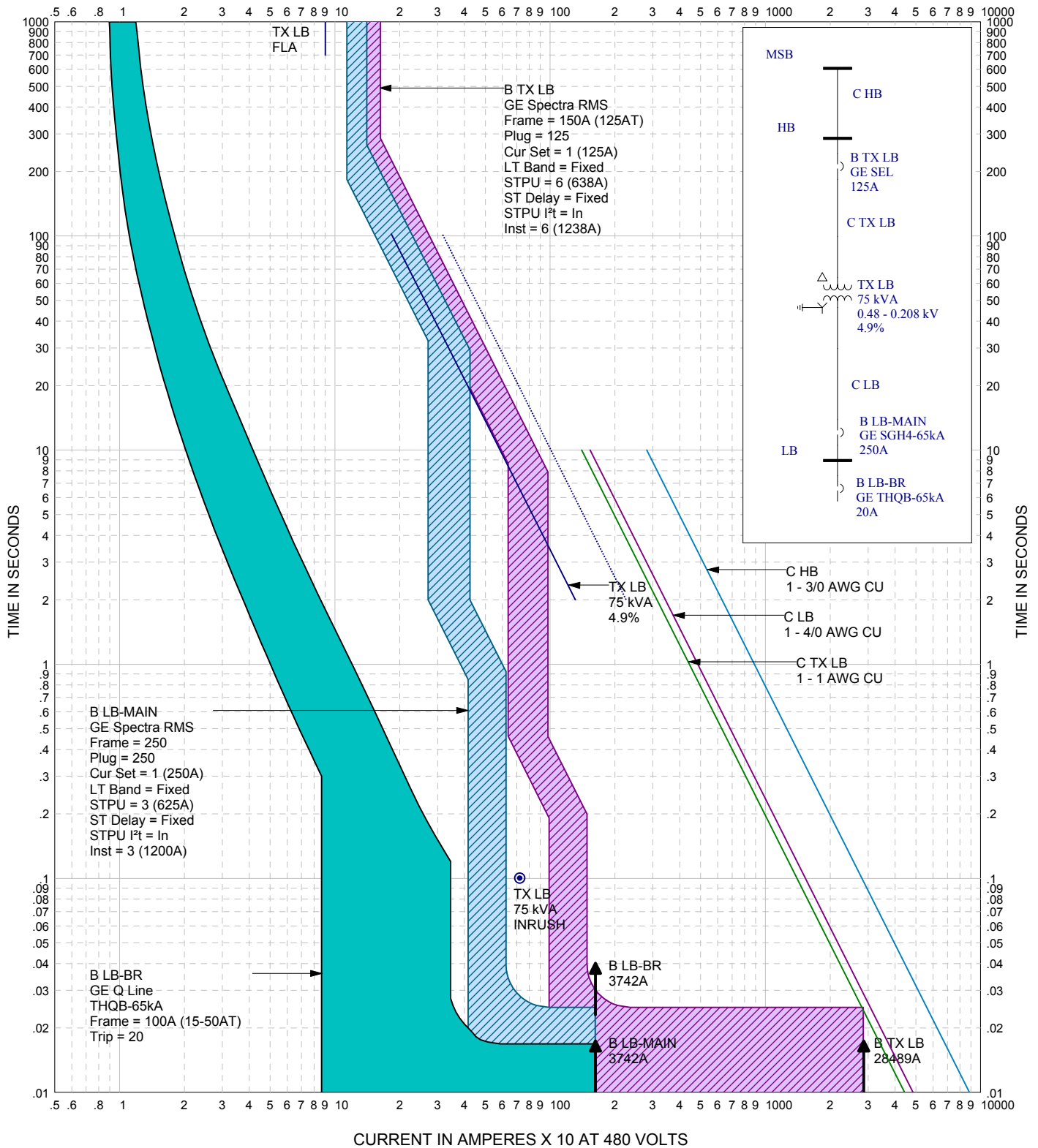
PQTSi	EasyPower [®] TIME-CURRENT CURVES	Tx DIM
KTNV		FAULT: Ground
Breaker Settings: SES-Main Disc, Feeder TX DIM		DATE: Jan 24, 2007
		BY: Joe Dietrich
		REVISION: 0

CURRENT IN AMPERES X 10 AT 480 VOLTS



PQTSi	EasyPower® TIME-CURRENT CURVES	Tx LX
KTNV		FAULT: Phase
Breaker Settings: Feeder Tx LX, LX-Main, LX-Branch		DATE: Jan 24, 2007
		BY: Joe Dietrich
		REVISION: 0

CURRENT IN AMPERES X 10 AT 480 VOLTS



PQTSi	EasyPower [®] TIME-CURRENT CURVES	Tx LB
KTNV		FAULT: Phase
Breaker Settings: Feeder Tx LB, LB-Main, LB-Branch		DATE: Jan 24, 2007
		BY: Joe Dietrich
		REVISION: 0